OPERATIONS AND MAINTENANCE PLAN
AND
RESPIRATORY PROTECTION PLAN
FOR ASBESTOS RELATED ACTIVITIES
AT UNIVERSITY FACILITIES

AUGUST 25, 1997
# Asbestos Operations and Maintenance Plan

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1 Introduction

This Asbestos Operations and Maintenance (O&M) Plan is written to coordinate with the current on-going identification and inspection of asbestos containing materials located on the campus of Midwestern State University. The O&M Plan is written as an instructional aid and compliance guide for maintaining the identified asbestos containing materials in the building structures while accommodating everyday operations and maintenance requirements of the campus. The words "Designated Person" is used throughout this report. This person has been assigned to oversee the implementation of the O&M Plan. The Designated Person has received asbestos training from an EPA approved training facility prior to implementing the O&M Plan. All work practices described in this O&M Plan that require the disturbance of asbestos containing materials, must be performed by individuals who have received asbestos training and have been licensed by the Texas Department of Health, in the appropriate asbestos discipline.

2 General Procedures / Assignment and Duties of the Designated Person

All references in this O&M Plan, to Designated Person refer to the person designated to manage Asbestos activities. The Designated Person for the Asbestos Operations and Management Plan (O&M), is L.F. (Flint) Skaggs, Environmental Safety Coordinator. Mr. Skaggs is licensed with the State of Texas, Department of Health, Division of Occupational Health, Asbestos Programs as an Individual Asbestos Consultant, License number 10-5110.

2.1 Designated Person General Responsibilities:

The Designated Person shall review work practices with the supervisors and workers who will perform the O&M work. Supervisors and workers shall consult with the Designated Person if they have any questions during the work, if any problems occur, or if it appears to the workers that additional precautions might be necessary to safely perform the work. This section includes detailed procedures for steps that are common to many of the work practices. The general procedures shall be covered in O&M training related to the use of this plan. Not all of the general procedures are used in every work operation. The work practices refer the user to applicable general procedures for detailed information on how to perform a certain portion of the work. Once a user is familiar with the general procedure requirements, it might not be necessary to review the general procedures each time an O&M activity is performed. However, the general procedures should be reviewed periodically by the Designated Person to verify that the proper procedures are being followed.

2.2 Adoption By Reference

The following regulations and guidance documents are adopted as references and guidelines as part of the Operations and Maintenance Plan (O&M), though not contained fully herein. The persons or parties involved with this program will comply with said documents in full as much as possible and as they are applicable or required by current law.

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3. EPA regulation §40 CFR 763 Subpart E 763.80-763.99, and Appendices A and B, titled, "Asbestos Containing Materials in Schools" (AHERA rules) 7/1/92


5. EPA regulation §40 CFR 763 Subpart E, Appendix B, titled, "Work Practices and Engineering Controls for Small-Scale, Short Duration Operations Maintenance and Repair (O&M) Activities Involving ACM" 7/1/92

6. EPA regulation §40 CFR 763 Subpart E, Appendix D, titled, "Transport and Disposal of Asbestos Waste" 7/1/92

7. EPA regulation §40 CFR 763 Subpart F, Appendix A, Section 1, titled, "Polarized Light Microscopy" 7/1/92


11. U. S. Department of Transportation regulation §49 CFR Chapter 1, Part 172, Appendix A, Subchapter C, 10/1/92

12. U. S. Department of Transportation regulation §49 CFR Chapter 1, Part 172, Appendix A, Subpart H, 10/1/92

13. TAC §295.31- §295.71, titled "Texas Asbestos Health Protection Rules" 9/15/94

14. EPA publication entitled "Guidance for Controlling Asbestos Containing Materials in Buildings"

15. EPA "Green Book" for Operations and Maintenance activities.

16. Resilient Floor Covering Institute publication titled, "Recommended Work Practices for the Removal of Resilient Floor Coverings"

17. All State and / or Local regulatory material that may pertain to this project are required to be maintained on job site and in the Environmental Safety Office, located at MSU Campus, Daniel Building, Room 106.

2.3 Work Control

The Designated Person shall develop a system to control all work that could disturb known or suspect ACM. Supervisors and shop foremen will notify the Designated Person Prior to initiating work on a known or suspect asbestos containing material. This control shall be achieved using a "work order" program, which requires the person requesting the work to submit a job request form to the Designated Person before work can be performed. The request form shall include the location of work and type of work needed to be performed. The Designated Person shall verify whether ACM will be disturbed, during the work. If ACM will be disturbed then the Designated Person shall
either have the ACM removed prior to the work or postpone the work until the ACM can be removed. The Designated Person shall design a specific work requirement document for each Asbestos O&M work order issued. If ACM is not expected to be disturbed by the work then the Designated Person shall approve the work order to proceed as a non-asbestos operations. Appropriate cautions and notifications shall be made.

2.4 Selection Of Personal Protective Equipment & Decontamination Procedures
Selecting personal protective equipment (PPE) for O&M work includes the selection of respirators, protective clothing, gloves, boots, hard-hats, and/or other equipment that might be necessary for a specific task. The Designated Person and the specific operation supervisor will designate the appropriate safety equipment that will be required during each O&M activity prior to the start of said activity. Decontamination procedures will be defined for each work site. The determining factors will be location of material, type of material, duration of project, type of work to be conducted and facility characteristics. The determination of these will be included in the documentation of each O&M activity.

2.5 Work Scheduling
As much as possible, asbestos activities work will be scheduled for a time when the work area will not be in use and can be closed off to anyone other than trained workers, or other authorized personnel. If an area is always occupied, plans will be made to isolate the work area from building occupants using visual and/or physical barriers. If a special work area arrangement is required, it might be beneficial to provide a sketch to the workers showing how the area is to be set up. When respirators are used, it will be desirable to vacate the area to avoid concerns resulting from a worker in a respirator working within sight of unprotected workers/occupants. Scheduling of work might be affected by notification requirements. All notification requirements should be met before work is scheduled under certain circumstances, some emergency work can be performed prior to the filing of a notification. All of the work performed by the O&M response team will qualify under the annual O&M notification. The Designated Person and the O&M Supervisor will review applicable regulations and consult with federal, state and local regulatory agencies concerning notification requirements for emergency work.

2.6 Notification Of Building Occupants
The Designated Person should inform building workers, occupants, tenants and outside contractors about the location and physical condition of asbestos containing materials (ACM) that they might disturb. It must be stressed that disturbance of the material must be avoided. The Designated Person can inform building occupants about the presence of ACM by distributing written notices, posting signs or labels in a central location, where affected occupants can see them, and by holding awareness sessions. The methods used may depend on the type and location of the ACM and the number of people affected. In service or maintenance areas, (such as mechanical rooms) all ACM should be labeled using prominent warning signs. These labels should give information stating the presence of asbestos and warnings not to disturb the material. Information sessions should be held to reinforce and clarify written notices and signs and to provide an opportunity to answer questions. All employees or occupants likely to disturb ACM should be included in the notification program on a
continuing basis. All new employees should be informed of the presence of ACM, in their work area, as soon as they are employed. Persons who work in or occupy areas where ACM work will occur should be notified prior to the start of the work. Building occupants should be given information about the specific work to be performed, the work schedule, precautions being taken, what will be visible during the work, and that posted warning signs must be obeyed. A general notice to affected personnel might be more convenient than notifying these personnel each time work occurs.

2.7 Assigning Workers

Workers assigned to perform O&M work should have training and experience in the skills and techniques required for the type of work to be performed, training in applicable asbestos O&M procedures, the O&M plan for the facility, and site specific building conditions.

Workers will be chosen for the O&M program based upon their skills, knowledge of the maintenance activity to be conducted, training, physical ability to perform the required task while wearing personal protection equipment. Workers will be required to wear negative pressure respirators, climb ladders, stand on scaffolds, walk up stairs carrying weights in excess of 30 pounds. Another consideration for choosing a person for an O&M operation will be their availability. As the workers and supervisors for the O&M program are from other disciplines within the Physical Plant Operations, worker availability will need to be considered when planning an O&M operation. Availability will be determined prior to the O&M operation by the Designated person, O&M Abatement Supervisor and the worker's immediate supervisor. During an emergency O&M response, the O&M Program will take precedence over other duties except for personnel in critical positions during the emergency. This decision will be made by the Physical Plant Director or the immediate person in charge at the time of the incident. All emergency planning will be conferred with the Designated Person for this plan.

2.8 Developing An Air Monitoring Program And Assigning Air Monitoring Personnel

Note: This section is not intended as a substitute for a complete Air Monitoring Program that is needed for O&M work. This section notes air monitoring issues that the Designated Person needs to address for O&M work.

The Designated Person will bid portions or all of the air quality monitoring to an outside consulting company during the course of large scale O&M or ACM removal projects as required to avoid the "Conflict of Interest" clause of the Texas Asbestos Health Protection Act (TAHPA).

In most standard O&M activities, the required air monitoring will be conducted by the Designated Person or a person appointed by the Designated Person, with appropriate license and training. In either case the Air Monitoring Program will be designed and reviewed by the Designated Person. A specific monitoring scheme will be developed for each operation.
The Air Monitoring Program should specify when air monitoring will be performed, the types of monitoring (personnel, background, area, clearance, periodic, and/or initial), analysis methods, training requirements for monitoring personnel, and procedures for maintaining data from O&M activities, including any data required for OSHA historical data monitoring exemptions. Air monitoring data should be considered when selecting the type of respirators for activities that require respiratory protection.

Training requirements of the Air Monitoring Program include, a NIOSH air monitoring course, three day Texas Air Monitoring Technician course, industrial hygiene training or other equivalent and Texas State license as an Air Monitoring Technician or Individual Asbestos Consultant. Additional training for persons performing air monitoring work shall include hands-on training with the equipment to be used. Training for air monitoring that is currently available consists primarily of courses meeting the National Institute for Occupational Safety and Health (NIOSH) 582 requirements.

Air monitoring exemptions or requirements for a given work practice should be based on the Air Monitoring Program. Exposure monitoring is addressed in greater detail in the Air Monitoring Program and OSHA regulations. Review of the applicable standards in detail when developing air monitoring procedures for O&M work will be done.

2.9 Selection Of Materials

The Designated Person should be responsible for the selection of certain materials used for O&M activities. This plan will not attempt to give guidance on all materials needed for O&M work. Information of standard materials and general applicable policies are as follows:

* Polyethylene
* Lockdown encapsulants

Guidance on the selection of other materials should be obtained in training courses, operation design, personal preference, and reference materials, such as the National Institute of Building Sciences (NIBS) Guide Specifications for Asbestos Abatement and Asbestos Maintenance Work Practices.

**Polyethylene** Various thickness, colors and types of polyethylene are available. The most common thickness used for asbestos O&M related work are 4 mil and 6 mil (0.10 mm and 0.15 mm). O&M operations may use equal or greater thickness of polyethylene sheeting both in plain, reinforced, fire retardant, anti-static, clear or opaque as required by the operation. Fire retardant polyethylene will be used in high heat areas. However, some tests have shown only minimal differences in flame spread time between standard and fire retardant polyethylene. Anti-static polyethylene shall be used around equipment that is sensitive to static electricity.

**Lockdown Encapsulants** Lockdown encapsulants selected will be appropriate for the intended use. Use high temperature rated encapsulants for heating system components such as piping, boilers.
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& flues. Lockdown encapsulants should also be compatible with any replacement materials, such as new flooring adhesive. Compatibility should be verified prior to the start of work. Lockdown encapsulants are available in clear or colored mixtures. Clear mixtures should be used were a colored encapsulant would be objectionable for appearance reasons. Colored encapsulants should be used (where possible) with a color chosen to indicate that an area has been locked down. The color also allows a worker to see where encapsulant has been applied during the application. Colored encapsulant use will be determined in the future. The color chosen should be uniform throughout all operations.

2.10 Emergency Work and Dry Removal

O&M activities sometimes require that regulated asbestos O&M work be performed immediately to maintain operations and prevent other health or safety hazards. Emergency work is acknowledged in regulations and is permitted under certain conditions. The NESHAP regulations specify that a notification for ordered emergency renovation operations must be postmarked or delivered "as early as possible before, but not later than, the following working day" (see regulation for full text). In the event of an emergency operation that exceeds the definition of an O&M operation or exceeds the annually reported notification limits, an emergency notification number from the Texas Department of Health will be obtained.

Emergency work might involve activities (such as work around activated electrical equipment) where the use of wetting would result in equipment damage or a safety hazard. NESHAP permits work without wetting regulated ACM under certain conditions (see regulation for details). For facilities where dry removal work might be required, the Designated Person should review regulatory requirements in advance with authorities having jurisdiction over the facility.

3 Worker General Procedures

This section includes detailed procedures for steps that are common to many of the work practices. The general procedures should be reviewed in detail by all personnel using the work practices to determine applicability. If possible, the general procedures will be covered in O&M training related to the use of this plan. The work practices and checklists refer the user to applicable general procedures for detailed information on how to perform a certain portion of the work. Once a user is familiar with the general procedure requirements, it might not be necessary to review the general procedures each time an O&M activity is performed. However, the general procedures should be reviewed periodically by all supervisors, workers and the Designated Person to verify that the proper procedures are being followed. Workers should report any suggestions or problems regarding these work practices to their supervisor, the Designated Person or the Designated O&M Supervisor.

3.1 Tools, Equipment and Materials

The following is a list of tools, equipment and materials that are referenced in the work practices and are recommended to perform the work practices. For O&M work, there will be a maintained
O&M cart or locker containing the necessary tools, equipment and materials for use solely on O&M operations. After each use of the equipment, the inventory is to be checked and the locker restocked.

**Tools and Equipment** (minimum stock)

6) Utility knife

4) Ground fault circuit interrupters (GFCI's), pigtails or a portable panel (GFCI will be used at anytime electrical equipment is used)

4) 50 ft. or longer Extension cords and adapters

6) Lockout tags as applicable for Elec., Gas, Steam, etc..

Temporary work lights (2) small lights (1) light stand

2) 8' folding, fiberglass ladders, (1) small scaffold for elevated work (these and other elevation equipment may be used from other Departments on an as needed basis) Cleaning clothes for wet wiping and (2) water buckets

1) Smoke test bulb and tubes kit - irritate and non-irrate smoke tubes

4) Diagonal Wire cutters - various sizes

3) Tin snips - Left, Right & Universal

6) Safety glasses / goggles

6) 100 ft x 20 ft. rolls Polyethylene sheeting (2) 4 mil, (2) 6 mil, (1) 6 mil Fire Retardant,

1) 6 mil anti-static

2) Cases of Duct tape (1) 2" wide (1) 3" wide

2) Rolls Disposal bags with generator labels (made for each job)

2) High efficiency particulate air (HEPA) vacuum with hose, attachments and proper HEPA filter (wet/dry type needed for some work practices) (1) large canister (1) glovebag unit

10) Respirators (6) half face, (4) Full face PAPR (if required) with appropriate filters

4) Cases of Disposable coveralls w/head & foot coverage (2) Large (2) X-large (if required)

2) Rolls of "Danger Asbestos Removal" barrier tape

10) Danger signs, (5) English, (5) Spanish

1) Airless sprayer with appropriate tips and cleaning equipment

3) Garden sprayers (1) large (2) small

4) Gallons surfactant (2) general use (2) for amosite containing materials

2) Gallons encapsulant (1) liquid (1) paste (high temp)

Air monitoring equipment (as required)

3) Frame for mini-enclosure / decontamination Unit sections
3.2 Preparing Amended Water Or Removal Encapsulant

Amended water or removal encapsulant solutions are prepared by mixing a measured amount of surfactant or encapsulant with clean water in accordance with the manufacturer's instructions. Some surfactants and encapsulants might be hazardous substances. Always consult accompanying Material Safety Data Sheet (MSDS) sheets for all products before use or application. All sprayers and containers of amended water or removal encapsulant should properly be labeled to identify the contents in accordance with the OSHA Hazard Communication Standard (§29 CFR 1910.1200). Review and comply with MSDS before mixing and using these materials. Amended water or removal encapsulant should be mixed in a labeled garden sprayer unit prior to the start of an O&M activity. The remaining amounts of mixed amended water and encapsulant should be properly stored or disposed of in a manner that complies with manufacture instructions. These materials should not be stored in the sprayer units. Sprayer units are to be properly cleaned and stored after each use.

3.3 Shut-Off And Lockout Of H V A C And Electrical Systems

Any electrical systems that might be worked on or affected by O&M activities should be shut off, locked and tagged with electrical lockout tags at the circuit breaker panel or disconnect switch. Affected systems include systems that could create electrical hazards during O&M activities that involve wetting.

HVAC systems in a work area, systems that serve a work area, or systems that will be worked on should be shut down during O&M activities. Any air-handling systems (supply, return and exhaust) required to be shut down should be shut off, locked, and tagged with electrical lockout tags at the circuit breaker panel or disconnect switch. 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.

3.4 Securing Work Area

When asbestos fibers might be released, work areas should be vacated and secured (where feasible) by scheduling, locking doors (from inside the area if possible) or other means and by installing polyethylene critical barriers over all openings into the work area. If this is not feasible, access to the work area should be restricted, such as by asbestos barrier tape around the perimeter of the work area. If barrier tape is used to denote a work area, it should be placed 5 to 10 feet (1.5 to 3 meters) outside of any polyethylene protection used in the work area. Install barrier tape by taping or tying it to fixed objects. Do not block access to any emergency exits, and when asbestos fibers might be released, post OSHA required "Danger Asbestos" signs at all entrances to the work area. For such
3.5 Putting On Respirators And Performing Fit Tests

The procedures described below are based on the assumption that workers wearing respirators have been trained in the use of respirators and, for negative pressure respirators, fit tested, and enrolled in a medical surveillance program as part of a Respiratory Protection Program. Respirators used should be approved by NIOSH and/or MSHA. These procedures are not a substitute for a Respiratory Protection Program in accordance with OSHA standard §29 CFR 1910.134 or regulatory requirements regarding respirators. The Respiratory Protection Program for Asbestos Related Activities is found in Section 10 of this document. Respiratory protection requirements for other than Asbestos O&M procedures are discussed in the complete Respiratory Protection Program which is maintained in the Environmental Safety Office.

3.5.1 Inspection of Respirator: Wearers should inspect their respirators before each use of the respirator. Respirators must not be damaged, have missing parts or be deformed in any way. The straps must be intact and well attached. Proper filter cartridges for the hazards to be encountered must be installed. Verify that filters have been replaced in accordance with the Respiratory Protection Program. Batteries for powered respirators should be fully charged. The respirator should also be cleaned if it was not cleaned after the last use. If any problems exist, the respirator should be repaired or replaced in accordance with the Respiratory Protection Program.

3.5.2 Donning of Respirator: When putting on a respirator, the straps should be loosened before it is put on. Filter caps (such as those used on some Powered Air Purifying Respirators) should be taped to the filter body or stored where it will not be lost. Powered respirators should be turned on and flow checked before the facepiece is put on. The respirator should be put on and then the straps tightened as recommended in the manufacturer's information provided with the respirator. Fit checks should then be performed.

3.5.3 Fit Checks: Fit checks should be performed in accordance with the Respiratory Protection Program by each worker each time they put on a respirator. Both positive and negative pressure fit checks should be performed. When feasible, powered respirators should be checked with the motor unit turned off. A negative pressure fit check is done by donning the respirator and pulling the respirator straps so the unit fits snugly. Inhale gently while placing hands over filters to block off inhalation side. Respirator should pull to face and no air should leak in around face seal.

A positive pressure fit check is done by exhaling gently (without breaking respirator seal to face) breathing normally while blocking of the exhalation valve. The face piece should then expand away from face while exhaling. Adjust respirator straps as needed to obtain
a good seal of the facepiece to the face. If a good seal cannot be obtained, obtain a new respirator and perform fit tests again.

3.6 Putting On Protective Clothing:
Protective clothing for workers typically consists of disposable coveralls, gloves and boots. Coveralls should have hoods and booties attached. They should provide complete coverage of the body with the exception of hands and face. Do not modify coveralls.

Protective Clothing Options Available for O&M Work Include: If potential for exposure to asbestos-containing dust and debris is low and localized, use:
1. One disposable coverall with no street clothes, or
2. Two disposable coveralls over street clothes.

If potential for exposure to asbestos-containing dust and debris is moderate or dispersed, use:
1. Two disposable coveralls with no street clothes, or
2. Two Tyvex® disposable coveralls over street clothes.

If street clothes could become contaminated, the street clothes shall be removed before the start of work. When possible, street clothes should be removed in a changing area before protective clothing is put on. Protective clothing should be put on after respirators. The coverall hood should cover respirator straps.

Workers are encouraged to wear protective gloves that are duct taped at the cuffs to the protective coveralls. Eye, hearing, and head protection should also be used where needed. Steel toe, steel shank rubber slip-resistant boots are to be assigned to each team member. These boots are to be maintained and worn during all O&M asbestos disturbance activities. Do not use coveralls with loose foot coverings or with foot coverings over boots. These practices can increase trip and fall dangers when climbing ladders or working on scaffold.

3.7 Beginning & Conducting Air Monitoring

Note: This section is not intended as a substitute for a complete Air Monitoring Program and specific protocols needed for O&M work. This section notes air monitoring issues that need to be addressed by the Designated Person.

Air monitoring during O&M activities can consist of personal monitoring, area monitoring and clearance monitoring. Air monitoring required for the work practice being performed should be listed on the Maintenance Work Authorization Form and be conducted in accordance with applicable regulations (such as §29 CFR 1926.1101 Appendix A), the O&M Plan and Air Monitoring Program. All air monitoring work should be conducted by a trained air monitoring person assigned by the Designated Person. The air monitoring person should calibrate, adjust, and record the flow rate of all air monitoring pumps to be used before air monitoring is started for an O&M activity.
**Personal Monitoring** To perform personal monitoring, attach a personal air monitoring pump to a belt worn by the worker. Attach an air sampling cassette to the hose from the pump. Route the hose up the worker's back and tape the hose to the workers protective coveralls using duct tape. The cassette should be located with the open end facing downwards at approximately a forty-five degree angle in the worker's "breathing zone" at about collar level. Turn the pump on and record start time and flow rate. The air monitoring person will retrieve or change the cassette when necessary, or when work is completed again recording the stop time and the flow rate.

**Area Monitoring** Area monitoring is usually performed using high volume air sampling pumps. Place pumps inside the work area and outside the work area in occupied areas or areas where occupants could be exposed if fibers are released from the work area. Pumps should be located where they obtain meaningful measurements of potential worker exposure during monitoring. Attach sampling cassettes to the hoses from the pumps and attach the cassettes to the top of tripod stands or other stable structures (but not the pumps themselves) to locate the sample at four to five feet (1.2 to 1.5 meters) above the floor. These cassettes should be located with the open end facing downwards at approximately a forty-five degree angle. The air monitoring person will retrieve or change cassettes as needed or when the work is completed. If any samples analyzed during the work exceed regulatory standards, work shall be stopped, the area cleaned and additional engineering controls implemented, as necessary.

### 3.8 Precleaning Work Area And Wet Wiping

Precleaning of work areas prior to the start of work is done to remove accumulated debris that could be disturbed during the work. Precleaning might include picking up dust and debris with a HEPA vacuum, wet wiping non-porous surfaces, HEPA vacuuming surfaces that cannot be wet wiped, and cleaning any carpeted surfaces using steam extraction equipment. Precleaning might reduce the extent of cleaning required after the work and for clearances (if required).

**Wet Wiping** The procedures to be used for wet wiping are as follows:

1. Immerse disposable towel in bucket containing amended water.
2. Wring out towel and fold into quarters.
3. Wipe surface and refold to have a clean face exposed. Do not place towel back into bucket or water will become contaminated and will need to be replaced.
4. Repeat step 3 until all faces of towel have been used. Obtain a clean towel if more wiping is needed.
5. Dispose of used towels in disposal bags.
6. Dispose of contaminated water as required by applicable regulations - See **Waste Water Disposal**

**HEPA Vacuuming** The procedures to be used for HEPA vacuuming are as follows:
1. For floors, use a floor attachment with rubber floor seals and adjustable floor-to-attachment height. For furniture, fabrics or other surfaces use an upholstery attachment or brush attachment.

2. Vacuum hard or smooth surfaces with attachment about 1/16" (2 mm) above the surface.

3. Vacuum carpet or fabrics with attachment just touching the surface.

4. Vacuum all surfaces in parallel passes with each pass overlapping the previous one by one-half the width of the attachment.

5. Once surfaces are cleaned in one direction, clean a second time at right angles to the first cleaning.

6. Use crevice brush or other tools to clean irregularly shaped surfaces.

Steam Cleaning Carpet  The procedures to be used for steam cleaning carpet are as follows:

1. Steam clean carpet using carpet tool.

2. Steam clean all surfaces in parallel passes with each pass overlapping the previous one by one-half the width of the attachment.

3. Once surfaces are cleaned in one direction, clean a second time at right angles to the first cleaning.

4. Water from cleaning process should be treated in accordance with applicable regulations - Waste Water Disposal.

3.9 Setting Up Work Areas

Note: Polyethylene work area protection is not to be used in place of other engineering controls and good work practices. Work practices such as wetting ACM, careful handling, local collection by HEPA vacuum and local exhaust ventilation should be the primary means of fiber control during O&M work. Polyethylene protection, glovebags, and mini-enclosures are intended as a secondary means of protection during the work. The NIBS Asbestos Abatement and Management in Buildings: Model Guide Specifications Section "Regulated Areas" provides information on the preparation of "a regulated area" for small scale, short duration work. “Small-Scale Short-Duration Work” section of the NIBS specifications provides information on the set up of a mini-enclosure. Review of this additional information is encouraged.

Preparation of work areas for O&M activities typically involves the use of a polyethylene drop cloths or mini-enclosure. Other techniques, such as the use of a glovebag taped over a self-supporting framework might also be used as a substitute for the specified methods where appropriate. For small amounts of removal work (such as several floor tile or cutting a hole in asbestos-containing drywall) where an enclosure is desired or needed, a glovebag can often be used in lieu of a full mini-enclosure.

Polyethylene Drop Cloth  Preparing a work area with a drop cloth requires that a single layer of 4 mil or thicker polyethylene sheeting be spread on the floor of the work area and taped or weighted in place. Do not use more than one layer if ladders (or similar equipment) will be used, unless a hard surface, such as plywood is laid over the drop cloth. If floor is a soft material, such as carpet, use...
caution to prevent tearing of polyethylene under equipment. The drop cloth should cover an area large enough to catch falling debris. If work is to be performed at an elevated level, the drop cloth should be placed on the work platform, or extended at ground level beyond the immediate work location to catch any debris that might be generated. (Note that the use of a drop cloth introduces potential slip hazards in the work area. Non-slip foot coverings are recommended where drop cloths are used.)

**Mini-Enclosure** A mini-enclosure is usually a polyethylene enclosure around a work area. Mini-enclosures are sealed enclosures used as a secondary means to help, or attempt to, contain fibers or debris generated during the work. Mini-enclosures also serve to provide a visual barrier between the workers and any other personnel around the work area. As noted above, careful work practices should be the primary means of fiber control during the work in order to prevent gross contamination of the mini-enclosure.

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 might be beneficial to construct or purchase a portable mini-enclosure unit that works for the typical conditions found in a given facility.

It is recommended that two workers be used to set up and operate 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 one person to work inside. The minimum width and depth of the enclosure should be at least 3 feet (1 meter). The dimensions may be greater if a folding ladder is used inside the unit. 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 time. A mini-enclosure shall 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 used to support polyethylene. A room can be enclosed for O&M work by installing critical barriers, one layer of 4 mil polyethylene sheet on the walls and two layers of 6 mil polyethylene sheeting floor of the room. *(Reminder: TDH O&M Contractor Restricted License: limits work to: Cleaning of areas and / or removal of ≤3 Sq. Ft. or ≤ 10 linear feet, where asbestos removal is not the purpose of the operation.)*
If the work to be performed is in 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. Refer to OSHA regulations §29 CFR 1910.28 and §29 CFR 1926.451 concerning scaffold requirements. Any ladders and/or scaffolds used must be built and used in conformance with the OSHA construction standards, and applicable state and local standards.

Cover the floor and the framework for the enclosure and change room with one layer of polyethylene attached using duct tape. A second layer of polyethylene laid on the floor might facilitate clean up work, or reduce the possibility of tearing the polyethylene if equipment is used (do not use two layers under the legs of ladders without additional surface preparation). 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 as 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. If work 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:

1. If ACM cannot be contacted, the enclosure should be separated from the ceiling by a narrow space.
2. If ACM 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.

After enclosure is in place, check for, and clean up any debris generated by enclosure installation.

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 Designated Person should review applicable patent information regarding use of these systems. This plan 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 provided by a High Efficiency Particulate Air (HEPA) filtered vacuum or by negative pressure machines, depending upon the size of the enclosure. The NIBS Asbestos Abatement and Management in Buildings: Model Guide Specifications Section "Temporary Pressure Differential & Air Circulation System" gives guidance on pressure differential systems and suggested rates of air circulation in terms of air changes per hour. A HEPA vacuum will usually provide sufficient negative pressure for a small enclosure. Larger enclosures might require a small negative pressure machine (HEPA filtered fan unit) 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 from 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 if possible. However, most vacuum units do not provide a connection for an exhaust duct, and are commonly exhausted to the inside. **A HEPA vacuum unit that has ever been used inside a removal enclosure work area may not be used for a local exhaust unit, except on exterior of building applications.** If a HEPA vacuum is used as the local exhaust unit for a mini enclosure, an additional unit must be used for vacuuming requirements of the operation. The exhaust unit is not to be used for vacuuming, during the operation. Only units with no debris in the canister and new filters installed may be used as local exhaust units. Additional protection might be desirable 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 HEPA 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.

### 3.10 Packaging And Labeling Waste

Asbestos-containing waste material from O&M activities should be adequately wet in accordance with the NESHAP requirements (§40 CFR 61.150). Verify waste packaging and other waste disposal requirements with the landfill that will receive the asbestos waste. Pre-labeled asbestos disposal bags should be used for asbestos waste disposal where possible, appropriate and permissible. Disposal bags should be collapsed by evacuating the air from the bag with a HEPA vacuum in the work area or enclosure. Once collapsed, twist the bag to form a neck and wrap it...
tight with duct tape. Fold neck of bag over to form a loop, then again wrap duct tape around neck and loop.

Place asbestos waste bag into second disposal bag and seal as described above. Label disposal bags as required by applicable NESHAP, OSHA and DOT regulations.

Asbestos waste that does not fit into disposal bags should be wrapped leak-tight in two layers of 6 mil (0.15 mm) polyethylene sheet. Each layer should be sealed tightly with spray adhesive and duct tape. Label outer layer as required by regulations.

Sharp objects that might puncture polyethylene (such as floor tile) should be placed into cardboard boxes or drums before wrapping in two layers of 6 mil (0.15 mm) polyethylene.

All waste should be labeled as required by federal, state and local regulations. Federal regulations requiring labeling of waste include OSHA regulations §29 CFR 1910.1200, 1910.1001 and 1926.58, EPA's NESHAP regulation §40 CFR 61.150, 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 properly marked and labeled.

Labels Requirements Include:
OSHA §29 CFR 1 926.58(k)(2) requirement:

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

Department of Transportation DOT requirement DOT's shipping paper and marking format, used with some exceptions is:
1. **RQ**, (Reportable Quantity, if over 1 lb (.4 kg) friable asbestos)
2. **ASBESTOS** (Shipping name; asbestos descriptions; see below)
3. **NA2212** (United Nations Identification numbers for the DOT asbestos descriptions)
4. **DOT Placard**

DOT defines chrysotile, actinolite, anthophyllite and tremolite asbestos as "white asbestos," crocidolite asbestos as "blue asbestos," and amosite as "brown asbestos." Yet all are reported as ASBESTOS

NESHAP requirement NESHAP requires that readily visible and legible warning labels as specified by OSHA under §29 CFR 1910.1001(1)(2) or 1926.58 (k)(2)(iii) be used on waste containers or wrapped materials (this is the same as the OSHA §29 CFR 1926.58 label listed above). Waste material to be transported off the facility site must also be labeled with the name of the waste generator and the location at which the waste was generated. Disposal labels will be
provided by the Designated Person for each operation. All labels will contain the following information:

1. Building Owner: Midwestern State University, 3410 Taft Blvd., Wichita Falls, TX  76308
2. Building Name and Location: (Name & Address or Campus)
3. Contractor Name: Midwestern State University, Physical Plant (except for outside contractor)
4. Date of Operation:
5. Project Number: (assigned by Designated Person)

3.11 Applying Lockdown Encapsulant

A lockdown encapsulant should be applied to areas where ACM is removed. Lockdown encapsulants used should be tested per 1978 Baneile/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.

Lockdown encapsulant needs to 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.

Lockdown is typically applied for O&M work using a garden sprayer. It should be applied in accordance with the manufacturers’ recommendations in two light coats sprayed from opposite directions to seal all portions of surfaces including any exposed edges of remaining ACM.

3.12 Cleaning Tools, Equipment, And Work Area

Clean tools and equipment using HEPA vacuuming and/or wet wiping procedures. Special attention should be given to cleaning extension cords, equipment wheels, vacuum hoses and other items that could pick up debris during the work. Tools and equipment should be placed outside of the work area as soon as cleaning is completed. Drop cloths and mini-enclosures can be cleaned and disposed of as ACM. Any items that cannot be fully cleaned (such as boots or tools) that might be used in another O&M activity will be placed into disposal bags, sealed and labeled as ACM. These bags should be wet wiped and then placed outside of the work area with the other tools and equipment. Do not open bags containing contaminated tools, or open equipment such as a HEPA vacuum, except during another O&M activity or in a designated work area. All contaminated tools and contained equipment will be properly labeled and stored in a locked area until it is required to be used again. HEPA vacuum hoses can be sealed with tape over both ends if the outside of the hose is clean. These hoses are to be stored in bags and clearly marked as ACM. These hoses are not to be used for any non-asbestos related activity or used with any vacuum except one equipped with HEPA filtration system.
Cleaning of the work area where an O&M activity is conducted consists of HEPA vacuuming and/or wet wiping (as appropriate) all surfaces in the area. HEPA vacuuming and wet wiping shall be performed as described in general procedure section 3.6.

3.13 Decontaminating Waste

Packaged waste should be HEPA vacummed and wet wiped before it is moved out of the work area. Use the wet wiping and HEPA vacuuming procedures in general procedure 3.6. Packaged waste should be placed on a sheet of polyethylene when it is moved outside of the work area. This polyethylene can be the outer portion of a drop cloth, if a drop cloth is being used.

3.14 Worker Decontamination And Removal Of Protective Clothing And Respirators

Removal of protective clothing (if used) decontamination and removal of protective clothing following O&M activities should use the applicable procedure(s) described below:

**Removal of Protective Clothing: When Drop Cloth Work Area Protection, or no Work Area Protection, Is Used (2 suits required);** HEPA vacuum all parts of outer protective clothing while standing at perimeter of drop cloth. Leaving respirator in place, remove protective clothing and fold inside out as it is removed. Place clothing, if contaminated, into a disposal bag and label as ACM waste. Fold drop cloth top side inward and place in waste bag. Repeat cleaning procedure for inner suit.

**Removal of Protective Clothing: If A Mini-Enclosure and Change Room is Provided, Remote Decontamination Unit;** HEPA vacuum all parts of protective clothing while inside work area enclosure. If two disposable coveralls are used, remove outer coveralls in work area while leaving respirator in place. Fold coveralls inside out as they are removed. Move to change room, HEPA vacuum protective clothing, and remove second set of coveralls in the same manner. If only one set of disposable coveralls is worn, remove in change room while leaving respirator in place. Fold coveralls inside out as they are removed. Place protective clothing, into a disposal bag and label as ACM waste. Wash hands, face and surface of respirator with clean water and disposable towels. Use caution to avoid breaking seal between respirator facepiece and face. Place disposable towels into a disposal bag. Remove respirator and follow procedures specified in Respiratory Protection Program for cleaning and storing respirator. Change respirator filters if needed or required and dispose of used filters as ACM. Put street clothes on and exit change room.

**Removal of Protective Clothing: If a Shower Is Available;** If a shower with waste water filtering for ACM is available, follow the applicable clothing removal procedure described above. Remove protective clothing in work area and put on a clean set of protective coveralls. Proceed to shower with respirator still in place. At shower facility, remove protective coveralls, folding inside out during removal. Place clothing, if contaminated, into a disposal bag and label as ACM waste. Shower completely, and remove and clean respirator while showering as described below.
Street Clothes: Street clothes are not to be worn during O&M activities. If street clothes are contaminated during any work activity, the street clothes should be HEPA vacuumed, removed during decontamination and placed into a labeled disposal bag. These street clothes should then be disposed of as ACM or taken to a facility that has equipment designed for cleaning asbestos contaminated clothing.

Removal of Respirator The procedures described below are based on the assumption that workers wearing respirators have been trained in the use of respirators and, for negative pressure respirators, fit tested, and enrolled in a medical surveillance program as part of a Respiratory Protection Program.

Remove respirator after removing protective clothing (if used). Before removing respirator, wash hands, face and surface of respirator with clean water and disposable towels. Use caution to avoid breaking seal between respirator facepiece and face. Avoid getting water into filter cartridges of respirator. Place disposable towels into a disposal bag. Remove respirator and follow procedures specified in Respiratory Protection Program for cleaning and storing respirator.

3.15 Visual Inspection And Completing Air Monitoring

Visual Inspection The Designated Person should develop building-specific protocols for visual inspections following O&M work. These procedures will be based upon the ASTM "Visual Inspection Practices For Asbestos Abatement Projects" E 1368-90. A visual inspection should be conducted prior to the completion of air sampling to verify that all visible dust or debris has been cleaned up. The person performing the inspection can be a worker. If the Designated Person or another person makes this inspection, they should wear the same type of personal protective equipment worn by the workers. If visible dust or debris remains, it must be cleaned up using wet wiping and/or HEPA vacuuming before clearance sampling is started. The EPA's Purple Book and the American Society for Testing and Materials (ASTM) "Standard Practice for Visual Inspection of Asbestos Abatement Projects (Document E1368-90) provide visual inspection procedures to be used in developing O&M inspection procedures.

Air Samples Complete air monitoring work in accordance with Air Monitoring Program and requirements noted on a Work Authorization Form. Verify that removal areas have been encapsulated ("locked down"), that the work area, tools, and equipment have been cleaned, and that the area has passed a visual inspection. When air sampling cassettes are retrieved, the air monitoring person should record the stop time for the samples and check and record the flow rate of the air monitoring pumps. Samples should be analyzed on-site (for PCM analysis) if possible, or sent to a laboratory for analysis. When sample results are received, compare results to Air Monitoring Program criteria for work release or clearance. If sample results exceed criteria, the work area should be recleaned, reinspected, and then additional air samples should be obtained. If samples are equal to or below release criteria, tear down work can proceed. Collect air sampling pumps and equipment from work area and other locations when air sampling work is completed.
3.16  Waste Transportation, Storage And Disposal

Transport asbestos waste from O&M activities to a designated storage area to be held. The disposal of most waste will be contracted to a licensed waste transporter. In some cases MSU response team may transport waste to an approved landfill. Workers transporting waste should follow Respiratory Protection Program recommendations concerning respirator requirements for transporting asbestos waste. Do not drag packaged waste. All waste should be lifted and carried, or transported in wheeled carts, when moved from one area to another. Packaged waste should be placed, not thrown or dropped, into vehicles, storage areas and the landfill.

Any asbestos waste that is not taken to a landfill shall be stored in a secure, lockable area. Signage in accordance with NESHAP should be posted at the storage area and on vehicles used to transport asbestos containing waste material during loading and unloading. When asbestos waste in the storage area is taken to a landfill, it should be transported in accordance with all applicable federal, state and local regulations. Asbestos waste shipment records should be completed in accordance with the requirements in NESHAP §40 CFR 61.150.

3.17  Glovebag Removal

(Also includes other types of prefabricated removal enclosures) Remove asbestos-containing material inside a glove bag according to the following procedures. Glovebags should be used only once and should not be moved to another location to perform additional removal work, or reused in any way. Glovebags are available in many different sizes, shapes and configurations to accommodate the variety of removal situations that might be encountered. Glovebags are available for use in horizontal, vertical or other special applications. Since standard glovebags will melt if used on surfaces over 120-150 degrees Fahrenheit (50-65 degrees Celsius), special types of glovebags are available for use on high temperature piping or other surfaces.

Other types of prefabricated removal enclosures include "glovebox" type enclosures, multiple glovebag assemblies, glovebags with self-supporting frames, and glovebags that funnel waste into standard disposal bags. Check with equipment suppliers for information on these enclosures and applicability prior to use.

Glovebags might be used with a framework for O&M work on flat areas such as surfacing materials. Note that significant asbestos exposures to workers can result from the improper use of glovebags. Workers should obtain information on current regulatory requirements on glovebag use from the Designated Person.

Procedure A. Glovebag Removal Procedures:

1. Check area where the work will be performed. If damaged ACM is present (broken lagging, hanging, etc.), wrap in polyethylene and cover polyethylene with strips of duct tape for
reinforcement. Place one layer of duct tape around the removal area where the glove bag will be attached. Also protect any damaged ACM outside the glovebag area that could be disturbed during the work.

2. Slit top of the glove bag open (if necessary) and cut down the sides to accommodate the removal area or pipe diameter. Place necessary tools into pouch located inside glove bag (or into a sleeve turned inside out). Tools needed typically include: scraper, bone saw, utility knife, disposable towels, nylon brush, abrasive pads, wire cutters, tin snips and pre-wetted lag cloth. Cut lag cloth to sizes needed to cover any ACM that will remain after glovebag work is completed. Place lag cloth in a sealed bag or folded section of polyethylene sheeting.

3. Place one strip of duct tape along the edge of the open top slit of glove bag for reinforcement.

4. Place the glove bag around removal area and staple top together. Make sure to staple through the duct tape reinforced edge of the glovebag. Provide 8-12 inches (200-300 mm) of space inside glovebag between removal surface and glovebag for working room. Secure glovebag to duct tape previously installed around removal area.

5. Use smoke tube and aspirator bulb to test seal. Place tube into water sleeve (two-inch [50 mm] opening to glove bag) squeezing bulb and filling bag with visible smoke. Remove Smoke tube and twist water sleeve closed. While holding the water sleeve tightly, gently squeeze glove bag and look for smoke leaking out, (especially at the top and ends of the glove bag). If leaks are found, tape closed using duct tape and retest.

6. If a negative pressure glovebag with a supporting framework and HEPA filtered makeup air port is being used, attach hose from an operating HEPA vacuum to glovebag to provide negative pressure in glovebag. Follow equipment manufacturer's instructions on use of negative pressure equipment.

7. Insert wand from garden sprayer with amended water through water sleeve. Seal sleeve around sprayer wand tightly with duct tape to prevent leakage.

8. Insert arms into glovebag sleeves.

9. Remove any metal jacketing or covering over the area where removal is required using tin snips and/or wire cutters. Fold in any sharp edges to avoid cutting the bag. Pierce any painted coverings to permit water to soak the ACM.

10. Adequately wet material to be worked on with amended water and allow to soak in. Wet adequately to penetrate and soak material through to substrate.

11. Cut insulation section to be removed using bone saw or utility knife. Use caution to avoid cutting glovebag. Lift glovebag away from cutting area if necessary. Throughout this process, spray amended water or removal encapsulant on the cutting area to keep dust to a minimum.

12. Remove insulation using scraper or other tools. Place pieces in bottom of bag without dropping. Rinse all tools with amended water inside the bag and place back into pouch or a sleeve of the glovebag turned inside out.

13. Using nylon brush, scrub pads, disposable towels and amended water, scrub and wipe down the removal area.
14. Seal exposed ACM around removal area using pre-wetted lag cloth or encapsulate with a bridging encapsulant. Encapsulate removal area with an appropriate lockdown encapsulant. Use suitable high temperature encapsulants for hot piping.

15. Wash down inside of glovebag with amended water and wipe as necessary to move all debris and residue to lower part of glovebag (below where bag will be twisted and cut).

16. Remove water wand from water sleeve, twist water sleeve closed and seal with duct tape.

17. From outside the bag, pull the tool pouch or sleeve away from the bag and twist pouch to seal it from rest of bag. Place duct tape tightly over the twisted portion and then cut the tool bag from the glove bag cutting through the twisted/taped section.

18. Contaminated tools might then be placed directly into another glove bag without cleaning. Alternatively tool pouch with the tools can be placed in a bucket of water, opened underwater, and tools cleaned and dried. Discard disposable towels and nylon brush with asbestos waste. Dispose of contaminated water as set forth in general procedure 3.16.

19. Evacuate air from glovebag using HEPA vacuum. With HEPA vacuum operating, move all insulation into the bottom of the bag, twist the bag several times and tape it to keep the material in the bottom during removal of the glove bag from the removal area. Slip a 6 mil (0.15 mm) disposal bag over the glove bag (still attached to removal area). With the hose of an operating HEPA vacuum inserted in the upper part of glovebag, remove tape or cut bag and open the top of the glove bag and fold it down into disposal bag.

Procedure B. Use of a Glovebag with Sell-Supporting Frame; Glovebags on self-supporting frames can be used for some O&M activities on surfacing materials, and might be able to be adapted for other types of ACM. The general procedures for using these units are as follows:

1. Construct a rectangular or square frame of 1 1/2" (38 mm) diameter PVC or ABS pipe. Supporting legs can be made of lengths of pipe and fittings as needed to achieve the required height. Proprietary frames with telescoping legs are available.

2. To install glovebag on the frame, fold top edge of bag over the frame sides and extend the open edge of the bag at least 10 inch (25 cm) beyond the frame. Secure the open edges to the rest of the bag using duct tape. Place tools and supplies needed (see glovebag procedure above) in tool pouch inside glovebag.

3. Place frame and glovebag assembly below work location so that frame is close to, but not touching ACM. The location and proximity of frame to ACM should allow for some movement without disturbing ACM during the work. Insert wand of garden sprayer with amended water into bag and seal in place.

4. Cut hole in glovebag for negative pressure equipment hose. Negative pressure equipment could be a HEPA vacuum or small HEPA equipped negative pressure machine. Install hose and seal in place. A prefilter might be needed to prevent any gross ACM debris from being drawn into the negative pressure device.

5. Install a hose from an operating HEPA vacuum into the bag in a position where it can be used during the work.
6. Turn on negative pressure device and smoke test all sides of glovebag frame unit to verify that negative pressure is present. If sufficient negative pressure is not present, reduce clearance between ACM and frame (if possible), or add additional negative pressure device(s).

7. Insert hands into glove arms and wet ACM where work is required. Perform work as needed. Caution: If bag is overloaded with tools or other materials, bag might break or release from frame.

8. HEPA vacuum and wet wipe tools and inside of bag. Adequately wet any ACM debris in glovebag.

9. Slowly lower frame to allow tools to be removed from bag.

10. Gently remove glovebag from frame and twist to form a neck. Evacuate air from bag using HEPA vacuum and tape bag closed.

11. Remove garden sprayer wand, negative pressure device hose, and HEPA vacuum hose and seal holes with duct tape.

12. Place glovebag into a labeled 6 mil (0.15 mm) asbestos disposal bag and seal bag.

3.18 Disposal Of Contaminated Water

Contaminated water from O&M activities should be disposed of in accordance with all applicable federal, state and local regulations. Filtering might be required. If filtering is required, water should typically be filtered through a maximum 5 micron (5 µm) water filter before discharging water into a sanitary sewer system, if permitted. If a filter unit is not available at the work location, contaminated water can be put into leak-tight drums and transported to a location with filtering equipment. If a portable shower unit with filtering equipment is available, contaminated water can be emptied into the shower and filtered through the shower filter system. All filters and cleaning materials used on the shower unit or the water filtration unit are to be disposed of as ACM.

4 Maintenance of Asbestos Containing Ceilings

1. No object shall be suspended, fastened, or otherwise attached to any ceiling that is known or assumed to be asbestos containing.

2. No renovation may be performed on any ceiling material known or assumed to contain asbestos, except to further enclose the asbestos containing materials, without any disturbance of the asbestos containing materials. If any remodeling or renovation is planned the asbestos containing materials must be removed by asbestos trained and licensed personnel. Any areas that are presently damaged or in the future become damaged shall be repaired immediately.

5 Maintenance of Asbestos Containing Floorings

1. Stripping of asbestos containing floorings will be limited to once a year using a water based stripper. Special attention should be given to assure that the flooring is always wet during stripping.

2. Double wet wiping will be performed after stripping of asbestos containing flooring, with frequent changes of mop bucket water.

6 Maintenance Of Asbestos Containing Thermal Pipe Insulation
6.1 All Thermal Systems Insulation Shall Be Maintained In An Undamaged And Intact State. Any Accidental Breach In The Thermal Insulation Wrap Shall Be Immediately Reported To The Designated Person So That It Can Be Repaired.

6.2 Repair Of Insulating Materials

6.2.1 Steam pipes, heaters, vent stacks, hot water storage tanks, and furnace boilers which are known or suspected to contain asbestos must be repaired using special procedures, approved for use with asbestos containing materials. These materials are of differing types; i.e., paper-like materials, canvas-like materials and chalky mixtures used on boilers, steam lines, and storage tanks. Where these types of materials are not covered by harder surfacing materials, they represent a potential for fiber release. It is the objective of the operations and maintenance program to identify and eliminate any areas where the insulating material has been damaged and exposed. All such exposed material is to be completely covered with a non-asbestos containing material that will prevent further damage to the insulation.

6.2.2 Minor damage to cloth lagging material installed over the insulation (e.g. tears, loose edges, or cracks between covering sections) can be repaired by covering them with duct tape. If such damage involves a continuous area more than one foot in length, the use of tape shall only be considered to be a temporary measure. Final repair shall be made by covering the area with a new piece of non-asbestos containing lagging or with a plastic or metal jacket.

6.2.3 Small deep holes in the insulation that are associated with the lagging damage are to be filled with non-asbestos containing bonding cement or synthetic resin material. Repairs to larger areas of the insulation (i.e. one square foot or more) may require special techniques.

6.2.4 Edges of the covered insulating materials that are left exposed at the ends (i.e. most frequently found in the vicinity of pipe fittings or valves) are also to be completely covered using a bonding cement or resin material that is suitable for the application.

7 Removal of Asbestos Containing Materials

1. Custodial and maintenance personnel shall not in any way break, damage or remove asbestos containing materials.

2. Any removal of asbestos containing materials, which is deemed necessary by the Designated Person will be performed by the asbestos control team or a licensed asbestos abatement contractor.

8 Disposal of Asbestos Containing Waste Material

1. All asbestos containing material to be disposed of must be placed into asbestos hazard labeled 6 mil. disposable polyethylene bags. These bags are then sealed with duct tape and placed into another labeled bag and sealed again. These bags are then stored for proper disposal.
2. The Designated Person or a currently licensed state contractor will be responsible for the completion of the asbestos waste manifest and delivering the materials to an EPA approved landfill. The asbestos waste manifests are to be returned to the property owners Designated Person for inclusion into the O&M plan.

3. The manifest must indicate the name of the waste generator, the carrier, the receiver, the type of material, the amount and the time that deliveries were made.

9 Fiber Release Episode Reporting

In all areas that contain asbestos, precautions must be taken to minimize the disturbance of this material. If fiber release takes place where there is a release of asbestos fibers, further precautions must be taken for the building occupants. The Designated Person must be notified immediately and proceed to take appropriate action. The following are essential elements of asbestos control procedures:

9.1 Procedures

9.1.1 No person shall disturb asbestos unless the task is essential to the repair or maintenance of the building. The Designated Person shall coordinate all proposed repair and maintenance work and will use only personnel that have been trained in the appropriate asbestos discipline.

9.1.2 If an accident occurs that has resulted in the release of asbestos fibers, the Designated Person must immediately isolate the area, shut down the HVAC system to the effected area and coordinate all clean up and repair work. This work must be performed by the asbestos control team.

9.1.3 The Designated Person will take action to ensure that the release of asbestos fibers will be minimized by immediately isolating the damaged area and repairing the damaged item. All visible residue must be cleaned using wet methods and the entire isolated area cleaned and mopped.

9.1.4 The Designated Person shall take measures to see that areas containing friable asbestos are inaccessible to building occupants, and the general public, if at all possible.

9.1.5 Any structural damage, vandalism, roofing leaks, or other damage that involves asbestos containing materials encountered by the building's maintenance or custodial personnel must be immediately reported to the Designated Person. The Designated Person shall immediately take preventative action and issue a work order to repair the damaged area. When completed the Designated Person must write a detailed report and include a copy of the report in file for inclusion into the O&M plan.

9.1.6 The Designated Person is responsible for the scheduling and implementation of all required training and the use of trained personnel while implementing all properties of the Asbestos Containing Materials Operation and Maintenance plan.

1 Friable - can be crushed or pulverized by hand pressure.
9.2 Fiber Release Episode Notification

In fiber release episodes the maintenance and custodial personnel will immediately notify the Designated Person. The Designated Person will take immediate action to isolate the affected area and to shut off the HVAC systems servicing the affected area.

9.3 Fiber Release Documentation

The Designated Person shall document the following information on the provided fiber release reporting form:
Fiber Release Reporting Form

Note: Response actions other than isolating the affected area and shutting down the heating and air conditioning systems must be performed by a licensed asbestos abatement contractor or the Designated Person and the MSU asbestos control team.
10 Respirator Program

Respirators used for O&M activities must be selected based on the requirements of regulations and a Respiratory Protection Program developed in accordance with OSHA standard §29 CFR 1910.134 or the EPA "Worker Protection Rule" (§40 CFR 763.120,121), as applicable, for the O&M workers. Appendix 'E' of the Green Book includes EPA's recommendations on the types of respirators to be used for custodial and maintenance tasks. Liability concerns, historical data and management policies might also influence whether respirators are used, and if so, the type of respirators for O&M activities. NIOSH recommends minimizing occupational exposure to cancer producing substances, such as asbestos to the lowest feasible level. In practice, a maximum exposure level for workers of 0.01 fibers per cubic centimeter of air inside the respirator is commonly used when respirators are selected using protection factors.

OSHA has stated that the OSHA permissible exposure limit was selected as a technical and economic compromise for industry, and is not designed to totally prevent cancer causing exposures. The EPA's White Book contains information regarding respirator selection that might be helpful to the Designated Person. Review of this additional information is strongly encouraged.

In certain situations, full face respirators might be desirable to provide additional eye and face protection for workers. Powered Air Purifying Respirators (PAPR's) are preferred by many workers instead of negative pressure respirators. OSHA regulations §29 CFR 1910.1001 and §29 CFR 1926.58 require that an employer provide PAPR in lieu of a negative pressure respirator if an employee chooses to use this type of respirator and that the respirator will adequately protect the worker from the hazard.

Depending upon the type of work and work practices to be used, combination respirator filter cartridges or a different type of respirator might be necessary to protect workers from other contaminants or hazardous substances. Respiratory protection for asbestos work requires the use of high efficiency particulate air (HEPA) filter cartridges.

10.1 Scope Of Program

This respirator program only pertains to respirator use for protection against exposure to asbestos. Written standard procedures governing the selection and use of respirators should be maintained by the Designated Person. All employees performing work on nonfriable and friable asbestos containing materials shall wear (at minimum) half mask HEPA cartridge respirators. The cartridges must carry labels indicating the manufactures intended use and bear the wording "dusts, including asbestos". Respirators must be worn when performing any of the following tasks:

1. Removal of any friable or nonfriable asbestos containing material.

2. Any installation, repair, service or renovation activity which might disturb or dislodge asbestos containing materials.

3. Any activity that would include the partial or complete removal of any asbestos containing material.

10.2 Medical Surveillance Program
All asbestos control team members used for small scale activities involving asbestos containing materials must have current medical approval from the Doctor to wear a negative pressure respirator. Copies of all medical records must be maintained for 30 years. The Occupational Safety and Health Administration dictates (§29 CFR 1910 and 1926) that any person working with asbestos containing materials, and has a potential for exposure must be given a yearly physical. In accordance to §29 CFR 1910.1001 (l)(ii), this physical must include at a minimum:

1. A personal medical history with emphasis on pulmonary problems.
2. A satisfactory spirometer test for pulmonary function.
3. A chest roentgenogram of posterior and anterior views in 14 x 17 inch format.
4. A signed statement from the physician that the employee is capable of physically functioning while wearing a respirator. A written description of the work requirements of each person examined will be provided to the physician by the Designated Person.
5. The medical records for each employee must be current and must be maintained by the Designated Person.

10.3 Respirator Training And Fit Testing:
All asbestos control team members must receive respirator fit test training and review the respiratory protection plan requirements. This training and testing will be conducted every six months. The semi-annual training will include at a minimum:

1. Qualitative fit testing, utilizing the rainbow passage and variable movement during testing techniques will be used.
2. Respirator selection criteria
3. Respirator inspection techniques
4. Cleaning and disinfecting techniques
5. Proper respirator storage techniques
6. Respirator limitation and protection factors
7. The nature and the dangers of asbestos containing materials
8. Confined space entry protocol and other safety issues

10.4 Respirator Storage:
Respirators will be individually assigned to each asbestos control team member. Respirators will be clearly marked on the storage bag and the respirator. All respirators will be stored in a cabinet within the response team storage area. All response team supervisors and the Designated Person will have keys to gain access to this equipment at anytime it might be needed. Each team member is responsible for the proper storage of the respirator. All respirators are to be stored in a dry, clean polyethylene bag or other suitable air-tight storage device.
10.5 Respirator Cleaning And Disinfecting:
The proper cleaning of respirators must be performed after each use. These procedures will include:
1. Wash the respirator in a detergent solution.
2. Rinse the respirator clean with plain water.
3. Disinfect the respirator with a germicidal disinfectant.
4. Allow the respirator to air dry.
5. Store the respirator in the designated dry location.

10.6 Respirator Inspection:
Respirator inspection must take place before use and after the respirator has been cleaned, prior to storage. These items must be inspected:
1. The condition of the respirator facepiece: Cracks, tears, holes, distortion, dirt, broken or missing components (refer to manufacturer's documentation).
2. The headstraps: breaks, tears, loss of elasticity, broken or missing components (refer to manufacturer's documentation). Excessively worn serrations of the head harness which might allow the facepiece to slip.
3. Inhalation valve, exhalation valve and valve seats: Detergent residue, dust particles on valve or seat, cracks, tears, distortions, missing or defective covers.
4. Filter Media: proper filter for application, approval designation, missing or worn gaskets, worn threads, cracks, dents or holes in housing
5. PAPR batteries: are to be discharged prior to re-charging to prevent memory lock cycle in Ni-cad batteries
6. PAPR respirator connecting tubes and motors.

10.7 Respirator Approval
All respirators must be approved by the National Institute for Occupational Safety and Health (NIOSH). Each respirator must bear an approval stamp from NIOSH.

10.8 Designation Of Administrator:
The Designated Person, Flint Skaggs will be responsible for the administration of the respirator program. The Designated Person will review and modify the Respiratory Protection Plan on an annual basis. The Designated Person will inspect each of the asbestos control team's respirators on an semi-annual basis. The Designated Person must insure:
1. The purchase of properly sized and NIOSH approved respirators and replacements.
2. The purchase of HEPA respirator cartridges. These cartridges must bear labels indicating the manufactures intended use and bear the wording "dusts, including asbestos".
10.9 Special Conditions:

In accordance with the requirements stated in §29 CFR 1910.134 (e)(5), any personal factors that interfere with the proper fit of the respirator are not allowed. The items not allowed may include but are not limited to:

1. Beards, sideburns, or other body or facial hair that interferes with the fit of the respirator will not be allowed.
2. Glasses, safety goggles or other vision correcting or protection device that interfere with the proper seal of the respirator. Careful consideration and selection of equipment is required.
3. For personnel that wear corrective lenses and are required to wear full facepiece respirators on a regular basis; corrective lenses with permanent mounts within the respirator, will be provided. For personnel that require corrective lenses but are not required to wear full facepiece respirators on a regular basis; glasses with shorten temple bars or no temple bars will be taped to their face with medical tape for the duration of the operation.
4. Head coverings and any other item that the Designated Person may feel interferes with correct respirator fit.
5. The wearing of or application of makeup or any other compound on the face that might trap fibers or inhibit the proper fit of the respirator.

10.10 Fit Testing:

Each control team member will perform a qualitative fit test using smoke tubes on a semi-annual basis. Employees will perform both negative and positive pressure tests each time the respirator is put on.

The Designated Person as the respirator program administrator, will observe, document, and conduct the semi-annual fit testing.

10.11 Respirator Selection:

The Designated Person and the program supervisor will select the appropriate respirator for each work activity. The selection of the respirator will be based upon the potential hazards of the work area and the possible fiber concentrations in the worker's breathing zone during the activity. Determination of respiratory protection requirements will be based upon air monitoring information and work area conditions. The appropriate respirator will be selected from the following table. Currently, the O&M response team will not conduct any activity that might exceed the maximum concentration limit of 0.5 fibers per cubic centimeter.
### RECOMMENDED RESPIRATOR SELECTION FOR PROTECTION AGAINST AIRBORNE ASBESTOS

<table>
<thead>
<tr>
<th>RESPIRATOR</th>
<th>OSHA MAX CON</th>
<th>PF</th>
<th>NIOSH MAX CON</th>
<th>PF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Half Mask Air-purifying with HEPA filter</td>
<td>1 f/cc</td>
<td>10</td>
<td>0.1 f/cc</td>
<td>10</td>
</tr>
<tr>
<td>Full Facepiece Air-purifying 5 f/cc with HEPA filters</td>
<td>50</td>
<td>0.5 f/cc</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Powered Air-purifying (PAPR) Loose-fitting helmet of hood with HEPA filters</td>
<td>10 f/cc</td>
<td>100</td>
<td>0.25 f/cc</td>
<td>25</td>
</tr>
<tr>
<td>Powered Air-purifying (PAPR) Full facepiece, with HEPA filters</td>
<td>10 f/cc</td>
<td>100</td>
<td>0.5 f/cc</td>
<td>50</td>
</tr>
<tr>
<td>Supplied Air, Continuous Flow Loose-fitting helmet or hood</td>
<td>10 f/cc</td>
<td>100</td>
<td>0.25 f/cc</td>
<td>25</td>
</tr>
<tr>
<td>Supplied Air, Continuous Flow Full facepiece + HEPA escape</td>
<td>10 f/cc</td>
<td>100</td>
<td>0.5 f/cc</td>
<td>50</td>
</tr>
<tr>
<td>Full Facepiece Supplied Air 100 f/cc Pressure demand + HEPA Escape</td>
<td>1,000</td>
<td>10 f/cc</td>
<td>2,000</td>
<td></td>
</tr>
<tr>
<td>Full Facepiece Supplied Air &gt;100 f/cc Pressure Demand with Aux SCBA, Pressure Demand</td>
<td>&gt;1,000</td>
<td>&gt;10 f/cc</td>
<td>10,000</td>
<td></td>
</tr>
</tbody>
</table>

1. NIOSH Protection Factor - Best Practice
2. This value represents the maximum fiber concentration outside the respirator to maintain exposure inside the respirator below 0.01 fibers /cc. (It was calculated using the more conservative PF value between OSHA & NIOSH, assuming concentrations inside the mask = 0.01 f/cc)
or Continuous Flow
REPIRATOR FIT TEST FORM

EMPOLYEE NAME: __________________________________________________________

SOCIAL SECURITY DATE: ______________ DATE: _________________________

TEST METHOD: Irritant fume qualitative fit test as stated in §29 CFR 1926.58 Appendix C, section III
(Note: Test subject is to wear respirator approximately ten minutes prior to the start of the fit testing)

Respirator Brand: __________________________ Model: _______________________

NIOSH / MSHA Approval Num.: __________________________

<table>
<thead>
<tr>
<th>Coverage:</th>
<th>Halfmask</th>
<th>Fullface</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type:</td>
<td>APR</td>
<td>PAPR</td>
<td>Supplied Air</td>
</tr>
</tbody>
</table>

| Pressure Type: | Negative | Positive |

| Size: | Small | Medium | Large |

| Fit Checks: OK? | Positive | Negative |

(Each of the following are to be performed by the subject for one minute each, while respirator is challenged with fume.)

- Breathe Normally
- Move Head Side to Side
- Move Head Up and Down
- Read Rainbow Passage (Loud)
- Jog in Place
- Breathe Normally

Did the test subject exhibit difficulty in breathing?: Y/N ________

Comments: __________________________________________________________

Tested By: __________________________________________________________

Name __________________________ Signature __________________________
Asbestos Operations And Maintenance Plan

This test is to be conducted every six months or at anytime there is a weight change of more than 20 pounds or more, significant facial scarring in the area of the facepiece seal, significant dental changes, reconstructive surgery or cosmetic surgery, or any other condition that might interfere with the seal of the facepiece.

11 Protective Clothing & Decontamination Procedures

Protective clothing for O&M work typically consists of disposable coveralls, gloves and/or boots. Protective clothing for O&M work can be selected by the Designated Person or the worker, depending upon the O&M procedures. Protective clothing options that are typically used are discussed in Worker General Procedure. The protective clothing option selected might depend in part upon the decontamination procedures to be used and the type of work area preparation or enclosure.

Decontamination procedures typically used for O&M work include HEPA vacuuming on a drop cloth, changing in a change room, or showering. Worker General Procedure explains the decontamination process for each option. The Designated Person might also determine whether boots, gloves, hard-hats or other protective equipment is needed for O&M tasks. Protective clothing selections made by the Designated Person should be recorded on a Maintenance Work Authorization Form.

12 Training

All employees that may disturb asbestos containing materials in the normal pursuit of their employment must receive asbestos training by an EPA approved training facility. All awareness training will be conducted by the Designated Person.

1. All maintenance and custodial personnel that will be working directly with the repair, maintenance, or other small scale activities involving asbestos containing materials must receive asbestos training from an EPA approved facility and be currently licensed with the State of Texas for their position.

2. All of the maintenance and custodial personnel that will be working around asbestos containing materials and are not expected to disturb any asbestos containing materials will receive a 2 hour asbestos awareness course. This course will be taught by the Designated Person.

3. The following topics must be included and covered in the course curriculum for all the above personnel.
   a. Asbestos minerals and their various forms and their uses in the construction industry.

   b. The short term and long term health effects and the synergistic relationships, associated with exposure to asbestos fibers.

   c. The locations and danger levels associated with the known asbestos containing materials within a building.
d. The recognition of damaged, deteriorated, or delaminated asbestos containing materials.

e. The location and the time periods for, and the availability of, the O&M plan.

13 Semi-annual Periodic Surveillance

13.1 Inspection:

1. A person (trained and qualified to identify and assess ACM) must make assessments of the asbestos containing materials twice a year and document the current condition of all known asbestos containing materials.

2. The Designated Person must take any corrective action that is deemed necessary and fully document all actions by report. These reports and the visual inspection must be amended into the O&M plan.

13.2 Report

The inspection report should include at a minimum:

1. The date of the inspection.
2. The name of the person performing the inspection.
3. A list of current conditions and assessments for each of the materials listed in the original asbestos inspection. If any condition or assessment are different from the original conditions and assessments the Designated Person must write a detailed report on that area and take appropriate actions.
4. A list of all corrective response actions generated for each of the materials. If any corrective or response action was taken then the Designated Person must write a detailed report on that area.

14 Annual Operations & Maintenance Plan update

Each year the Designated Person will be responsible for the upgrading of the O&M plan to include documentation of all asbestos inspections, removal operations, fiber release episodes and periodic surveillance.

The operations and maintenance plan will be maintained at the Environmental Safety Office, Room 106, Daniel Building, Midwestern State University, 3410 Taft Boulevard, Wichita Falls, TX 76308

15 Record keeping

The following records of O&M work should be retained in permanent files:

1. Inspection, Assessment and Management Planning Reports
2. Semi-annual Visual Inspection reports
3. A copy of the O&M Program (initial program and all updated versions)
4. The Work Practices Used
5. Respiratory Protection Program
6. Fiber Release Reports
7. Asbestos Related Job Request Forms
8. Maintenance Work Authorization Forms that involved asbestos containing materials
9. Evaluations of Work Affecting ACM
10. Reinspection/Periodic Surveillance Reports


In accordance with current Federal and State regulations, the following records will be maintained for the required amount of time as specified for all employees engaged in asbestos-related work:

1. Personal Air Sampling/Exposure Monitoring Records
2. Historical Data (used to qualify for exemptions from OSHA's initial monitoring requirements)
3. Medical Records (for employees subject to a medical surveillance program)
4. Employee Training Records
5. Fit rest Records (for employees that use respirators)

This O&M guidance manual also recommends that records be maintained for:

1. Waste Tracking and Disposal
2. Air Monitoring Data
3. Qualifications and Performance Records for Outside Contractors performing O&M work

If settled dust sampling is used it is advisable to maintain these records also.

Note that state and local regulations may require that additional information be recorded and retained. The Texas Department of Health requires that each licensee must keep a detailed record of their involvement in each activity. The Designated Person will provide copies of all final documentation to a participating persons for their files.

Federal regulation §29 CFR 1910.1220, Hazard Communication Standard and Texas State regulation TAC §295.34 (b)(2), require that all employees or outside tradesmen that might be exposed to hazardous materials (asbestos containing materials) in the course of their work must be notified of the material and safety procedures.
EPA recommends that building owners make available all written elements of the O&M program to the building's O&M staff as well as to tenants and building occupants, if applicable. Building owners are also encouraged to consult with their legal counsel concerning appropriate record keeping strategies as a standard part of their O&M programs.

16 Confined Spaces

Confined spaces are often encountered in O&M work. Probably the most common areas encountered are crawl spaces, utility and pipe tunnels, manholes and chases. Special precautions are necessary for working in confined spaces. A confined space program, including an entry permit system, must be developed for use when confined spaces must be entered. The Designated Person or another staff person should be able to identify and assess hazards associated with confined spaces. Procedures should be developed to address potential confined space hazards. NIOSH publication number 87-113 (July 1987), entitled "Guide to Safety in Confined Spaces", includes a checklist for safe entry into confined spaces, as well as general information on confined space issues.

Confined space hazards include, but are not limited to:

1. Low oxygen content
2. Toxic atmospheres (gases, vapors and dusts)
3. Hazardous chemicals
4. Explosive atmospheres
5. Heat stress
6. Fire
7. Retention of dust and smoke
8. Insufficient lighting
9. Flooding
10. Electrical shock hazards
11. Noise

Program elements should include:

1. Entry and exit procedures
2. Standby/emergency rescue procedures
3. Head protection (from bumps, scrapes, cuts, abrasions)
4. Worker communication procedures
5. Entry permit system
6. Atmosphere monitoring
7. Ventilation
8. Isolation
9. Respiratory protection

Depending upon the hazards present, monitoring and special precautions might be needed during the work to maintain a safe work area. A separate Permit Required Confined Space Plan for compliance with OSHA standard (§29 CFR 1910.146) concerning work in confined spaces will be available at the Environmental Safety Office.

17 Conclusions

This O&M plan should be implemented as closely as feasible. All documentation in regards to the asbestos in the buildings should be attached to and implemented into the O&M plan.

Compiled from various sources and designed by:

L. Flint Skaggs, Environmental Safety Cord., TDH IAC # 10-5110
Appendix A

Executive Order

by the

Governor of the State of Texas
EXECUTIVE ORDER
BY THE
GOVERNOR OF THE STATE OF TEXAS

THE STATE OF TEXAS
EXECUTIVE DEPARTMENT
OFFICE OF THE GOVERNOR
AUSTIN, TEXAS

EXECUTIVE ORDER
GWB 95-8

RELATING TO WORKPLACE SAFETY AND HEALTH OF STATE EMPLOYEES,
CITIZENS SERVED, AND PRESERVATION OF STATE PROPERTY

WHEREAS, it is the policy of the State of Texas to provide a safe and
healthy workplace for all state employees, citizens served, and to preserve state
property; and

WHEREAS, workplace deaths, injuries and illnesses and destruction of
property produce human suffering, economic and social losses and impair the
operating efficiency of state government; and

WHEREAS, workplace deaths, injuries, illnesses, and loss of state
property can be reduced or eliminated by systematic planning, training, safe work
practices and the effective use of prevention and control measures; and

WHEREAS, occupational death, accident, illness, and property loss
prevention requires management and employee commitment, accountability,
cooperation, and leadership at all levels of state government; and

WHEREAS, laws, regulations and sound business practices pertaining to
safety and health in the workplace and preservation of property apply to the
operation of state government; and

WHEREAS, state government should lead by example by complying with
all applicable federal, and state laws, standards, rules, regulations and guidelines;

NOW, THEREFORE, I, GEORGE W. BUSH, Governor of the State of
Texas, by the authority vested in me by the Constitution and the laws of this state,
do hereby:

Proclaim that all state agencies, institutions and universities of higher
education must develop and implement comprehensive written risk
management/safety programs whose purpose is to attain the following objectives.

1. Minimize the risk of accidental job related deaths, occupational injuries and
   illnesses, and state property losses by the use of recognized loss prevention
   and control techniques.

2. Establish written performance/accountability standards and objectives to
   reduce deaths of both employees and citizens served, injuries and illnesses,
   and to conserve property resources of the state.

3. Provide adequate safety and health and property preservation training and
   education for managers, supervisors and employees.
4. Establish risk management/safety and health committees consisting of representatives from all levels and functional areas of the organization.

5. Promote work practices that ensure preservation of state property and safety of employees and citizens.

6. Establish a procedure for conducting periodic risk management/safety and health inspections so that potential hazards are detected and corrected or controlled in a timely manner.

7. Comply with all state and applicable federal laws, standards, rules, regulations and guidelines regarding employee and citizen safety and health and property preservation.

8. Designate an individual to serve as the organization's risk manager/safety officer to assist in directing its loss prevention program.

9. Promote effective investigation and management of workers' compensation claims and the prompt return to work of injured employees.

FURTHER, all state agencies' written risk management/safety and health programs must be reviewed and approved by the State Risk Management Division.

The State Risk Management Division will report biennially to the Legislature for agencies within their jurisdiction on progress in achieving improved workplace safety and health and property preservation in state government.

All state employees must be informed of the Executive Order, of its intent and requirements for fostering a safe and healthy workplace and preservation of state property throughout state government.

IN TESTIMONY WHEREOF, I have hereunto set my hand and caused the Great Seal of the State of Texas to be affixed. Done at the Capitol in the City of Austin this 29th day of June, 1995.

GEORGE W. BUSH
Governor of Texas

By the Governor

ANTONIO GARZA, JR.
Secretary of State

FILED IN THE OFFICE OF THE SECRETARY OF STATE
JUN 29 1995
Appendix B

OSHA Regulation §29 CFR 1910.1001 (5)(l)

Medical Examinations