

<b>Midland Engineering Co., Inc.</b> Safety Management System			Doc No:	ASBEST
			Initial Issue Date	12/04/15
<b>Chapter 05-Asbestos Awareness and Abatement</b>			Revision Date:	Initial Version
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## PURPOSE

To provide for a hazard free workplace from recognized asbestos issues and to outline work practices to ensure the safety and health of all company employees performing job tasks in which a potential asbestos exposure could occur.

Compliance with this program is mandatory and is applicable to all company employees who work in an environment where asbestos abatement is ongoing. Failure to comply will result in disciplinary action and/or is grounds for termination.

## PROCEDURE

**Scope and application.** This section regulates asbestos exposure in all work as defined in 29 CFR 1910.12(b), including but not limited to the following:

- Demolition or salvage of structures where asbestos is present;
- Removal or encapsulation of materials containing asbestos;
- Construction, alteration, repair, maintenance, or renovation of structures, substrates, or portions thereof, that contain asbestos;
- Installation of products containing asbestos;
- Asbestos spill/emergency cleanup; and
- Transportation, disposal, storage, containment of and housekeeping activities involving asbestos or products containing asbestos, on the site or location at which construction activities are performed.
- Coverage under this standard will be based on the nature of the work operation involving asbestos exposure.
- This section does not apply to asbestos-containing asphalt roof coatings, cements and mastics.

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## DEFINITIONS

**Aggressive method** means removal or disturbance of building material by sanding, abrading, grinding or other method that breaks, crumbles, or disintegrates intact ACM.

**Amended water** means water to which surfactant (wetting agent) has been added to increase the ability of the liquid to penetrate ACM.

**Asbestos** includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these minerals that has been chemically treated and/or altered. For purposes of this standard, "asbestos" includes PACM, as defined below.

**Asbestos-containing material (ACM)**, means any material containing more than one percent asbestos.

**Assistant Secretary** means the Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, or designee.

**Authorized person** means any person authorized by Midland Engineering Co., Inc. and required by work duties to be present in regulated areas.

**Building/facility owner** is the legal entity, including a lessee, which exercises control over management and record keeping functions relating to a building and/or facility in which activities covered by this standard take place.

**Certified Industrial Hygienist (CIH)** means one certified in the practice of industrial hygiene by the American Board of Industrial Hygiene.

**Class I asbestos work** means activities involving the removal of TSI and surfacing ACM and PACM.

**Class II asbestos work** means activities involving the removal of ACM which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastics.

**Class III asbestos work** means repair and maintenance operations, where "ACM", including TSI and surfacing ACM and PACM, is likely to be disturbed.

**Class IV asbestos work** means maintenance and custodial activities during which employees contact but do not disturb ACM or PACM and activities to clean up dust, waste and debris resulting from Class I, II, and III activities.

**Clean room** means an uncontaminated room having facilities for the storage of employees' street clothing and uncontaminated materials and equipment.

**Closely resemble** means that the major workplace conditions which have contributed to the levels of historic asbestos exposure, are no more protective than conditions of the current workplace.

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**Competent person** means, in addition to the definition in 29 CFR 1926.32 (f), one who is capable of identifying existing asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, who has the authority to take prompt corrective measures to eliminate them, as specified in 29 CFR 1926.32(f): in addition, for Class I and Class II work who is specially trained in a training course which meets the criteria of EPA's Model Accreditation Plan (40 CFR 763) for supervisor, or its equivalent and, for Class III and Class IV work, who is trained in a manner consistent with EPA requirements for training of local education agency maintenance and custodial staff as set forth at 40 CFR 763.92 (a)(2).

**Critical barrier** means one or more layers of plastic sealed over all openings into a work area or any other similarly placed physical barrier sufficient to prevent airborne asbestos in a work area from migrating to an adjacent area.

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

**Demolition** means the wrecking or taking out of any load-supporting structural member and any related razing, removing, or stripping of asbestos products.

**Director** means the Director, National Institute for Occupational Safety and Health, U.S. Department of Health and Human Services, or designee.

**Disturbance** means activities that disrupt the matrix of ACM or PACM, crumble or pulverize ACM or PACM, or generate visible debris from ACM or PACM. Disturbance includes cutting away small amounts of ACM and PACM, no greater than the amount which can be contained in one standard sized glove bag or waste bag in order to access a building component. In no event will the amount of ACM or PACM so disturbed exceed that which can be contained in one glove bag or waste bag which will not exceed 60 inches in length and width.

**Employee exposure** means that exposure to airborne asbestos that would occur if the employee were not using respiratory protective equipment.

**Equipment room (change room)** means a contaminated room located within the decontamination area that is supplied with impermeable bags or containers for the disposal of contaminated protective clothing and equipment.

**Fiber** means a particulate form of asbestos, 5 micrometers or longer, with a length-to-diameter ratio of at least 3 to 1.

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

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**High-efficiency particulate air (HEPA) filter** means a filter capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micrometers in diameter.

**Homogeneous area** means an area of surfacing material or thermal system insulation that is uniform in color and texture.

**Industrial hygienist** means a professional qualified by education, training, and experience to anticipate, recognize, evaluate and develop controls for occupational health hazards.

**Intact** means that the ACM has not crumbled, been pulverized, or otherwise deteriorated so that the asbestos is no longer likely to be bound with its matrix.

**Modification** for purposes of paragraph (g)(6)(ii), means a changed or altered procedure, material or component of a control system, which replaces a procedure, material or component of a required system. Omitting a procedure or component, or reducing or diminishing the stringency or strength of a material or component of the control system is not a "modification" for purposes of paragraph (g)(6) of this section.

**Negative Initial Exposure Assessment** means a demonstration by Midland Engineering Co., Inc., which complies with the criteria in paragraph (f)(2)(iii) of this section, that employee exposure during an operation is expected to be consistently below the PELs.

**PACM** means "presumed asbestos containing material".

**Presumed Asbestos Containing Material** means thermal system insulation and surfacing material found in buildings constructed no later than 1980. The designation of a material as "PACM" may be rebutted pursuant to paragraph (k)(5) of this section.

**Project Designer** means a person who has successfully completed the training requirements for an abatement project designer established by 40 U.S.C. Sec. 763.90(g).

**Regulated area** means: an area established by Midland Engineering Co., Inc. to demarcate areas where Class I, II, and III asbestos work is conducted, and any adjoining area where debris and waste from such asbestos work accumulate; and a work area within which airborne concentrations of asbestos, exceed or there is a reasonable possibility they may exceed the permissible exposure limit. Requirements for regulated areas are set out in paragraph (e) of this section.

**Removal** means all operations where ACM and/or PACM is taken out or stripped from structures or substrates, and includes demolition operations.

**Renovation** means the modifying of any existing structure, or portion thereof.

**Repair** means overhauling, rebuilding, reconstructing, or reconditioning of structures or substrates, including encapsulation or other repair of ACM or PACM attached to structures or substrates.

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**Surfacing material** means material that is sprayed, troweled-on or otherwise applied to surfaces (such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, and other purposes).

**Surfacing ACM** means surfacing material which contains more than 1% asbestos.

**Thermal system insulation (TSI)** means ACM applied to pipes, fittings, boilers, breeching, tanks, ducts or other structural components to prevent heat loss or gain.

**Thermal system insulation ACM** is thermal system insulation which contains more than 1% asbestos.

### PERMISSIBLE EXPOSURE LIMITS (PELS)

- **Time-weighted average limit (TWA).** Midland Engineering Co., Inc. will ensure that no employee is exposed to an airborne concentration of asbestos in excess of 0.1 fiber per cubic centimeter of air as an eight (8) hour time-weighted average (TWA), as determined by the method prescribed in Appendix A to this section, or by an equivalent method.
- **Excursion limit.** Midland Engineering Co., Inc. will ensure that no employee is exposed to an airborne concentration of asbestos in excess of 1.0 fiber per cubic centimeter of air (1 f/cc) as averaged over a sampling period of thirty (30) minutes, as determined by the method prescribed in Appendix A to this section, or by an equivalent method.

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## MULTI-EMPLOYER WORKSITES

On multi-employer worksites, an employer performing work requiring the establishment of a regulated area will inform other employers on the site of the nature of Midland Engineering Co., Inc.'s work with asbestos and/or PACM, of the existence of and requirements pertaining to regulated areas, and the measures taken to ensure that employees of such other employers are not exposed to asbestos.

Asbestos hazards at a multi-employer work site will be abated by the contractor who created or controls the source of asbestos contamination. For example, if there is a significant breach of an enclosure containing Class I work, Midland Engineering Co., Inc. responsible for erecting the enclosure will repair the breach immediately.

In addition, all employers of employees exposed to asbestos hazards will comply with applicable protective provisions to protect their employees. For example, if employees working immediately adjacent to a Class I asbestos job are exposed to asbestos due to the inadequate containment of such job, their employer will either remove the employees from the area until the enclosure breach is repaired; or perform an initial exposure assessment.

All employers of employees working adjacent to regulated areas established by another employer on a multi-employer work-site will take steps on a daily basis to ascertain the integrity of the enclosure and/or the effectiveness of the control method relied on by the primary asbestos contractor to assure that asbestos fibers do not migrate to such adjacent areas.

All general contractors on a construction project which includes work covered by this standard will be deemed to exercise general supervisory authority over the work covered by this standard, even though the general contractor is not qualified to serve as the asbestos "competent person". As supervisor of the entire project, the general contractor will ascertain whether the asbestos contractor is in compliance with this standard, and will require such contractor to come into compliance with this standard when necessary.

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## ASBESTOS AWARENESS

Asbestos is a commercial term given to 6 naturally occurring minerals that are incombustible and separable into filaments: chrysotile, amosite, crocidolite, anthophyllite, tremolite and actinolite. Only the first three have wide-spread commercial use. Chrysotile is a member of the serpentine group of minerals; crocidolite, amosite and the others belong to the amphibole group.

Chrysotile, or white asbestos, currently accounts for more than 98% of world asbestos consumption. Its fibers are characterized by high tensile strength, resistance to alkalis, high flexibility and good spin ability.

### Asbestos Exposure

Because asbestos fibers are naturally occurring and extremely aerodynamic, virtually everyone is exposed to asbestos. To be a significant health concern, asbestos fibers must be inhaled at high concentrations over an extended period of time. Asbestos fibers then accumulate in the lungs. As exposure increases, the risk of disease also increases. Therefore, measures to minimize exposure and consequently minimize accumulation of fibers will reduce the risk of adverse health effects.

Asbestos is only dangerous if it becomes airborne. As long as asbestos containing materials are not damaged, the asbestos fibers do not become airborne and do not pose a health threat to the building occupants. During an asbestos building survey, inspectors assess the condition of asbestos containing materials. These conditions do deteriorate over time. If Employees find that an asbestos containing item has been damaged, contact the supervisor for a hazard assessment immediately.

### COMMON MATERIALS CONTAINING ASBESTOS

Asbestos may be found in many different products and many different places. Examples of products that might contain asbestos are:

- Sprayed-on fire proofing and insulation in buildings
- Insulation for pipes and boilers
- Wall and ceiling insulation
- Ceiling tiles
- Floor tiles
- Putties, caulks, and cements (such as in chemical carrying cement pipes)
- Roofing shingles
- Siding shingles on old residential buildings
- Wall and ceiling texture in older buildings and homes
- Joint compound in older buildings and homes
- Brake linings and clutch pads

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## Asbestos Diseases

As asbestos fibers accumulate in the lungs, several types of diseases may occur.

Asbestosis is a scarring of the lung tissue. This scarring impairs the elasticity of the lung and hampers its ability to exchange gases. This leads to inadequate oxygen intake to the blood. Asbestosis restricts breathing leading to decreased lung volume and increased resistance in the airways. It is a slowly progressive disease with a latency period of 15 to 30 years.

Mesothelioma. It is a cancer of the pleural lining. It is considered to be exclusively related to asbestos exposure. By the time it is diagnosed, it is almost always fatal. Similar to other asbestos related diseases, mesothelioma has a longer latency period of 30 to 40 years.

Lung Cancer is a malignant tumor of the bronchi covering. The tumor grows through surrounding tissue, invading and often obstructing air passages. The time between exposure to asbestos and the occurrence of lung cancer is 20 to 30 years. It should be noted that there is a synergistic effect between smoking and asbestos exposure, which creates an extreme susceptibility to lung cancer.

*Airborne Fiber Concentrations*

## REGULATED AREAS

All Class I, II and III asbestos work will be conducted within regulated areas. All other operations covered by this standard will be conducted within a regulated area where airborne concentrations of asbestos exceed, or there is a reasonable possibility they may exceed a PEL. Regulated areas will comply with the requirements of this section.

- **Demarcation.** The regulated area will be demarcated in any manner that minimizes the number of persons within the area and protects persons outside the area from exposure to airborne asbestos. Where critical barriers or negative pressure enclosures are used, they may demarcate the regulated area. Signs will be provided and displayed pursuant to the requirements of paragraph (k)(7) of this section.
- **Access.** Access to regulated areas will be limited to authorized persons and to persons authorized by the Act or regulations issued pursuant thereto.
- **Respirators.** All persons entering a regulated area where employees are required pursuant to paragraph (h)(1) of this section to wear respirators will be supplied with a respirator selected in accordance with paragraph (h)(2) of this section.
- **Prohibited activities.** Midland Engineering Co., Inc. will ensure that employees do not eat, drink, smoke, chew tobacco or gum, or apply cosmetics in the regulated area.
- **Competent Persons.** Midland Engineering Co., Inc. will ensure that all asbestos work performed within regulated areas is supervised by a competent person, as defined in paragraph (b) of this section. The duties of the competent person are set out in paragraph (o) of this section.



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## EXPOSURE ASSESSMENTS AND MONITORING

### General Monitoring Criteria

Each employer who has a workplace or work operation where exposure monitoring is required under this section will perform monitoring to determine accurately the airborne concentrations of asbestos to which employees may be exposed.

Determinations of employee exposure will be made from breathing zone air samples that are representative of the 8-hour TWA and 30-minute short-term exposures of each employee.

Representative 8-hour TWA employee exposure will be determined on the basis of one or more samples representing full-shift exposure for employees in each work area. Representative 30-minute short-term employee exposures will be determined on the basis of one or more samples representing 30 minute exposures associated with operations that are most likely to produce exposures above the excursion limit for employees in each work area.

### Initial Exposure Assessment

Each employer who has a workplace or work operation covered by this standard will ensure that a "competent person" conducts an exposure assessment immediately before or at the initiation of the operation to ascertain expected exposures during that operation or workplace. The assessment must be completed in time to comply with requirements which are triggered by exposure data or the lack of a "negative exposure assessment," and to provide information necessary to assure that all control systems planned are appropriate for that operation and will work properly.

Basis of Initial Exposure Assessment: Unless a negative exposure assessment has been made, the initial exposure assessment will, if feasible, be based on monitoring conducted as outlined of this section. The assessment will take into consideration both the monitoring results and all observations, information or calculations which indicate employee exposure to asbestos, including any previous monitoring conducted in the workplace, or of the operations of Midland Engineering Co., Inc. which indicate the levels of airborne asbestos likely to be encountered on the job. For Class I asbestos work, until Midland Engineering Co., Inc. conducts exposure monitoring and documents that employees on that job will not be exposed in excess of the PELs, or otherwise makes a negative exposure assessment pursuant to this section, Midland Engineering Co., Inc. will presume that employees are exposed in excess of the TWA and excursion limit.

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Negative Exposure Assessment: For any one specific asbestos job which will be performed by employees who have been trained in compliance with the standard, Midland Engineering Co., Inc. may demonstrate that employee exposures will be below the PELs by data which conform to the following criteria;

- Objective data demonstrating that the product or material containing asbestos minerals or the activity involving such product or material cannot release airborne fibers in concentrations exceeding the TWA and excursion limit under those work conditions having the greatest potential for releasing asbestos; or
- Where Midland Engineering Co., Inc. has monitored prior asbestos jobs for the PEL and the excursion limit within 12 months of the current or projected job, the monitoring and analysis were performed in compliance with the asbestos standard in effect; and the data were obtained during work operations conducted under workplace conditions "closely resembling" the processes, type of material, control methods, work practices, and environmental conditions used and prevailing in Midland Engineering Co., Inc.'s current operations, the operations were conducted by employees whose training and experience are no more extensive than that of employees performing the current job, and these data show that under the conditions prevailing and which will prevail in the current workplace there is a high degree of certainty that employee exposures will not exceed the TWA and excursion limit; or
- The results of initial exposure monitoring of the current job made from breathing zone air samples that are representative of the 8-hour TWA and 30-minute short-term exposures of each employee covering operations which are most likely during the performance of the entire asbestos job to result in exposures over the PELs.

#### Periodic Monitoring

**Class I and II operations.** Midland Engineering Co., Inc. will conduct daily monitoring that is representative of the exposure of each employee who is assigned to work within a regulated area who is performing Class I or II work, unless Midland Engineering Co., Inc. has made a negative exposure assessment for the entire operation.

**All operations under the standard other than Class I and II operations.** Midland Engineering Co., Inc. will conduct periodic monitoring of all work where exposures are expected to exceed a PEL, at intervals sufficient to document the validity of the exposure prediction.

**Exception:** When all employees required to be monitored daily are equipped with supplied-air respirators operated in the pressure demand mode, or other positive pressure mode respirator, Midland Engineering Co., Inc. may dispense with the daily monitoring required by this paragraph. However, employees performing Class I work using a control method which is not listed in this section or using a modification of a listed control method, will continue to be monitored daily even if they are equipped with supplied-air respirators.

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### Termination of Monitoring

If the periodic monitoring required reveals that employee exposures, as indicated by statistically reliable measurements, are below the permissible exposure limit and excursion limit Midland Engineering Co., Inc. may discontinue monitoring for those employees whose exposures are represented by such monitoring.

### Additional Monitoring

Midland Engineering Co., Inc. will institute the exposure monitoring required whenever there has been a change in process, control equipment, personnel or work practices that may result in new or additional exposures above the permissible exposure limit and/or excursion limit or when Midland Engineering Co., Inc. has any reason to suspect that a change may result in new or additional exposures above the permissible exposure limit and/or excursion limit. Such additional monitoring is required regardless of whether a "negative exposure assessment" was previously produced for a specific job.

### Employee Notification of Monitoring Results

Midland Engineering Co., Inc. must, as soon as possible but no later than 5 working days after the receipt of the results of any monitoring performed under this section, notify each affected employee of these results either individually in writing or by posting the results in an appropriate location that is accessible to employees.

Midland Engineering Co., Inc. will notify affected employees of the monitoring results that represent that employee's exposure as soon as possible following receipt of monitoring results.

Midland Engineering Co., Inc. will notify affected employees of the results of monitoring representing the employee's exposure in writing either individually or by posting at a centrally located place that is accessible to affected employees.

### Observation of Monitoring

Midland Engineering Co., Inc. will provide affected employees and their designated representatives an opportunity to observe any monitoring of employee exposure to asbestos conducted in accordance with this program.

When observation of the monitoring of employee exposure to asbestos requires entry into an area where the use of protective clothing or equipment is required, the observer will be provided with and be required to use such clothing and equipment and will comply with all other applicable safety and health procedures.

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## METHODS OF COMPLIANCE

Company will use the following engineering controls and work practices in all operations covered by this section, regardless of the levels of exposure:

- Vacuum cleaners equipped with HEPA filters to collect all debris and dust containing ACM and PACM, except in the case of roofing material.
- Wet methods, or wetting agents, to control employee exposures during asbestos handling, mixing, removal, cutting, application, and cleanup, except where employers demonstrate that the use of wet methods is infeasible due to for example, the creation of electrical hazards, equipment malfunction, and, in the case of roofing material.
- Prompt clean-up and disposal of wastes and debris contaminated with asbestos in leak-tight containers except in roofing operations, where applicable.

In addition, Midland Engineering Co., Inc. will use the following control methods to achieve compliance with the TWA permissible exposure limit;

- Local exhaust ventilation equipped with HEPA filter dust collection systems;
- Enclosure or isolation of processes producing asbestos dust;
- Ventilation of the regulated area to move contaminated air away from the breathing zone of employees and toward a filtration or collection device equipped with a HEPA filter;
- Use of other work practices and engineering controls that the Assistant Secretary can show to be feasible.

Wherever the feasible engineering and work practice controls described above are not sufficient to reduce employee exposure to or below the permissible exposure limit and/or excursion limit, Midland Engineering Co., Inc. will use them to reduce employee exposure to the lowest levels attainable by these controls and will supplement them by the use of respiratory protection that complies with the requirements of program.

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### Prohibitions

The following work practices and engineering controls will not be used for work related to asbestos or for work which disturbs ACM or PACM, regardless of measured levels of asbestos exposure or the results of initial exposure assessments:

- High-speed abrasive disc saws that are not equipped with point of cut ventilator or enclosures with HEPA filtered exhaust air.
- Compressed air used to remove asbestos, or materials containing asbestos, unless the compressed air is used in conjunction with an enclosed ventilation system designed to capture the dust cloud created by the compressed air.
- Dry sweeping, shoveling or other dry clean-up of dust and debris containing ACM and PACM.
- Employee rotation as a means of reducing employee exposure to asbestos.

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### Class I Requirements

In addition to the requirements of this program, the following engineering controls and work practices and procedures will be used.

All Class I work, including the installation and operation of the control system will be supervised by a competent person

For all Class I jobs involving the removal of more than 25 linear or 10 square feet of thermal system insulation or surfacing material; for all other Class I jobs, where Midland Engineering Co., Inc. cannot produce a negative exposure assessment, or where employees are working in areas adjacent to the regulated area, while the Class I work is being performed, Midland Engineering Co., Inc. will use one of the following methods to ensure that airborne asbestos does not migrate from the regulated area:

- Critical barriers will be placed over all the openings to the regulated area, except where activities are performed outdoors; or
- Midland Engineering Co., Inc. will use another barrier or isolation method which prevents the migration of airborne asbestos from the regulated area, as verified by perimeter area surveillance during each work shift at each boundary of the regulated area, showing no visible asbestos dust; and perimeter area monitoring showing that clearance levels contained and that the EPA Asbestos in Schools Rule are met, or that perimeter area levels, measured by Phase Contrast Microscopy (PCM) are no more than background levels representing the same area before the asbestos work began. The results of such monitoring will be made known to Midland Engineering Co., Inc. no later than 24 hours from the end of the work shift represented by such monitoring. Exception: For work completed outdoors where employees are not working in areas adjacent to the regulated areas, this is satisfied when the specific control methods this section are used.
- For all Class I jobs, HVAC systems will be isolated in the regulated area by sealing with a double layer of 6 mil plastic or the equivalent;
- For all Class I jobs, impermeable drop cloths will be placed on surfaces beneath all removal activity;
- For all Class I jobs, all objects within the regulated area will be covered with impermeable drop cloths or plastic sheeting which is secured by duct tape or an equivalent.
- For all Class I jobs where Midland Engineering Co., Inc. cannot produce a negative exposure assessment, or where exposure monitoring shows that a PEL is exceeded, Midland Engineering Co., Inc. will ventilate the regulated area to move contaminated air away from the breathing zone of employees toward a HEPA filtration or collection device.

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### Specific control methods for Class I work

In addition, Class I asbestos work will be performed using one or more of the following control methods pursuant to the limitations stated below:

- Negative Pressure Enclosure (NPE) systems: NPE systems may be used where the configuration of the work area does not make the erection of the enclosure infeasible, with the following specifications and work practices.
  - **Specifications:**
    - The negative pressure enclosure (NPE) may be of any configuration,
    - At least 4 air changes per hour will be maintained in the NPE,
    - A minimum of -0.02 column inches of water pressure differential, relative to outside pressure, will be maintained within the NPE as evidenced by manometric measurements,
    - The NPE will be kept under negative pressure throughout the period of its use, and
    - Air movement will be directed away from employees performing asbestos work within the enclosure, and toward a HEPA filtration or a collection device.
  - **Work Practices:**
    - Before beginning work within the enclosure and at the beginning of each shift, the NPE will be inspected for breaches and smoke-tested for leaks, and any leaks sealed.
    - Electrical circuits in the enclosure will be deactivated, unless equipped with ground-fault circuit interrupters.
  
- Glovebag systems may be used to remove PACM and/or ACM from straight runs of piping and elbows and other connections with the following specifications and work practices:
  - **Specifications:**
    - Glovebags will be made of 6 mil thick plastic and will be seamless at the bottom.
    - Glovebags used on elbows and other connections must be designed for that purpose and used without modifications.
  - **Work Practices:**
    - Each glovebag will be installed so that it completely covers the circumference of pipe or other structure where the work is to be done.
    - Glovebags will be smoke-tested for leaks and any leaks sealed prior to use.
    - Glovebags may be used only once and may not be moved.
    - Glovebags will not be used on surfaces whose temperature exceeds 150 deg. F.
    - Prior to disposal, glove bags will be collapsed by removing air within them using a HEPA vacuum.
    - Before beginning the operation, loose and friable material adjacent to the glovebag/box operation will be wrapped and sealed in two layers of six mil plastic or otherwise rendered intact,
    - Where system uses attached waste bag, such bag will be connected to collection bag using hose or other material which will withstand pressure of ACM waste and water without losing its integrity:
    - Sliding valve or other device will separate waste bag from hose to ensure no exposure when waste bag is disconnected:

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- At least two persons will perform Class I glove bag removal operations.
- Negative pressure glove bag systems may be used to remove ACM or PACM from piping.
  - **Specifications:**
    - In addition to specifications for glove bag systems above, negative pressure glove bag systems will attach HEPA vacuum systems or other devices to bag to prevent collapse during removal.
  - **Work Practices:**
    - Midland Engineering Co., Inc. will comply with the work practices for glove bag systems.
    - The HEPA vacuum cleaner or other device used to prevent collapse of bag during removal will run continually during the operation until it is completed at which time the bag will be collapsed prior to removal of the bag from the pipe.
    - Where a separate waste bag is used along with a collection bag and discarded after one use, the collection bag may be reused if rinsed clean with amended water before reuse.
- Negative Pressure Glove Box Systems: Negative pressure glove boxes may be used to remove ACM or PACM from pipe runs with the following specifications and work practices.
  - **Specifications:**
    - Gloveboxes will be constructed with rigid sides and made from metal or other material which can withstand the weight of the ACM and PACM and water used during removal:
    - A negative pressure generator will be used to create negative pressure in the system:
    - An air filtration unit will be attached to the box:
    - The box will be fitted with gloved apertures:
    - An aperture at the base of the box will serve as a bagging outlet for waste ACM and water:
    - A back-up generator will be present on site:
    - Waste bags will consist of 6 mil thick plastic double-bagged before they are filled or plastic thicker than 6 mil.
  - **Work practices:**
    - At least two persons will perform the removal:
    - The box will be smoke-tested for leaks and any leaks sealed prior to each use:
    - Loose or damaged ACM adjacent to the box will be wrapped and sealed in two layers of 6 mil plastic prior to the job, or otherwise made intact prior to the job.
    - A HEPA filtration system will be used to maintain pressure barrier in box.



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- A water spray process system may be used for removal of ACM and PACM from cold line piping if, employees carrying out such process have completed a 40-hour separate training course in its use, in addition to training required for employees performing Class I work. The system will meet the following specifications and will be performed by employees using the following work practices.
  - **Specifications:**
    - Piping will be surrounded on 3 sides by rigid framing,
    - A 360 degree water spray, delivered through nozzles supplied by a high pressure separate water line, will be formed around the piping.
    - The spray will collide to form a fine aerosol which provides a liquid barrier between workers and the ACM and PACM.
  - **Work Practices:**
    - The system will be run for at least 10 minutes before removal begins.
    - All removal will take place within the water barrier.
    - The system will be operated by at least three persons, one of whom will not perform removal, but will check equipment, and ensure proper operation of the system.
    - After removal, the ACM and PACM will be bagged while still inside the water barrier.
  
- A small walk-in enclosure which accommodates no more than two persons (mini-enclosure) may be used if the disturbance or removal can be completely contained by the enclosure with the following specifications and work practices.
  - **Specifications:**
    - The fabricated or job-made enclosure will be constructed of 6 mil plastic or equivalent:
    - The enclosure will be placed under negative pressure by means of a HEPA filtered vacuum or similar ventilation unit:
  - **Work practices:**
    - Before use, the mini-enclosure will be inspected for leaks and smoke-tested to detect breaches, and breaches sealed.
    - Before reuse, the interior will be completely washed with amended water and HEPA-vacuumed.
    - During use, air movement will be directed away from the employee's breathing zone within the mini-enclosure.

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#### Alternative control methods for Class I work

Class I work may be performed using a control method which is not referenced in this section, or which modifies a control method referenced in this section, if the following provisions are complied with:

- The control method will enclose, contain or isolate the processes or source of airborne asbestos dust, or otherwise capture or redirect such dust before it enters the breathing zone of employees.
- A certified industrial hygienist or licensed professional engineer who is also qualified as a project designer, will evaluate the work area, the projected work practices and the engineering controls and will certify in writing that the planned control method is adequate to reduce direct and indirect employee exposure to below the PELs under worst-case conditions of use, and that the planned control method will prevent asbestos contamination outside the regulated area, as measured by clearance sampling which meets the requirements of EPA's Asbestos in Schools rule, or perimeter monitoring.
- Where the TSI or surfacing material to be removed is 25 linear or 10 square feet or less , the evaluation may be performed by a "competent person", and may omit consideration of perimeter or clearance monitoring otherwise required.

The evaluation of employee exposure required in this section, will include and be based on sampling and analytical data representing employee exposure during the use of such method under worst-case conditions and by employees whose training and experience are equivalent to employees who are to perform the current job.

#### Work Practices and Engineering Controls for Class II work

All Class II work will be supervised by a competent person. For all indoor Class II jobs, where Midland Engineering Co., Inc. has not produced a negative exposure assessment or where during the job, changed conditions indicate there may be exposure above the PEL or where Midland Engineering Co., Inc. does not remove the ACM in a substantially intact state, Midland Engineering Co., Inc. will use one of the following methods to ensure that airborne asbestos does not migrate from the regulated area;

- Critical barriers will be placed over all openings to the regulated area; or,
- Midland Engineering Co., Inc. will use another barrier or isolation method which prevents the migration of airborne asbestos from the regulated area, as verified by perimeter area monitoring or clearance monitoring.
- Impermeable drop cloths will be placed on surfaces beneath all removal activity;

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All Class II asbestos work will be performed using the work practices and requirements set out above in this section.

Additional Controls for Class II work

Class II asbestos work will also be performed by complying with the work practices and controls designated for each type of asbestos work to be performed set out in this paragraph. Where more than one control method may be used for a type of asbestos work, Midland Engineering Co., Inc. may choose one or a combination of designated control methods. Class II work also may be performed using a method allowed for Class I work, except that glove bags and glove boxes are allowed if they fully enclose the Class II material to be removed.

For removing vinyl and asphalt flooring materials which contain ACM or for which in buildings constructed no later than 1980 and Midland Engineering Co., Inc. has not verified the absence of ACM. Midland Engineering Co., Inc. will ensure that employees comply with the following work practices and that employees are trained in these practices:

- Flooring or its backing will not be sanded.
- Vacuums equipped with HEPA filter, disposable dust bag, and metal floor tool (no brush) will be used to clean floors.
- Resilient sheeting will be removed by cutting with wetting of the snip point and wetting during delaminating. Rip-up of resilient sheet floor material is prohibited.
- All scraping of residual adhesive and/or backing will be performed using wet methods.
- Dry sweeping is prohibited.
- Mechanical chipping is prohibited unless performed in a negative pressure enclosure which meets the requirements of paragraph (g)(5)(i) of this section.
- Tiles will be removed intact, unless Midland Engineering Co., Inc. demonstrates that intact removal is not possible.
- When tiles are heated and can be removed intact, wetting may be omitted.
- Resilient flooring material including associated mastic and backing will be assumed to be asbestos-containing unless an industrial hygienist determines that it is asbestos-free using recognized analytical techniques.

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For removing roofing material which contains ACM, Midland Engineering Co., Inc. will ensure that the following work practices are followed:

- Roofing material will be removed in an intact state to the extent feasible.
- Wet methods will be used to remove roofing materials that are not intact, or that will be rendered not intact during removal, unless such wet methods are not feasible or will create safety hazards.
- Cutting machines will be continuously misted during use, unless a competent person determines that misting substantially decreases worker safety.
- When removing built-up roofs with asbestos-containing roofing felts and an aggregate surface using a power roof cutter, all dust resulting from the cutting operation will be collected by a HEPA dust collector, or will be HEPA vacuumed by vacuuming along the cut line. When removing built-up roofs with asbestos-containing roofing felts and a smooth surface using a power roof cutter, the dust resulting from the cutting operation will be collected either by a HEPA dust collector or HEPA vacuuming along the cut line, or by gently sweeping and then carefully and completely wiping up the still-wet dust and debris left along the cut line.
- Asbestos-containing material that has been removed from a roof will not be dropped or thrown to the ground. Unless the material is carried or passed to the ground by hand, it will be lowered to the ground via covered, dust-tight chute, crane or hoist:
- Any ACM that is not intact will be lowered to the ground as soon as is practicable, but in any event no later than the end of the work shift. While the material remains on the roof it will either be kept wet, placed in an impermeable waste bag, or wrapped in plastic sheeting.
- Intact ACM will be lowered to the ground as soon as is practicable, but in any event no later than the end of the work shift.
- Upon being lowered, unwrapped material will be transferred to a closed receptacle in such manner so as to preclude the dispersion of dust.
- Roof level heating and ventilation air intake sources will be isolated or the ventilation system will be shut down.

Notwithstanding any other provision of this section, removal or repair of sections of intact roofing less than 25 square feet in area does not require use of wet methods or HEPA vacuuming as long as manual methods which do not render the material non-intact are used to remove the material and no visible dust is created by the removal method used. In determining whether a job involves less than 25 square feet, Midland Engineering Co., Inc. will include all removal and repair work performed on the same roof on the same day.

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When removing cementations asbestos-containing siding and shingles or transite panels containing ACM on building exteriors (other than roofs) Midland Engineering Co., Inc. will ensure that the following work practices are followed:

- Cutting, abrading or breaking siding, shingles, or transite panels, will be prohibited unless Midland Engineering Co., Inc. can demonstrate that methods less likely to result in asbestos fiber release cannot be used.
- Each panel or shingle will be sprayed with amended water prior to removal.
- Unwrapped or unbagged panels or shingles will be immediately lowered to the ground via covered dust-tight chute, crane or hoist, or placed in an impervious waste bag or wrapped in plastic sheeting and lowered to the ground no later than the end of the work shift.
- Nails will be cut with flat, sharp instruments.

When removing gaskets containing ACM, Midland Engineering Co., Inc. will ensure that the following work practices are followed:

- If a gasket is visibly deteriorated and unlikely to be removed intact, removal will be undertaken within a glove bag.
- The gasket will be immediately placed in a disposal container.
- Any scraping to remove residue must be performed wet.

When performing any other Class II removal of asbestos containing material for which specific controls have not been listed, Midland Engineering Co., Inc. will ensure that the following work practices are complied with.

- The material will be thoroughly wetted with amended water prior to and during its removal.
- The material will be removed in an intact state unless Midland Engineering Co., Inc. demonstrates that intact removal is not possible.
- Cutting, abrading or breaking the material will be prohibited unless Midland Engineering Co., Inc. can demonstrate that methods less likely to result in asbestos fiber release are not feasible.
- Asbestos-containing material removed, will be immediately bagged or wrapped, or kept wetted until transferred to a closed receptacle, no later than the end of the work shift.

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### Alternative Work Practices and Controls

Instead of the work practices and controls listed, Midland Engineering Co., Inc. may use different or modified engineering and work practice controls if the following provisions are complied with.

- Midland Engineering Co., Inc. will demonstrate by data representing employee exposure during the use of such method under conditions which closely resemble the conditions under which the method is to be used, that employee exposure will not exceed the PELs under any anticipated circumstances.
- A competent person will evaluate the work area, the projected work practices and the engineering controls, and will certify in writing, that the different or modified controls are adequate to reduce direct and indirect employee exposure to below the PELs under all expected conditions of use and that the method meets the requirements of this standard. The evaluation will include and be based on data representing employee exposure during the use of such method under conditions which closely resemble the conditions under which the method is to be used for the current job, and by employees whose training and experience are equivalent to employees who are to perform the current job.

### Work Practices and Engineering Controls for Class III asbestos work

Class III asbestos work will be conducted using engineering and work practice controls which minimize the exposure to employees performing the asbestos work and to bystander employees.

- The work will be performed using wet methods.
- To the extent feasible, the work will be performed using local exhaust ventilation.
- Where the disturbance involves drilling, cutting, abrading, sanding, chipping, breaking, or sawing of thermal system insulation or surfacing material, Midland Engineering Co., Inc. will use impermeable dropcloths, and will isolate the operation using mini-enclosures or glove bag systems pursuant or another isolation method.
- Where Midland Engineering Co., Inc. does not produce a "negative exposure assessment" for a job, or where monitoring results show the PEL has been exceeded, Midland Engineering Co., Inc. will contain the area using impermeable dropcloths and plastic barriers or their equivalent, or will isolate the operation using a control system
- Employees performing Class III jobs, which involve the disturbance of thermal system insulation or surfacing material, or where Midland Engineering Co., Inc. does not produce a "negative exposure assessment" or where monitoring results show a PEL has been exceeded, will wear respirators which are selected, used and fitted as outlined in this program.

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#### Class IV asbestos Work

Class IV asbestos jobs will be conducted by employees trained in asbestos awareness as stated in this program. In addition, all Class IV jobs will be conducted in conformity with the requirements in this program, mandating wet methods, HEPA vacuums, and prompt clean up of debris containing ACM or PACM.

Employees cleaning up debris and waste in a regulated area where respirators are required will wear respirators which are selected, used and fitted as outlined in this program.

Employers of employees who clean up waste and debris in, and employers in control of, areas where friable thermal system insulation or surfacing material is accessible, will assume that such waste and debris contain asbestos.

#### Alternative methods of compliance for installation, removal, repair, and maintenance of certain roofing and pipeline coating materials

Notwithstanding any other provision of this section, an employer who complies with all provisions of Class IV Work when installing, removing, repairing, or maintaining intact pipeline asphaltic wrap, or roof flashings which contain asbestos fibers encapsulated or coated by bituminous or resinous compounds will be deemed to be in compliance with this section. If an employer does not comply with all provisions of this program or if during the course of the job the material does not remain intact, the provisions of Class II work apply instead.

- Before work begins and as needed during the job, a competent person who is capable of identifying asbestos hazards in the workplace and selecting the appropriate control strategy for asbestos exposure, and who has the authority to take prompt corrective measures to eliminate such hazards, will conduct an inspection of the worksite and determine that the roofing material is intact and will likely remain intact.
- All employees performing work covered by this section will be trained in a training program that meets the requirements of Employee Information and Training of this program.
- The material will not be sanded, abraded, or ground. Manual methods which do not render the material non-intact will be used.
- Material that has been removed from a roof will not be dropped or thrown to the ground. Unless the material is carried or passed to the ground by hand, it will be lowered to the ground via covered, dust-tight chute, crane or hoist. All such material will be removed from the roof as soon as is practicable, but in any event no later than the end of the work shift.
- Where roofing products which have been labeled as containing asbestos are installed on non-residential roofs during operations covered by this paragraph, Midland Engineering Co., Inc. will notify the building owner of the presence and location of such materials no later than the end of the job.
- All removal or disturbance of pipeline asphaltic wrap will be performed using wet methods.

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## RESPIRATORY PROTECTION

### General

For employees who use respirators required by this section, Midland Engineering Co., Inc. will provide each employee an appropriate respirator that complies with the requirements of this paragraph.

Respirators must be used during:

- Class I asbestos work.
- Class II asbestos work when ACM is not removed in a substantially intact state.
- Class II and III asbestos work that is not performed using wet methods, except for removal of ACM from sloped roofs when a negative-exposure assessment has been conducted and ACM is removed in an intact state.
- Class II and III asbestos work for which a negative-exposure assessment has not been conducted.
- Class III asbestos work when TSI or surfacing ACM or PACM is being disturbed.
- Class IV asbestos work performed within regulated areas where employees who are performing other work are required to use respirators.
- Work operations covered by this section for which employees are exposed above the TWA or excursion limit.
- Emergencies.

### Respirator Program

Midland Engineering Co., Inc. will implement a respiratory protection program which covers each employee required by this section to use a respirator.

No employee will be assigned to asbestos work that requires respirator use if, based on their most recent medical examination, the examining physician determines that the employee will be unable to function normally while using a respirator, or that the safety or health of the employee or other employees will be impaired by the employee's respirator use. Such employees must be assigned to another job or given the opportunity to transfer to a different position that they can perform. If such a transfer position is available, it must be with the same employer, in the same geographical area, and with the same seniority, status, rate of pay, and other job benefits the employee had just prior to such transfer.



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## Respirator Selection

Employers must:

- Select, and provide to employees, the appropriate respirators specified in paragraph the respiratory protection program; however, employers must not select or use filtering facepiece respirators for use against asbestos fibers.
- Provide HEPA filters for powered and non-powered air-purifying respirators.
- Employers must provide an employee with tight-fitting, powered air-purifying respirator (PAPR) instead of a negative pressure respirator selected according to respiratory protection section of this program when the employee chooses to use a PAPR and it provides adequate protection to the employee.

Employers must provide employees with an air-purifying half mask respirator, other than a filtering facepiece respirator, whenever the employees perform:

- Class II or Class III asbestos work for which no negative exposure assessment is available.
- Class III asbestos work involving disturbance of TSI or surfacing ACM or PACM.

Employers must provide employees with:

- A tight-fitting powered air-purifying respirator or a full facepiece, supplied-air respirator operated in the pressure-demand mode and equipped with either HEPA egress cartridges or an auxiliary positive-pressure, self-contained breathing apparatus (SCBA) whenever the employees are in a regulated area performing Class I asbestos work for which a negative exposure assessment is not available and the exposure assessment indicates that the exposure level will be at or below 1 f/cc as an 8-hour time-weighted average (TWA).
- A full facepiece supplied-air respirator operated in the pressure-demand mode and equipped with an auxiliary positive-pressure SCBA whenever the employees are in a regulated area performing Class I asbestos work for which a negative exposure assessment is not available and the exposure assessment indicates that the exposure level will be above 1 f/cc as an 8-hour TWA.

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## PROTECTIVE CLOTHING

### General

Midland Engineering Co., Inc. will provide and require the use of protective clothing, such as coveralls or similar whole-body clothing, head coverings, gloves, and foot coverings for any employee exposed to airborne concentrations of asbestos that exceed the TWA and/or excursion limit, or for which a required negative exposure assessment is not produced, or for any employee performing Class I operations which involve the removal of over 25 linear or 10 square feet of TSI or surfacing ACM and PACM.

## LAUNDERING

Midland Engineering Co., Inc. will ensure that laundering of contaminated clothing is done so as to prevent the release of airborne asbestos in excess of the TWA or excursion limit as stated in the Permissible Exposure Limits section of this program.

Any employer who gives contaminated clothing to another person for laundering will inform such person of the above stated requirement to effectively prevent the release of airborne asbestos in excess of the TWA and excursion limit as stated in the Permissible Exposure Limits section of this program

### Contaminated Clothing

Contaminated clothing will be transported in sealed impermeable bags, or other closed, impermeable containers, and be labeled in accordance with this program.

### Inspection of Protective Clothing

The competent person will examine worksuits worn by employees at least once per workshift for rips or tears that may occur during performance of work.

When rips or tears are detected while an employee is working, rips and tears will be immediately mended, or the worksuit will be immediately replaced.

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## HYGIENE FACILITIES AND PRACTICES FOR EMPLOYEES

Requirements for employees performing Class I asbestos jobs involving over 25 linear or 10 square feet of TSI or surfacing ACM and PACM.

### Decontamination Areas

Midland Engineering Co., Inc. will establish a decontamination area that is adjacent and connected to the regulated area for the decontamination of such employees. The decontamination area will consist of an equipment room, shower area, and clean room in series. Midland Engineering Co., Inc. will ensure that employees enter and exit the regulated area through the decontamination area.

### Equipment Room

The equipment room will be supplied with impermeable, labeled bags and containers for the containment and disposal of contaminated protective equipment.

### Shower Area

Shower facilities will be provided which comply with 29 CFR 1910.141(d)(3), unless Midland Engineering Co., Inc. can demonstrate that they are not feasible. The showers will be adjacent both to the equipment room and the clean room, unless Midland Engineering Co., Inc. can demonstrate that this location is not feasible. Where Midland Engineering Co., Inc. can demonstrate that it is not feasible to locate the shower between the equipment room and the clean room, or where the work is performed outdoors, Midland Engineering Co., Inc. will ensure that employees:

- Remove asbestos contamination from their worksuits in the equipment room using a HEPA vacuum before proceeding to a shower that is not adjacent to the work area; or
- Remove their contaminated worksuits in the equipment room, then don clean worksuits, and proceed to a shower that is not adjacent to the work area.

### Clean Change Room

The clean room will be equipped with a locker or appropriate storage container for each employee's use. When Midland Engineering Co., Inc. can demonstrate that it is not feasible to provide a clean change area adjacent to the work area or where the work is performed outdoors, Midland Engineering Co., Inc. may permit employees engaged in Class I asbestos jobs to clean their protective clothing with a portable HEPA-equipped vacuum before such employees leave the regulated area. Following showering, such employees however must then change into street clothing in clean change areas provided by Midland Engineering Co., Inc. which otherwise meet the requirements of this section.

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### Decontamination Area Entry Procedures

Midland Engineering Co., Inc. will ensure that employees:

- Enter the decontamination area through the clean room;
- Remove and deposit street clothing within a locker provided for their use; and
- Put on protective clothing and respiratory protection before leaving the clean room.
- Before entering the regulated area, Midland Engineering Co., Inc. will ensure that employees pass through the equipment room.

### Decontamination Area Exit Procedures

Midland Engineering Co., Inc. will ensure that:

- Before leaving the regulated area, employees will remove all gross contamination and debris from their protective clothing.
- Employees will remove their protective clothing in the equipment room and deposit the clothing in labeled impermeable bags or containers.
- Employees will not remove their respirators in the equipment room.
- Employees will shower prior to entering the clean room.
- After showering, employees will enter the clean room before changing into street clothes.

### Lunch Areas

Whenever food or beverages are consumed at the worksite where employees are performing Class I asbestos work, Midland Engineering Co., Inc. will provide lunch areas in which the airborne concentrations of asbestos are below the permissible exposure limit and/or excursion limit.

Requirements for Class I work involving less than 25 linear or 10 square feet of TSI or surfacing ACM and PACM, and for Class II and Class III asbestos work operations where exposures exceed a PEL or where there is no negative exposure assessment produced before the operation.

Midland Engineering Co., Inc. will establish an equipment room or area that is adjacent to the regulated area for the decontamination of employees and their equipment which is contaminated with asbestos which will consist of an area covered by a impermeable drop cloth on the floor or horizontal working surface.

The area must be of sufficient size as to accommodate cleaning of equipment and removing personal protective equipment without spreading contamination beyond the area (as determined by visible accumulations).

Work clothing must be cleaned with a HEPA vacuum before it is removed.

All equipment and surfaces of containers filled with ACM must be cleaned prior to removing them from the equipment room or area.

Midland Engineering Co., Inc. will ensure that employees enter and exit the regulated area through the equipment room or area.

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### Requirements for Class IV Work

Employers will ensure that employees performing Class IV work within a regulated area comply with the hygiene practice required of employees performing work which has a higher classification within that regulated area. Otherwise employers of employees cleaning up debris and material which is TSI or surfacing ACM or identified as PACM will provide decontamination facilities for such employees which are required by this section.

### Smoking in Work Areas

Midland Engineering Co., Inc. will ensure that employees do not smoke in work areas where they are occupationally exposed to asbestos because of activities in that work area.

## **COMMUNICATION OF HAZARDS**

This section applies to the communication of information concerning asbestos hazards in construction activities to facilitate compliance with this standard. Most asbestos-related construction activities involve previously installed building materials. Building owners often are the only and/or best sources of information concerning them. Therefore, they, along with employers of potentially exposed employees, are assigned specific information conveying and retention duties under this section.

Installed Asbestos Containing Building Material. Midland Engineering Co., Inc. and building owners will identify TSI and sprayed or troweled on surfacing materials in buildings as asbestos-containing, unless they determine in that the material is not asbestos-containing. Asphalt and vinyl flooring material installed no later than 1980 must also be considered as asbestos containing unless Midland Engineering Co., Inc., determines that it is not asbestos-containing. If Midland Engineering Co., Inc./building owner has actual knowledge, or should have known through the exercise of due diligence, that other materials are asbestos-containing, they too must be treated as such. When communicating information to employees, owners and Midland Engineering Co., Inc. will identify "PACM" as ACM. Additional requirements relating to communication of asbestos work on multi-employer worksites are set out in the Multi-Employer Worksites of this program.

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### Duties of Building and Facility Owners

Before work subject to this standard is begun, building and facility owners will determine the presence, location, and quantity of ACM and/or PACM at the work site pursuant to this section.

Building and/or facility owners will notify the following persons of the presence, location and quantity of ACM or PACM, at the work sites in their buildings and facilities. Notification either will be in writing, or will consist of a personal communication between the owner and the person to whom notification must be given or their authorized representatives:

- Prospective employers applying or bidding for work whose employees reasonably can be expected to work in or adjacent to areas containing such material;
- Employees of the owner who will work in or adjacent to areas containing such material;
- On multi-employer worksites, all employers of employees who will be performing work within or adjacent to areas containing such materials;
- Tenants who will occupy areas containing such material.

Duties of employers whose employees perform work subject to this standard in or adjacent to areas containing ACM and PACM. Building/facility owners whose employees perform such work will comply with these provisions to the extent applicable.

- Before work in areas containing ACM and PACM is begun; employers will identify the presence, location, and quantity of ACM, and/or PACM therein pursuant to regulations of this section.

Before work under this standard is performed employers of employees who will perform such work will inform the following persons of the location and quantity of ACM and/or PACM present in the area and the precautions to be taken to insure that airborne asbestos is confined to the area.

- Owners of the building/facility;
- Employees who will perform such work and employers of employees who work and/or will be working in adjacent areas.

Within 10 days of the completion of such work, Midland Engineering Co., Inc. whose employees have performed work subject to this standard, will inform the building/facility owner and employers of employees who will be working in the area of the current location and quantity of PACM and/or ACM remaining in the area and final monitoring results, if any.

In addition to the above requirements, all employers who discover ACM and/or PACM on a worksite will convey information concerning the presence, location and quantity of such newly discovered ACM and/or PACM to the owner and to other employers of employees working at the work site, within 24 hours of the discovery.

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Criteria to rebut the designation of installed material as PACM

At any time, an employer and/or building owner may demonstrate, for purposes of this standard, that PACM does not contain asbestos. Building owners and/or employers are not required to communicate information about the presence of building material for which such a demonstration of this section has been made. However, in all such cases, the information, data and analysis supporting the determination that PACM does not contain asbestos, will be retained.

An employer or owner may demonstrate that PACM does not contain more than 1 percent asbestos by the following:

Having a completed inspection conducted pursuant to the requirements of AHERA (40 CFR Part 763, Subpart E) which demonstrates that the material is not ACM; or  
 Performing tests of the material containing PACM which demonstrate that no ACM is present in the material. Such tests will include analysis of bulk samples collected in the manner described in 40 CFR 763.86. The tests, evaluation and sample collection will be conducted by an accredited inspector or by a CIH. Analysis of samples will be performed by persons or laboratories with proficiency demonstrated by current successful participation in a nationally recognized testing program such as the National Voluntary Laboratory Accreditation Program (NVLAP) or the National Institute for Standards and Technology (NIST) or the Round Robin for bulk samples administered by the American Industrial Hygiene Association (AIHA) or an equivalent nationally-recognized round robin testing program.

Midland Engineering Co., Inc. and/or building owner may demonstrate that flooring material including associated mastic and backing does not contain asbestos, by a determination of an industrial hygienist based upon recognized analytical techniques showing that the material is not ACM.

At the entrance to mechanical rooms/areas in which employees reasonably can be expected to enter and which contain ACM and/or PACM, the building owner will post signs which identify the material which is present, its location, and appropriate work practices which, if followed, will ensure that ACM and/or PACM will not be disturbed. Midland Engineering Co., Inc. will ensure, to the extent feasible, that employees who come in contact with these signs can comprehend them. Means to ensure employee comprehension may include the use of foreign languages, pictographs, graphics, and awareness training.

Signs

Warning signs that demarcate the regulated area will be provided and displayed at each location where a regulated area is required. Signs will be posted at such a distance from such a location that an employee may read the signs and take necessary protective steps before entering the area marked by the signs.

The warning signs will bear the following information.

- DANGER
- ASBESTOS
- CANCER AND LUNG DISEASE HAZARD
- AUTHORIZED PERSONNEL ONLY

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In addition, where the use of respirators and protective clothing is required in the regulated area under this section, the warning signs will include the following:

- RESPIRATORS AND PROTECTION CLOTHING ARE REQUIRED IN THIS AREA

Midland Engineering Co., Inc. will ensure that employees working in and contiguous to regulated areas comprehend the warning signs. Means to ensure employee comprehension may include the use of foreign languages, pictographs, graphics, and awareness training.

### Labels

Labels will be affixed to all products containing asbestos and to all containers containing such products, including waste containers, where feasible, installed asbestos products will contain a visible label. Labels will be printed in large, bold letters on a contrasting background. Labels will be used in accordance with the requirements of 29 CFR 1910.1200(f) of OSHA's Hazard Communication standard, and will contain the following information:

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

Labels will contain a warning statement against breathing asbestos fibers.

The provisions for required labels required do not apply where:

- Asbestos fibers have been modified by a bonding agent, coating, binder, or other material, provided that the manufacturer can demonstrate that, during any reasonably foreseeable use, handling, storage, disposal, processing, or transportation, no airborne concentrations of asbestos fibers in excess of the permissible exposure limit and/or excursion limit will be released, or
- Asbestos is present in a product in concentrations less than 1.0 percent.
- When a building owner or employer identifies previously installed PACM and/or ACM, labels or signs will be affixed or posted so that employees will be notified of what materials contain PACM and/or ACM. Midland Engineering Co., Inc. will attach such labels in areas where they will clearly be noticed by employees who are likely to be exposed, such as at the entrance to mechanical room/areas. Required signs may be posted in lieu of labels so long as they contain information required for labeling. Midland Engineering Co., Inc. will ensure, to the extent feasible, that employees who come in contact with these signs or labels can comprehend them. Means to ensure employee comprehension may include the use of foreign languages, pictographs, graphics, and awareness training.



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### Employee Information and Training

Midland Engineering Co., Inc. will train each employee who is likely to be exposed in excess of a PEL, and each employee who performs Class I through IV asbestos operations, in accordance with the requirements of this section. Such training will be conducted at no cost to the employee. Midland Engineering Co., Inc. will institute a training program and ensure employee participation in the program. Training will be provided prior to or at the time of initial assignment and at least annually thereafter. Training for Class I operations and for Class II operations that require the use of critical barriers (or equivalent isolation methods) and/or negative pressure enclosures under this section will be the equivalent in curriculum, training method and length to the EPA Model Accreditation Plan (MAP) asbestos abatement workers training (40 CFR Part 763, subpart E, appendix C).

#### Training for other Class II work.

- For work with asbestos containing roofing materials, flooring materials, siding materials, ceiling tiles, or transite panels, training will include at a minimum all the elements included in this section and in addition, the specific work practices and engineering controls set forth in paragraph Methods of Compliance of this section which specifically relate to that category. Such course will include "hands-on" training and will take at least 8 hours.
- An employee who works with more than one of the categories of material specified in this section will receive training in the work practices applicable to each category of material that the employee removes and each removal method that the employee uses.
- For Class II operations not involving the categories of material specified in this section, training will be provided which will include at a minimum all the elements included in this section and in addition, the specific work practices and engineering controls set forth in the Methods of Compliance in this program which specifically relate to the category of material being removed, and will include "hands-on" training in the work practices applicable to each category of material that the employee removes and each removal method that the employee uses.

Training for Class III employees will be consistent with EPA requirements for training of local education agency maintenance and custodial staff as set forth at 40 CFR 763.92(a)(2). Such a course will also include "hands-on" training and will take at least 16 hours. Exception: For Class III operations for which the competent person determines that the EPA curriculum does not adequately cover the training needed to perform that activity, training will include as a minimum all the elements included in this section and in addition, the specific work practices and engineering controls set forth in the Methods of Compliance in this program which specifically relate to that activity, and will include "hands-on" training in the work practices applicable to each category of material that the employee disturbs.

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Training for employees performing Class IV operations will be consistent with EPA requirements for training of local education agency maintenance and custodial staff as set forth at 40 CFR 763.92(a)(1). Such a course will include available information concerning the locations of thermal system insulation and surfacing ACM/PACM, and asbestos-containing flooring material, or flooring material where the absence of asbestos has not yet been certified; and instruction in recognition of damage, deterioration, and delamination of asbestos containing building materials. Such course will take at least 2 hours.

Training for employees who are likely to be exposed in excess of the PEL and who are not otherwise required to be trained, will meet the following requirements.

- The training program will be conducted in a manner that the employee is able to understand. In addition Midland Engineering Co., Inc. will ensure that each such employee is informed of the following:
- Methods of recognizing asbestos, including the requirement in the Methods of Compliance in this section to presume that certain building materials contain asbestos;
- The health effects associated with asbestos exposure;
- The relationship between smoking and asbestos in producing lung cancer;
- The nature of operations that could result in exposure to asbestos, the importance of necessary protective controls to minimize exposure including, as applicable, engineering controls, work practices, respirators, housekeeping procedures, hygiene facilities, protective clothing, decontamination procedures, emergency procedures, and waste disposal procedures, and any necessary instruction in the use of these controls and procedures; where Class III and IV work will be or is performed, the contents of EPA 20T-2003, "Managing Asbestos In-Place" July 1990 or its equivalent in content;
- The purpose, proper use, fitting instructions, and limitations of respirators as required by 29 CFR 1910.134;
- The appropriate work practices for performing the asbestos job;
- Medical surveillance program requirements;
- The content of this standard including appendices;
- The names, addresses and phone numbers of public health organizations which provide information, materials and/or conduct programs concerning smoking cessation.
- The requirements for posting signs and affixing labels and the meaning of the required legends for such signs and labels.

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- Access to training materials.

Midland Engineering Co., Inc. will make readily available to affected employees without cost, written materials relating to the employee training program, including a copy of this regulation. Midland Engineering Co., Inc. will provide to the Assistant Secretary and the Director, upon request, all information and training materials relating to the employee information and training program. Midland Engineering Co., Inc. will inform all employees concerning the availability of self-help smoking cessation program material. Upon employee request, Midland Engineering Co., Inc. will distribute such material, consisting of NIH Publication No, 89-1647, or equivalent self-help material.

## HOUSEKEEPING

### Vacuuming

Where vacuuming methods are selected, HEPA filtered vacuuming equipment must be used. The equipment will be used and emptied in a manner that minimizes the reentry of asbestos into the workplace.

### Waste disposal

Asbestos waste, scrap, debris, bags, containers, equipment, and contaminated clothing consigned for disposal will be collected and disposed of in sealed, labeled, impermeable bags or other closed, labeled, impermeable containers except in roofing operations.

### Care of Asbestos-Containing Flooring Material

All vinyl and asphalt flooring material will be maintained in accordance with this paragraph unless the building/facility owner demonstrates that the flooring does not contain asbestos. Sanding of flooring material is prohibited. Stripping of finishes will be conducted using low abrasion pads at speeds lower than 300 rpm and wet methods.

Burnishing or dry buffing may be performed only on flooring which has sufficient finish so that the pad cannot contact the flooring material. Waste and debris and accompanying dust in an area containing accessible thermal system insulation or surfacing ACM/PACM or visibly deteriorated ACM:

- will not be dusted or swept dry, or vacuumed without using a HEPA filter;
- will be promptly cleaned up and disposed of in leak tight containers.

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## MEDICAL SURVEILLANCE

### General

- Employees covered.
  - Midland Engineering Co., Inc. will institute a medical surveillance program for all employees who for a combined total of 30 or more days per year are engaged in Class I, II and III work or are exposed at or above a permissible exposure limit. For purposes of this paragraph, any day in which a worker engages in Class II or Class III operations or a combination thereof on intact material for one hour or less (taking into account the entire time spent on the removal operation, including cleanup) and, while doing so, adheres fully to the work practices specified in this standard, will not be counted.
  - For employees otherwise required by this standard to wear a negative pressure respirator, employers will ensure employees are physically able to perform the work and use the equipment. This determination will be made under the supervision of a physician.
  
- Examination
  - Midland Engineering Co., Inc. will ensure that all medical examinations and procedures are performed by or under the supervision of a licensed physician, and are provided at no cost to the employee and at a reasonable time and place.
  - Persons other than such licensed physicians who administer the pulmonary function testing required by this section will complete a training course in spirometry sponsored by an appropriate academic or professional institution.
  
- Medical Examinations and Consultations
  - Frequency.
    - Midland Engineering Co., Inc. will make available medical examinations and consultations to each employee covered under this section on the following schedules:
      - ❖ Prior to assignment of the employee to an area where negative-pressure respirators are worn;
      - ❖ When the employee is assigned to an area where exposure to asbestos may be at or above the permissible exposure limit for 30 or more days per year, or engage in Class I, II, or III work for a combined total of 30 or more days per year, a medical examination must be given within 10 working days following the thirtieth day of exposure;
      - ❖ And at least annually thereafter.
    - If the examining physician determines that any of the examinations should be provided more frequently than specified, Midland Engineering Co., Inc. will provide such examinations to affected employees at the frequencies specified by the physician.
    - Exception: No medical examination is required of any employee if adequate records show that the employee has been examined in accordance with this paragraph within the past 1-year period.

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## Content

Medical examinations made available will include:

- A medical and work history with special emphasis directed to the pulmonary, cardiovascular, and gastrointestinal systems.
- On initial examination, the standardized questionnaire contained in Part 1 of of this program, and, on annual examination, the abbreviated standardized questionnaire contained in Part 2 of this program.
- A physical examination directed to the pulmonary and gastrointestinal systems, including a chest roentgenogram to be administered at the discretion of the physician, and pulmonary function tests of forced vital capacity (FVC) and forced expiratory volume at one second (FEV(1)). Interpretation and classification of chest will be conducted in accordance with Appendix E to this section.
- Any other examinations or tests deemed necessary by the examining physician.

## Information provided to the physician.

Midland Engineering Co., Inc. will provide the following information to the examining physician:

- A copy of this standard and the Medical Questionnaire to this section;
- A description of the affected employee's duties as they relate to the employee's exposure;
- The employee's representative exposure level or anticipated exposure level;
- A description of any personal protective and respiratory equipment used or to be used; and
- Information from previous medical examinations of the affected employee that is not otherwise available to the examining physician.

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Physician's written opinion

Midland Engineering Co., Inc. will obtain a written opinion from the examining physician. This written opinion will contain the results of the medical examination and will include:

- The physician's opinion as to whether the employee has any detected medical conditions that would place the employee at an increased risk of material health impairment from exposure to asbestos;
- Any recommended limitations on the employee or on the use of personal protective equipment such as respirators; and
- A statement that the employee has been informed by the physician of the results of the medical examination and of any medical conditions that may result from asbestos exposure.
- A statement that the employee has been informed by the physician of the increased risk of lung cancer attributable to the combined effect of smoking and asbestos exposure.
- Midland Engineering Co., Inc. will instruct the physician not to reveal in the written opinion given to Midland Engineering Co., Inc. specific findings or diagnoses unrelated to occupational exposure to asbestos.
- Midland Engineering Co., Inc. will provide a copy of the physician's written opinion to the affected employee within 30 days from its receipt.

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## RECORDKEEPING

Objective data relied on as described in the Exposure Assessments and Monitoring section of this program. Where Midland Engineering Co., Inc. has relied on objective data that demonstrates that products made from or containing asbestos or the activity involving such products or material are not capable of releasing fibers of asbestos in concentrations at or above the permissible exposure limit and/or excursion limit under the expected conditions of processing, use, or handling to satisfy the requirements of Exposure Assessments and Monitoring, Midland Engineering Co., Inc. will establish and maintain an accurate record of objective data reasonably relied upon in support of the exemption.

The record will include at least the following information:

- The product qualifying for exemption;
- The source of the objective data;
- The testing protocol, results of testing, and/or analysis of the material for the release of asbestos;
- A description of the operation exempted and how the data support the exemption; and
- Other data relevant to the operations, materials, processing, or employee exposures covered by the exemption.

Midland Engineering Co., Inc. will maintain this record for the duration of Midland Engineering Co., Inc.'s reliance upon such objective data.

### Exposure Measurements

Midland Engineering Co., Inc. will keep an accurate record of all measurements taken to monitor employee exposure to asbestos as described in the Exposure Assessments and Monitoring section of this program. NOTE: Midland Engineering Co., Inc. may utilize the services of competent organizations such as industry trade associations and employee associations to maintain the records required by this section.

This record will include at least the following information:

- The date of measurement;
- The operation involving exposure to asbestos that is being monitored;
- Sampling and analytical methods used and evidence of their accuracy;
- Number, duration, and results of samples taken;
- Type of protective devices worn, if any; and

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- Name, social security number, and exposure of the employees whose exposures are represented.

Midland Engineering Co., Inc. will maintain this record for at least thirty (30) years, in accordance with 29 CFR 1910.20.

#### Medical Surveillance

Midland Engineering Co., Inc. will establish and maintain an accurate record for each employee subject to medical surveillance, in accordance with 29 CFR 1910.20.

The record will include at least the following information:

- The name and social security number of the employee;
- A copy of the employee's medical examination results, including the medical history, questionnaire responses, results of any tests, and physician's recommendations.
- Physician's written opinions;
- Any employee medical complaints related to exposure to asbestos; and
- A copy of the information provided to the physician as required by this section.

Midland Engineering Co., Inc. will ensure that this record is maintained for the duration of employment plus thirty (30) years, in accordance with 29 CFR 1910.20.

#### Training Records

Midland Engineering Co., Inc. will maintain all employee training records for one (1) year beyond the last date of employment by that employer.

#### Data to Rebut PACM

Where the building owner and Midland Engineering Co., Inc. have relied on data to demonstrate that PACM is not asbestos-containing, such data will be maintained for as long as they are relied upon to rebut the presumption.

#### Records of Required Notifications

Where the building owner has communicated and received information concerning the identification, location and quantity of ACM and PACM, written records of such notifications and their content will be maintained by the building owner for the duration of ownership and will be transferred to successive owners of such buildings/facilities.

#### Availability.

Midland Engineering Co., Inc., upon written request, will make all records required to be maintained by this section available to the Assistant Secretary and the Director for examination and copying.



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Midland Engineering Co., Inc., upon request, will make any exposure records required by this program available for examination and copying to affected employees, former employees, designated representatives, and the Assistant Secretary, in accordance with 29 CFR 1910.20(a) through (e) and (g) through (i).

Midland Engineering Co., Inc., upon request, will make employee medical records required by this program available for examination and copying to the subject employee, anyone having the specific written consent of the subject employee, and the Assistant Secretary, in accordance with 29 CFR 1910.20.

#### Transfer of Records

Midland Engineering Co., Inc. will comply with the requirements concerning transfer of records set forth in 29 CFR 1910.20(h).

Whenever Midland Engineering Co., Inc. ceases to do business and there is no successor employer to receive and retain the records for the prescribed period, Midland Engineering Co., Inc. will notify the Director at least 90 days prior to disposal and, upon request, transmit them to the Director.

## COMPETENT PERSON

### General

On all construction worksites covered by this standard, Midland Engineering Co., Inc. will designate a competent person, having the qualifications and authorities for ensuring worker safety and health required by Subpart C, General Safety and Health Provisions for Construction (29 CFR 1926.20 through 1926.32).

### Required Inspections by the Competent Person

Section 1926.20(b)(2) which requires health and safety prevention programs to provide for frequent and regular inspections of the job sites, materials, and equipment to be made by competent persons, is incorporated.

### Additional Inspections

In addition, the competent person will make frequent and regular inspections of the job sites, in order to perform the duties set out below. For Class I jobs, on-site inspections will be made at least once during each work shift, and at any time at employee request. For Class II, III, and IV jobs, on-site inspections will be made at intervals sufficient to assess whether conditions have changed, and at any reasonable time at employee request.

On all worksites where employees are engaged in Class I or II asbestos work, the competent person will perform or supervise the following duties, as applicable:

- Set up the regulated area, enclosure, or other containment;
- Ensure (by on-site inspection) the integrity of the enclosure or containment;

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- Set up procedures to control entry to and exit from the enclosure and/or area;
- Supervise all employee exposure monitoring required by this section and ensure that it is conducted as required by the Exposure Assessment and Monitoring section of this program;
- Ensure that employees working within the enclosure and/or using glove bags wear respirators and protective clothing as required
- Ensure through on-site supervision, that employees set up, use and remove engineering controls, use work practices and personal protective equipment in compliance with all requirements;
- Ensure that employees use the hygiene facilities and observe the decontamination procedures specified in Hygiene Facilities and Practices for Employees;
- Ensure that through on-site inspection, engineering controls are functioning properly and employees are using proper work practices; and,
- Ensure that notification requirements in the Communication of Hazards of this program are met.

#### Training for the Competent Person

For Class I and II asbestos work the competent person will be trained in all aspects of asbestos removal and handling, including: abatement, installation, removal and handling; the contents of this standard; the identification of asbestos; removal procedures, where appropriate; and other practices for reducing the hazard. Such training will be obtained in a comprehensive course for supervisors that meets the criteria of EPA's Model Accredited Plan (40 CFR part 763, subpart E, Appendix C), such as a course conducted by an EPA-approved or state-approved training provider, certified by EPA or a state, or a course equivalent in stringency, content, and length.

For Class III and IV asbestos work, the competent person will be trained in aspects of asbestos handling appropriate for the nature of the work, to include procedures for setting up glove bags and mini-enclosures, practices for reducing asbestos exposures, use of wet methods, the contents of this standard, and the identification of asbestos. Such training will include successful completion of a course that is consistent with EPA requirements for training of local education agency maintenance and custodial staff as set forth at 40 CFR 763.92(a)(2), or its equivalent in stringency, content, and length. Competent persons for Class III and IV work, may also be trained pursuant to the requirements of this program.



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## OCCUPATIONAL HISTORY

17.

A. Have you ever worked full time (30 hours per week or more) for 6 months or more?

1. Yes                      2. No

IF YES TO 17A:

B. Have you ever worked for a year or more in any dusty job?

1. Yes                      2. No                      3. Does Not Apply

Specify job/industry \_\_\_\_\_ Total Years Worked \_\_\_\_\_

Was dust exposure:

1. Mild                      2. Moderate                      3. Severe

C. Have you ever been exposed to gas or chemical fumes in your work?

1. Yes                      2. No

Specify job/industry \_\_\_\_\_ Total Years Worked \_\_\_\_\_

Was exposure :

1. Mild                      2. Moderate                      3. Severe

D. What has been your usual occupation or job – the one you have worked at the longest?

1. Job occupation \_\_\_\_\_
2. Number of years employed in this occupation \_\_\_\_\_
3. Position/job title \_\_\_\_\_
4. Business, field or industry \_\_\_\_\_

(Record on lines the years in which you have worked in any of these industries, e.g. 1960-1969)

Have you ever worked:	YES	NO
E. In a mine? .....	_____	_____
F. In a quarry? .....	_____	_____
G. In a foundry? .....	_____	_____
H. In a pottery? .....	_____	_____
I. In a cotton, flax or hemp mill? .....	_____	_____

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J. With asbestos?..... \_\_\_\_\_

18. PAST MEDICAL HISTORY

YES NO

A. Do you consider yourself to be in good health? \_\_\_\_\_

If "NO" state reason \_\_\_\_\_

B. Have you any defect of vision? ..... \_\_\_\_\_

If "YES" state nature of defect \_\_\_\_\_

C. Have you any hearing defect? ..... \_\_\_\_\_

If "YES" state nature of defect \_\_\_\_\_

D. Are you suffering from or have you ever suffered from:

YES NO

a. Epilepsy (or fits, seizures, convulsions)? \_\_\_\_\_

b. Rheumatic fever? \_\_\_\_\_

c. Kidney disease? \_\_\_\_\_

d. Bladder disease? \_\_\_\_\_

e. Diabetes? \_\_\_\_\_

f. Jaundice? \_\_\_\_\_

19. CHEST COLDS AND CHEST ILLNESSES

19

A. If you get a cold, does it "usually" go to your chest? (Usually means more than 1/2 the time)

1. Yes                      2. No                      3. Don't Get Colds

20

A. During the past 3 years, have you had any chest illnesses that have kept you off work, indoors at home, or in bed?

1. Yes                      2. No

IF YES TO 20A:

B. Did you produce phlegm with any of these chest illnesses?

1. Yes                      2. No                      3. Does Not Apply

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C. In the last 3 years, how many such illnesses with (increased) phlegm did you have which lasted a week or more?

Number of illnesses \_\_\_\_\_ No such illnesses \_\_\_\_\_

21. Did you have any lung trouble before the age of 16?

1. Yes                      2. No

22. Have you ever had any of the following?

1A. Attacks of bronchitis?

1. Yes                      2. No

IF YES TO 1A:

B. Was it confirmed by a doctor?

1. Yes                      2. No                      3. Does Not Apply

C. At what age was your first attack?

Age in Years \_\_\_\_\_ Does Not Apply

2A. Pneumonia (include bronchopneumonia)?

1. Yes                      2. No

IF YES TO 2A:

B. Was it confirmed by a doctor?

1. Yes                      2. No                      3. Does Not Apply

C. At what age was your first attack?

Age in Years \_\_\_\_\_ Does Not Apply

3A. Hay Fever?

1. Yes                      2. No

IF YES TO 3A:

B. Was it confirmed by a doctor?

1. Yes                      2. No                      3. Does Not Apply

C. At what age was your first attack?

Age in Years \_\_\_\_\_ Does Not Apply

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23 A. Have you ever had chronic bronchitis?

1. Yes                      2. No

IF YES TO 23A:

B. Do you still have it?

1. Yes                      2. No                      3. Does Not Apply

C. Was it confirmed by a doctor?

1. Yes                      2. No                      3. Does Not Apply

D. At what age did it start?

Age in Years \_\_\_\_\_ Does Not Apply

24A. Have you ever had emphysema?

1. Yes                      2. No

IF YES TO 24A:

B. Do you still have it?

1. Yes                      2. No                      3. Does Not Apply

C. Was it confirmed by a doctor?

1. Yes                      2. No                      3. Does Not Apply

D. At what age did it start?

Age in Years \_\_\_\_\_ Does Not Apply

25A. Have you ever had asthma?

1. Yes                      2. No

IF YES TO 25A:

B. Do you still have it?

1. Yes                      2. No                      3. Does Not Apply

C. Was it confirmed by a doctor?

1. Yes                      2. No                      3. Does Not Apply

D. At what age did it start?

Age in Years \_\_\_\_\_ Does Not Apply

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E. If you no longer have it, at what age did it stop?

Age Stopped \_\_\_\_\_ Does Not Apply

26. Have you ever had:

A. Any other chest illness? 1. Yes 2. No

If yes, please specify \_\_\_\_\_

B. Any chest operations? 1. Yes 2. No

If yes, please specify \_\_\_\_\_

C. Any chest injuries? 1. Yes 2. No

If yes, please specify \_\_\_\_\_

27A. Has a doctor ever told you that you had heart trouble?

1. Yes 2. No

IF YES TO 27A:

B. Have you ever had treatment for heart trouble in the past 10 years?

1. Yes 2. No 3. Does Not Apply

28A. Has a doctor told you that you had high blood pressure?

1. Yes 2. No

IF YES TO 28A:

B. Have you had any treatment for high blood pressure (hypertension) in the past 10 years?

1. Yes 2. No 3. Does Not Apply

29. When did you last have your chest X-rayed?

(Year) \_\_\_\_ \_\_\_\_ \_\_\_\_ \_\_\_\_

30. Where did you last have your chest X-rayed (if known)?

\_\_\_\_\_

What was the outcome? \_\_\_\_\_



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FAMILY HISTORY

31. Were either of your natural parents ever told by a doctor that they had a chronic lung condition such as:

FATHER

MOTHER

1. Yes 2. No 3. Don't Know

1. Yes 2. No 3. Don't Know

A. Chronic Bronchitis?

\_\_\_\_\_

B. Emphysema?

\_\_\_\_\_

C. Asthma?

\_\_\_\_\_

D. Lung cancer?

\_\_\_\_\_

E. Other chest conditions?

\_\_\_\_\_

F. Is parent currently alive?

\_\_\_\_\_

G. Please Specify

\_\_\_\_\_ Age if Living

\_\_\_\_\_ Age if Living

\_\_\_\_\_ Age at Death

\_\_\_\_\_ Age at Death

\_\_\_\_\_ Don't Know

\_\_\_\_\_ Don't Know

H. Please specify cause of death

\_\_\_\_\_

COUGH

32A. Do you usually have a cough? (Count a cough with first smoke or on first going out of doors. Exclude clearing of throat.)

(If no, skip to question 32C.)

1. Yes

2. No

B. Do you usually cough as much as 4 to 6 times a day 4 or more days out of the week?

1. Yes

2. No

C. Do you usually cough at all on getting up or first thing in the morning?

1. Yes

2. No

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D. Do you usually cough at all during the rest of the day or at night?

1. Yes                      2. No

IF YES TO ANY OF ABOVE (32A, B, C, OR D,), ANSWER THE FOLLOWING.

IF NO TO ALL, CIRCLE "DOES NOT APPLY" AND SKIP TO NEXT PAGE

E. Do you usually cough like this on most days for 3 consecutive months or more during the year?

1. Yes                      2. No                      3. Does Not Apply

F. For how many years have you had the cough?

Number of Years \_\_\_\_\_ Does Not Apply

33A. Do you usually bring up phlegm from your chest? (Count phlegm with the first smoke or on first going out of doors. Exclude phlegm from the nose. Count swallowed phlegm.)  
(If no, skip to 33C)

1. Yes                      2. No

B. Do you usually bring up phlegm like this as much as twice a day 4 or more days out of the week?

1. Yes                      2. No

C. Do you usually bring up phlegm at all on getting up or first thing in the morning?

1. Yes                      2. No

D. Do you usually bring up phlegm at all on during the rest of the day or at night?

1. Yes                      2. No

IF YES TO ANY OF THE ABOVE (33A, B, C, OR D), ANSWER THE FOLLOWING:

IF NO TO ALL, CIRCLE "DOES NOT APPLY" AND SKIP TO 34A

E. Do you bring up phlegm like this on most days for 3 consecutive months or more during the year?

1. Yes                      2. No                      3. Does Not Apply

F. For how many years have you had trouble with phlegm?

Number of Years \_\_\_\_\_ Does Not Apply

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EPISODES OF COUGH AND PHLEGM

34A. Have you had periods or episodes of (increased\*) cough and phlegm lasting for 3 weeks or more each year?  
\* (For persons who usually have cough and/or phlegm)

1. Yes                      2. No

IF YES TO 34A

B. For how long have you had at least 1 such episode per year?

Number of Years \_\_\_\_\_ Does Not Apply

WHEEZING

35A. Does your chest ever sound wheezy or whistling

1. When you have a cold?                      1. Yes                      2. No
2. Occasionally apart from colds?                      1. Yes                      2. No
3. Most days or nights?                      1. Yes                      2. No

IF YES TO 1, 2, or 3 in 35A

B. For how many years has this been present?

Number of Years \_\_\_\_\_ Does Not Apply

36A. Have you ever had an attack of wheezing that has made you feel short of breath?

1. Yes                      2. No

IF YES TO 36A

B. How old were you when you had your first such attack?

Age in Years \_\_\_\_\_ Does Not Apply

C. Have you had 2 or more such episodes?

1. Yes                      2. No                      3. Does Not Apply

D. Have you ever required medicine or treatment for the(se) attack(s)?

1. Yes                      2. No                      3. Does Not Apply

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**BREATHLESSNESS**

37. If disabled from walking by any condition other than heart or lung disease, please describe and proceed to question 39A.

Nature of condition(s) \_\_\_\_\_

38A. Are you troubled by shortness of breath when hurrying on the level or walking up a slight hill?

1. Yes                      2. No

IF YES TO 38A

B. Do you have to walk slower than people of your age on the level because of breathlessness?

1. Yes                      2. No                      3. Does Not Apply

C. Do you ever have to stop for breath when walking at your own pace on the level?

1. Yes                      2. No                      3. Does Not Apply

D. Do you ever have to stop for breath after walking about 100 yards (or after a few minutes) on the level?

1. Yes                      2. No                      3. Does Not Apply

E. Are you too breathless to leave the house or breathless on dressing or climbing one flight of stairs?

1. Yes                      2. No                      3. Does Not Apply

**TOBACCO SMOKING**

39A. Have you ever smoked cigarettes? (No means less than 20 packs of cigarettes or 12 oz. of tobacco in a lifetime or less than 1 cigarette a day for 1 year.)

1. Yes                      2. No

IF YES TO 39A

B. Do you now smoke cigarettes (as of one month ago)

1. Yes                      2.

C. How old were you when you first started regular cigarette smoking?

Age in Years \_\_\_\_\_ Does Not Apply

D. If you have stopped smoking cigarettes completely, how old were you when you stopped?

Age Stopped \_\_\_\_\_ Check if still smoking                      Does Not Apply

E. How many cigarettes do you smoke per day now?

Cigarettes per Day \_\_\_\_\_ Does Not Apply

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F. On the average of the entire time you smoked, how many cigarettes did you smoke per day?

Cigarettes per Day \_\_\_\_\_ Does Not Apply

G. Do or did you inhale the cigarette smoke?

1. Does not apply \_\_\_\_\_
2. Not at all \_\_\_\_\_
3. Slightly \_\_\_\_\_
4. Moderately \_\_\_\_\_
5. Deeply \_\_\_\_\_

40A. Have you ever smoked a pipe regularly? (Yes means more than 12 oz. of tobacco in a lifetime.)

1. Yes
2. No

IF YES TO 40A:  
FOR PERSONS WHO HAVE EVER SMOKED A PIPE

B. 1. How old were you when you started to smoke a pipe regularly?

Age \_\_\_\_\_

2. If you have stopped smoking a pipe completely, how old were you when you stopped?

Age stopped \_\_\_\_\_ Check if still smoking pipe \_\_\_\_\_ Does Not Apply

C. On the average over the entire time you smoked a pipe, how much pipe tobacco did you smoke per week?

\_\_\_\_\_ oz. per week Does Not Apply  
(a standard pouch of tobacco contains 1 1/2 oz.)

D. How much pipe tobacco are you smoking now?

\_\_\_\_\_ oz. per week Not currently smoking a pipe\_\_

E. Do you or did you inhale the pipe smoke?

1. Never Smoked \_\_\_\_\_
2. Not at all \_\_\_\_\_
3. Slightly \_\_\_\_\_
4. Moderately \_\_\_\_\_
5. Deeply \_\_\_\_\_

41A. Have you ever smoked cigars regularly?

1. Yes
2. No

(Yes means more than 1 cigar a week for a year)

IF YES TO 41A

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FOR PERSONS WHO HAVE EVER SMOKED A CIGARS

B. 1. How old were you when you started smoking cigars regularly?

Age \_\_\_\_\_

2. If you have stopped smoking cigars completely, how old were you when you stopped.

Age stopped \_\_\_\_\_ Check if still smoking cigars \_\_\_\_\_ Does Not Apply

C. On the average over the entire time you smoked cigars, how many cigars did you smoke per week?

Cigars per Week \_\_\_\_\_ Does Not Apply

D. How many cigars are you smoking per week now? Cigars per week \_\_\_\_\_

Cigars per Week \_\_\_\_\_ Check if not smoking cigars currently \_\_\_\_\_

E. Do or did you inhale the cigar smoke?

- 1. Never Smoked \_\_\_\_\_
- 2. Not at all \_\_\_\_\_
- 3. Slightly \_\_\_\_\_
- 4. Moderately \_\_\_\_\_
- 5. Deeply \_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_

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## Part 2 PERIODIC MEDICAL QUESTIONNAIRE

1. NAME \_\_\_\_\_

2. SOCIAL SECURITY # \_\_\_\_\_

3. CLOCK NUMBER \_\_\_\_\_

4. PRESENT OCCUPATION \_\_\_\_\_

5. PLANT \_\_\_\_\_

6. ADDRESS \_\_\_\_\_

7. \_\_\_\_\_  
(Zip Code)

8. TELEPHONE NUMBER \_\_\_\_\_

9. INTERVIEWER \_\_\_\_\_

10. DATE \_\_\_\_\_

11. What is your marital status?

1. Single      2. Married      3. Widowed      4. Separated/Divorced

12. OCCUPATIONAL HISTORY

12A. In the past year, did you work full time (30 hours per week or more) for 6 months or more?

1. Yes      2. No

IF YES TO 12A:

12B. In the past year, did you work in a dusty job?

1. Yes      2. No      3. Does Not Apply

12C. Was dust exposure:

1. Mild      2. Moderate      3. Severe

12D. In the past year, were you exposed to gas or chemical fumes in your work?

1. Yes      2. No

12E. Was exposure:

1. Mild      2. Moderate      3. Severe

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12F. In the past year, what was your:

1. Job/occupation? \_\_\_\_\_

2. Position/job title? \_\_\_\_\_

13. RECENT MEDICAL HISTORY

13A. Do you consider yourself to be in good health?

1. Yes

2. No

If NO, state reason \_\_\_\_\_

13B. In the past year, have you developed:                      Yes                      No

Epilepsy?	_____	_____
Rheumatic fever?	_____	_____
Kidney disease?	_____	_____
Bladder disease?	_____	_____
Diabetes?	_____	_____
Jaundice?	_____	_____
Cancer?	_____	_____

14. CHEST COLDS AND CHEST ILLNESSES

14A. If you get a cold, does it "usually" go to your chest? (usually means more than 1/2 the time)

1. Yes

2. No

3. Don't Get Colds

15A. During the past year, have you had any chest illnesses that have kept you off work, indoors at home, or in bed?

1. Yes

2. No

3. Does Not Apply

IF YES TO 15A:

15B. Did you produce phlegm with any of these chest illnesses?

1. Yes

2. No

3. Does Not Apply

15C. In the past year, how many such illnesses with (increased) phlegm did you have which lasted a week or more?

Number of illnesses \_\_\_\_\_

No Such illnesses

16. RESPIRATORY SYSTEM

In the past year have you had:

Yes or No

Further Comment on Positive Answers

Asthma                      \_\_\_\_\_                      \_\_\_\_\_



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Bronchitis \_\_\_\_\_

Hay Fever \_\_\_\_\_

Other Allergies \_\_\_\_\_

	Yes or No	Further Comment on Positive Answers
Pneumonia	_____	_____

Tuberculosis	_____	_____
--------------	-------	-------

Chest Surgery	_____	_____
---------------	-------	-------

Other Lung Problems	_____	_____
---------------------	-------	-------

Heart Disease	_____	_____
---------------	-------	-------

Do you have:

	Yes or No	Further Comment on Positive Answers
Frequent colds	_____	_____

Chronic cough	_____	_____
---------------	-------	-------

Shortness of breath when walking or climbing one flight of stairs	_____	_____
---	-------	-------

Do you:

	Yes or No	Further Comment on Positive Answers
Wheeze	_____	_____

Cough up phlegm	_____	_____
-----------------	-------	-------

Smoke cigarettes	_____	Packs per day _____	How many years _____
------------------	-------	---------------------	----------------------

Date \_\_\_\_\_

Signature \_\_\_\_\_