

# Appendix 12B

## Asbestos

### Job Performance Requirements

### and

### Asbestos Glossary

This appendix contains the following attachments:

- 12A Class I Asbestos Work
- 12B Class II Asbestos Work
- 12C Class III Asbestos Work – Glovebag
- 12D Class III Asbestos Work – Regulated Area Defined by a Barricade with Floor Covering
- 12E Class III Asbestos Work – Regulated Area Defined by an Enclosure
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- 12H Custodial Work
- 12J Asbestos Glossary

## Attachment 12A

### Class I Asbestos Work

**Class I Asbestos Work:** Activities involving the removal of structural or ceiling Spray Applied Insulation (SAI), ceiling or acoustical decorative material, other surfacing material, or Thermal System Insulation (TSI) (i.e., piping and vessel insulation) that is considered Asbestos Containing Material (ACM) or is Presumed Asbestos Containing Material (PACM).

If you perform asbestos Class I abatement work involving the removal of equal to or more than 260 linear feet, 160 square feet, or 35 cubic feet of ACM or PACM, you shall (as required by Chapter 12.6):

- (i) Submit an asbestos project design
- (ii) Provide the JSC Environmental Office, at least 15 working days prior to beginning work, all information required to make notification to the TDSHS.

The JPR requirement descriptions listed in this attachment are the pre-approved project designs for asbestos Class I abatement activities involving less than 260 linear feet, 160 square feet, or 35 cubic feet of ACM or PACM.

**A decontamination area is required for Class I removal involving over 25 linear feet or 10 square feet of TSI or surfacing ACM and PACM (Reference: 29 CFR 1926.1101 (j)(1)).**

The decontamination area shall consist of an equipment room, shower area, and clean room in series. The asbestos workers shall enter and exit the regulated area through the decontamination area

**JPR I-1:** Removal of SAI, acoustical or decorative materials, or other surfacing material with a cumulative total of greater than or equal to ( $\geq$ ) 10 square feet but less than ( $<$ ) 160 square feet of materials that have been identified ACM or PACM. A decontamination area is required. **JPR I-2:** Removal of Thermal System Insulation (TSI) with a cumulative total of greater than or equal to ( $\geq$ ) 25 linear feet and less than ( $<$ ) 260 linear feet of materials that have been identified ACM or PACM. For vessels, a cumulative total of greater than or equal to ( $\geq$ ) 10 square feet but less than ( $<$ ) 160 square feet or less than ( $<$ ) 35 cubic feet of materials that have been identified ACM or PACM. Or, because of the size or geometry of the equipment involved, a glove bag is not a technically feasible method for removal. A decontamination area is required.

**JPR I-3:** Removal of Surfacing (Spray Applied Insulation (SAI) or acoustical) or other surfacing material of greater than or equal to ( $\geq$ ) 3 square feet of contiguous area and a cumulative total of spot removals less than ( $<$ ) 10 square feet cumulative of materials that have been identified ACM or PACM. A decontamination area is not required but may be used.

**JPR I-4:** Removal of Thermal System Insulation (TSI) of greater than or equal to ( $\geq$ ) 3 linear feet of contiguous area (one waste bag), and less than ( $<$ ) 25 linear feet of materials that have been identified ACM or PACM. For vessels, greater than or equal to ( $\geq$ ) 3 square feet of contiguous area, more than one spot abatement, more than one waste bag, and less than ( $<$ ) 10 square feet cumulative of materials that have been identified ACM or PACM. Never slide glovebags along piping. A decontamination area is not required but may be used.

## Attachment 12A

### Class I Asbestos Work (cont.)

To accomplish these Class I asbestos work activities, a number of sequential and concurrent steps are required. The most prominent of these are listed below. You will find specific details for performing all required activities by referring to accepted industry practices and procedures based on requirements found in 29 CFR 1926.1101, 29 CFR 1910.1001, and 40 CFR 763, as amended.

1. Ensure supervision by a properly qualified, competent person.
2. The assigned competent person shall verify training, medical, and PPE requirements for the asbestos workers are complete and current.
3. Notify and coordinate task with proper officials (facility manager, work area supervisor, OHD, Environmental Office as needed).
4. Notify OHD at least 2 weeks before job start to coordinate inspections and air sampling.
5. Establish regulated area, post warning signs, and rope off area with barricade tape.
6. Shut down and isolate the HVAC system. Control operation/energy with a JSC Form 19A, "WARNING – DO NOT OPERATE" tag.
7. Secure and isolate the electrical system and control its operation/energy with a JSC Form 19A, "WARNING – DO NOT OPERATE" tag. Disable the fire alarm systems as necessary and obtain approval for outages from the Fire Protection Coordination Office.
8. Clean and remove furniture and fixtures, if possible.
9. Pre-clean work area.
10. Seal stationary items, and any remaining furniture/fixtures, and surfaces with polyethylene.
11. Install containment system enclosure, critical barriers, floor coverings, and airlocks (airlocks are mandatory for large enclosures; a double entrance curtain ("Z" flap) is mandatory for small enclosures).
12. Secure work area.
13. Install decontamination area (equipment room, shower area, clean room) and waste load-out facilities, as required. .
14. Install negative-pressure air system (large-scale enclosure).
15. Install negative-pressure air or HEPA-vacuum system for negative pressure (small-scale enclosure).
16. Arrange for OHD to pre-inspect the enclosure.
17. Don protective equipment and clothing and respiratory protection.
18. Maintain HEPA vacuum system in standby mode (spot-removal surfacing).
19. Wet ACM.
20. Remove ACM

## **Attachment 12A**

### **Class I Asbestos Work (cont.)**

21. Conduct personnel and area sampling concurrently with removal of ACM.
22. Bag removed ACM.
23. Prepare bagged ACM for disposal. Decontaminate outside of bag.
24. Conduct cleaning and inspection following procedures in Chapter 12.
25. Arrange for OHD to perform initial inspection.
26. Re-clean, as necessary.
27. Conduct final cleanup following procedures in Chapter 12.
28. Apply encapsulant/“lockdown” to abatement and contiguous areas.
29. Arrange for OHD to conduct clearance visual inspection and clearance air sampling.
30. Decontaminate personnel and equipment by HEPA vacuum. Remove disposable protective clothing and bag as asbestos waste. Shower and exit through decontamination area as appropriate.
31. Disassemble enclosure/decontaminated system after approval from OHD.
32. Call Work Control Center to dispose of all ACM and asbestos-contaminated waste. Record Work Control Pickup Ticket number on Asbestos Work Permit.
33. Disestablish regulated area.
34. OHD to provide written notification to facility manager that area can be returned to routine activities.
35. Abatement contractor to write report/provide records to Environmental Office/Asbestos Program Manager, as required.

## Attachment 12B

### Class II Asbestos Work

**Class II Asbestos Work:** Removal of, or modification to, wallboard systems, asbestos concrete materials (e.g.; pipe, siding, roofing, transite board), ceiling tiles, wall tiles, floor tiles and sheeting, construction mastics, and roofing and siding shingles that are considered Asbestos Containing Material (ACM) or Presumed Asbestos Containing Material (PACM).

If you perform asbestos Class II abatement work involving the removal of equal to or greater than 160 square feet you shall (as required by Chapter 12.6):

- (i) Submit an asbestos project design
- (ii) Provide the JSC Environmental Office, at least 15 working days prior to beginning work, all information required to make notification to the TDSHS.

The JPR requirement descriptions listed in this attachment are the pre-approved project designs for asbestos Class II abatement activities involving less than 160 square feet of ACM or PACM.

Class II asbestos work operations, where exposures exceed a PEL, or where there is no negative exposure assessment approved by OHD before the operation starts, require an equipment room or area adjacent to the regulated area for the decontamination of employees and their equipment. The area shall be covered by a impermeable drop cloth on the floor or horizontal working surface and shall 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). (Reference 29 CFR 1926.1101(j)(2)).

Tasks under Class II consist of removing wallboard, asbestos concrete materials (e.g.; pipe, siding, roofing, transite board), ceiling tiles, wall tiles, floor tiles and sheeting, roofing, and siding shingles (i.e., ACM or PACM other than TSI and surfacing materials), regardless of quantity, where these materials have been identified as containing greater than 1% asbestos. Although these materials contain in excess of 1% asbestos, they are typically classified as non-friable. The removal of these materials is separated into two categories based on exposure plus two specific tasks for the removal of resilient flooring using RFCI methods.

**JPR II-1:** The first category is where work activities will destroy the integrity of the ACM and cause the release of asbestos fibers. The materials being removed constitute a significant source of ACM, and abatement could reasonably be expected to contaminate adjoining facilities and create airborne concentrations if proper controls are not followed. The airborne exposures are likely to exceed (>) 0.01 f/cc, or an approved negative exposure assessment is not available. These removal projects will require the use of small or large enclosures. Enclosures will require the use of an equipment room.

**JPR II-2:** The second category is where work activities will not compromise or damage the integrity of the ACM. The materials being removed do not constitute potentially significant airborne fibers if removed intact and controlled. The airborne exposures likely to be less than (<) 0.01 f/cc, or an approved negative exposure assessment is available. An enclosure may be necessary, but is not always required.

## Attachment 12B

### Class II Asbestos Work (cont.)

To accomplish these two categories of tasks, a number of sequential and concurrent steps are required. The most prominent of these are listed below. Find specific details for performing all required activities by referring to accepted industry practices and procedures based on requirements found in 29 CFR 1926.1101, 29 CFR 1910.1001, and 40 CFR 763, as amended.

1. Ensure supervision by a properly qualified, competent person.
2. The assigned competent person shall verify training, medical, and PPE requirements for the asbestos workers are complete and current.
3. Notify and coordinate task with proper officials (facility manager, work area supervisor, OHD, Environmental Office as needed).
4. For routine and scheduled O&M work, notify OHD at least 2 weeks before job start to coordinate inspections and air sampling.
5. Establish regulated area, post warning signs, and rope off area with barricade tape.
6. Shut down and isolate the HVAC system. Control operation/energy with a JSC Form 19A, "WARNING - DO NOT OPERATE" tag.
7. Secure and isolate the electrical system and control its operation/energy with a JSC Form 19A, "WARNING - DO NOT OPERATE" tag. Disable the fire alarm systems as necessary and obtain approval for outages from the Fire Protection Coordination Office.
8. Clean and remove furniture and fixtures.
9. Pre-clean work area.
10. Seal stationary items with polyethylene.
11. Install containment system, critical barriers, coverings, and airlocks (airlocks are mandatory for large enclosures; a double entrance curtain ("Z" flap) is mandatory for small enclosures).
12. Secure work area.
13. Install equipment room (as necessary).
14. Install negative-pressure air or HEPA-vacuum system for negative pressure (as necessary).
15. Arrange for the OHD to pre-inspect the enclosure.
16. Don protective equipment and clothing and respiratory protection.
17. Wet ACM.
18. Remove ACM.
19. Conduct personnel and area sampling concurrently with removal of ACM.
20. Bag removed ACM.
21. Prepare bagged ACM for disposal. Decontaminate outside of bag.
22. Conduct cleaning and inspection following procedures in Chapter 12.12.

## Attachment 12B

### Class II Asbestos Work (cont.)

23. Arrange for OHD to conduct initial visual inspection.
24. Re-clean, as necessary.
25. Conduct final cleanup following procedures in Chapter 12.12.
26. Apply encapsulant/“lockdown” to abatement and contiguous areas.
27. Arrange for OHD to conduct clearance visual inspection and clearance air sampling.
28. Decontaminate personnel and equipment by HEPA vacuum. Remove disposable protective clothing and bag as asbestos waste. Shower and exit through change room as appropriate.
29. Disassemble enclosure/decontamination system after approval from OHD.
30. Call Work Control Center to dispose of all ACM and asbestos-contaminated waste.
31. Disestablish regulated area. Record Work Control Pickup Ticket number on Asbestos Work Permit.
32. OHD to provide written notification to facility manager that area can be returned to routine activities.
33. Abatement contractor to write report/provide records to Environmental Office, as required.

**JPR II-3:** Removal of less than 160 square feet of resilient sheet flooring using methods and procedures specified by the RFCI to include: (i) ACM sheeting or (ii) sheeting with ACM backing felt or adhesive. Sheeting must be cut with a box-cutter or linoleum-knife into narrow strips and rolled up without breaking using wet methods. Since the removal of the resilient sheet flooring will most likely involve an entire room or rooms, critical barriers and entry curtains are mandatory, as is polyethylene sheeting on the lower half of the walls. If the RFCI procedures are not strictly followed, removal must be conducted under JPR II-1.

**JPR II-4:** Removal of resilient flooring using methods and procedures specified by the RFCI to include: (i) any ACM vinyl or asphalt tile or (ii) any vinyl or carpet tile with ACM mastic; where the area exceeds 40 ft<sup>2</sup>, or where waste will exceed the capacity of one standard glove bag, but involves less than 160 square feet. Critical barriers and entry curtains are mandatory, as is polyethylene sheeting on the lower half of the walls. Tiles must be removed **intact**. Removal procedures must not use spud bars or Mechanical chippers. If these conditions are not or cannot be met, removal must be conducted under JPR II-1.

The RFCI document “Recommended Work Practices for Removal of Resilient Floor Coverings” may be found at <http://www.rfci.com/index.php>. See the TDSHS statement concerning RFCI procedures at: <http://www.dshs.state.tx.us/asbestos/pdf/ARC022.pdf>. RFCI procedures prohibit sanding, sawing, drilling, grinding, abrasive blasting, bead blasting, dry sweeping, dry scraping, and mechanical chipping or pulverizing of resilient flooring, lining, backing felt, and adhesive materials.

## Attachment 12B

### Class II Asbestos Work (cont.)

To accomplish these two specific tasks, a number of sequential and concurrent steps are required. The most prominent of these are listed below. Workers will wear protective clothing and respiratory protection. Find specific details for performing all required activities by referring to the accepted RFCI industry practices and procedures.

1. Ensure supervision by a properly qualified, competent person.
2. The assigned competent person shall verify training, medical, and PPE requirements for the asbestos workers are complete and current.
3. Notify and coordinate task with proper officials (facility manager, work area supervisor, OHD, Environmental Office as needed).
4. For routine and scheduled O&M work, notify OHD at least 2 weeks before job start to coordinate inspections and air sampling.
5. Notify JSC Environmental Office (JE) at least 15 working days before the job if the project exceeds EPA (Clean Air Act/NESHAP) criteria of greater than 160 ft<sup>2</sup> for removal of ACM for them to make required regulatory notifications to the TDSHS.
6. Establish regulated area, post warning signs, and rope off area with barricade tape.
7. Clean and remove furniture and fixtures.
8. Pre-clean work area.
9. Seal stationary items with polyethylene.
10. Install containment system, critical barriers, coverings, and airlocks (airlocks are mandatory for large enclosures; a double entrance curtain ("Z" flap) is mandatory for small enclosures).
11. Secure work area.
12. Install equipment room (as necessary).
13. Install negative-pressure air or HEPA vacuum system for negative pressure (as necessary).
14. Arrange for the OHD to pre-inspect the regulated area.
15. Prepare amended water/detergent solution using RFCI directions.
16. Don protective equipment and clothing and respiratory protection.
17. Remove resilient sheet flooring using RFCI methods:
  - a. If sheeting is fully-adhered, cut into strips that are 4 to 8 in. wide. Use these narrow strips for the bonded areas/edges of peripherally adhered sheeting.
  - b. If sheeting has not adhered or is peripherally adhered, cut areas that are not bonded into strips that are 18 in. wide.
  - c. While one worker rolls up the strip, a second worker keeps the sheeting, and especially the backing felt, wet with water/detergent solution.

## Attachment 12B

### Class II Asbestos Work (cont.)

- d. For fully adhered sheeting, the backing felt will separate from the wear layer. If separation does not occur easily, use wet-scraping to achieve separation.
  - e. After removing a 12- to 18-in. width of sheeting, thoroughly saturate any residual backing felt and remove by wet-scraping. Rewet backing felt if water/detergent solution has not completely penetrated.
  - f. Place rolled-up flooring and wet backing felt into ACM waste bags.
  - g. After the 12- to 18-in. width is free of backing felt, HEPA-vacuum the cleaned area.
  - h. Repeat a–g, above, until sheeting and backing felt have been removed from the entire floor.
18. Remove floor tiles using RFCI methods:
- a. Wet floor tile with water/detergent solution.
  - b. Using one of the RFCI methods, carefully remove floor tiles one at a time, keeping them intact. The RFCI methods are:
    - Wet floor tile with water/detergent solution; work a short- or long-handled scraper beneath a floor tile to exert pressure in a twisting action.
    - Thoroughly heat tile with a hot air gun or radiant heat source to soften tile and adhesive, then remove by hand or with scraper.
    - Place removed tiles into ACM waste bags with water/detergent solution.
19. Remove carpet tiles that have been adhered to floor with ACM mastic. Pry or peel up carpet tiles, keep mastic wet with water/detergent solution. Place contaminated carpet tiles into ACM waste bags with water/detergent solution.
20. Remove residual ACM mastic using RFCI wet-scraping methods and/or adhesive solvents and place into ACM waste bags. RFCI methods allow the use of adhesive solvents with a slow-speed (i.e., less than 300 rpm) floor machine and a 3M black floor pad. If using an adhesive solvent, exhaust ventilation will be required.
21. Conduct personnel and area sampling concurrently with removal of ACM.
22. Prepare bagged ACM for disposal.
23. Conduct cleaning and inspection following procedures in Chapter 12.12.
24. Arrange for OHD to conduct initial visual inspection.
25. Re-clean, as necessary.
26. Conduct final cleanup following procedures in Chapter 12.12.
27. Arrange for OHD to conduct clearance visual inspection and clearance air sampling, as required.
28. Decontaminate personnel and equipment by HEPA vacuum. Remove disposable protective clothing and bag as asbestos waste.

## **Attachment 12B**

### **Class II Asbestos Work (cont.)**

29. Disassemble enclosure/decontamination system after approval from OHD.
30. Call Work Control Center to dispose of all ACM and asbestos-contaminated waste.
31. Disestablish regulated area. Record Work Control Pickup Ticket Number on Asbestos Work Permit.
32. OHD to provide written notification to facility manager that area can be returned to routine activities.
33. Abatement contractor to write report/provide records to Environmental Office, as required.

## Attachment 12C

### Class III Asbestos Work – Glovebag

**Class III Asbestos Work – Glovebag:** Removal of piping insulation using a glovebag to control the expected airborne asbestos.

**JPR III-1:** Removal or repair of ACM or PACM insulation of less than (<) 3 linear feet at a single spot from steam, chilled water, and hot water lines and valves. Waste is limited to the amount of ACM or PACM that can be safely contained within one glovebag or within one standard waste bag. This job consists of conducting repairs and maintenance to pipes, lines, and valves. To gain access to the defective part of the pipe, line, or valve, it may be necessary to remove asbestos insulation from the item. The normal high asbestos content of these materials makes it reasonable to expect airborne concentrations of asbestos in potentially significant levels when these materials are disturbed. If the item to be worked on is small enough to fit in a glovebag and there is sufficient room for tools and necessary manipulation, use the glovebag method.

If the operation cannot be conducted in one glovebag, or if the total asbestos waste exceeds the capacity of one glovebag or one standard asbestos disposal bag, the work must be done following procedures under Class I Asbestos Work, JPR I-2 or I-4.

Accomplishing this job requires a number of sequential and concurrent steps. The most prominent of these are listed below. Find specific details for performing all required activities by referring to accepted industry practices and procedures based on requirements found in 29 CFR 1926.1101, 29 CFR 1910.1001, and 40 CFR 763, as amended.

1. Ensure supervision by a properly qualified, competent person.
2. The assigned competent person shall verify that training, medical, and PPE requirements of the asbestos workers are complete and current.
3. Notify and coordinate job task with proper officials (facility manager, work area supervisor, and OHD).
4. Establish regulated area, post warning signs, and rope off area with barricade tape.
5. Secure electrical systems, if possible without undue disruption to work activities if in close proximity to work area. If necessary, disable fire alarm system by coordinating with the Fire Protection Coordination Office.
6. Pre-clean the work area.
7. Seal stationary items with polyethylene.
8. Cover surface areas under abatement area with 6-mil polyethylene.
9. Don protective equipment and clothing and respiratory protection.
10. Perform glovebag operations.
  - a. Install glovebag.
  - b. Establish containment negative-pressure air flow with HEPA vacuum.
  - c. Remove ACM using wet methods.

## **Attachment 12C**

### **Class III Asbestos Work – Glovebag (cont.)**

- d. Scrub and wipe down exposed piping/valves.
  - e. Use encapsulant or “lockdown” on abatement and contiguous areas.
  - f. Remove glovebag.
11. Clean area.
  12. Perform inspection and conduct final cleanup following procedures in Chapter 12.12.
  13. Decontaminate and remove protective equipment.
  14. Call Work Control Center to dispose of all ACM and ACM-contaminated materials.  
Record Work Control Pickup Ticket Number on Asbestos Work Permit.
  15. Disestablish regulated area.
  16. Notify facility manager of job completion.

## Attachment 12D

### Class III Asbestos Work – Regulated Area Defined By Barricade with Floor Covering

#### *Class III - Asbestos Work – Regulated Area Defined by: A Barricade With Floor Covering:*

This set of Class III Asbestos work requires a regulated area defined by barrier or tape and warning signs. The regulated area does not require an enclosure but does require appropriate covering of horizontal surfaces with polyethylene sheeting.

If at any time during the tasks described below, ACM is noted as delaminating or creating airborne fibers, stop the project and immediately upgrade it to Class I or Class II asbestos work.

#### **JPR III-2:** Activities which meet one or more of the following:

- a. Any entry into a ceiling plenum below surfacing or spray applied insulation/fireproofing (SAI) ACM or PACM where the ceiling opening is less than (<) 32 square feet;
- b. Any activity that disturbs (e.g., moves) ACM or PACM ceiling tiles below a plenum that does not contain surfacing or SAI ACM or PACM where the ceiling opening is < 32 square feet.

#### **JPR III-3:** Activities involving the removal of ACM or PACM where the waste generated does not exceed the capacity of a standard asbestos waste bag. These activities involve the:

- a. Spot removal of ACM or PACM wallboard, joint tape, or joint compound
- b. Removal, replacement and disposal of ACM or PACM ceiling tiles below a plenum which does not contain surfacing or SAI ACM or PACM and where the ceiling opening is < 32 square feet.

The materials being removed have been identified as containing (or are presumed to contain) greater than 1% asbestos, constitute a potential source of ACM, and abatement could reasonably be expected to contaminate adjoining areas if proper work practices are not followed. Wet methods are mandatory and the ACM or PACM must be captured close to the removal activity and transferred to a waste bag. If waste exceeds the capacity of a standard asbestos waste bag, then Class II Asbestos work, JPR II-1 or II-2 must be used.

Accomplishing these jobs requires a number of sequential and concurrent steps. The most prominent of these are listed below. Find specific details for performing all required activities by referring to accepted industry practices and procedures based on requirements found in 29 CFR 1926.1101, 29 CFR 1910.1001, and 40 CFR 763, as amended.

1. Ensure supervision by a properly qualified, competent person.
2. The assigned competent person shall verify that training, medical and PPE requirements of the asbestos workers are complete and current.

## Attachment 12D

### Class III Asbestos Work – Regulated Area Defined By Barricade with Floor Covering (cont.)

3. Notify and coordinate job tasks with proper officials (facility manager, work area supervisor, and OHD).
4. Establish regulated area. Place barricades and signs around work area. Barricades must be placed a sufficient distance beyond the work zone to capture all debris from work activities and to ensure that no asbestos concentration exceeds applicable limits.
5. Move employees out of the regulated area.
6. Shut down HVAC system if possible without unduly interrupting facility work force. The HVAC system must be shut down when disturbance of ACM or ACM containing debris could reasonably be expected to migrate to other areas.
7. Don protective equipment and clothing and respiratory protection.
8. Conduct personnel and area sampling as required.
9. Place one layer of 6-mil polyethylene beneath work area. The polyethylene must extend beyond the work zone a sufficient distance to catch/trap any asbestos debris that may fall. If removing ceiling tiles, place polyethylene sheeting at least one ceiling tile beyond the opening in each direction. Move the boundary of the regulated area as necessary to ensure the polyethylene sheeting does not extend beyond the boundary..
10. When removing ceiling tiles:
  - a. Place ladder below first ceiling tile.
  - b. As tile is lifted, HEPA vacuum the tile grid supports.
  - c. Remove one ceiling tile. Lower carefully, maintaining horizontal orientation.
  - d. HEPA vacuum and wet wipe surface facing plenum and exposed side(s).
  - e. Wet wipe and HEPA vacuum tile hanger assembly.
  - f. HEPA vacuum next tile to be removed, remove next tile, and wet wipe and HEPA vacuum tile hanger assembly.
  - g. Repeat for a maximum of three tiles (less than 32 square feet).
  - h. If unable to decontaminate tile, or if ACM or PACM tiles are being removed/disposed, place in asbestos waste disposal bag.
11. If performing spot removals/abatement of SAI, or acoustical decoration, or wallboard, tape, and mud:
  - a. Spray spot and surrounding area with amended water and let it soak into the ACM.
  - b. Cut with sharp knife or other tool so as not to generate asbestos fibers. Use a HEPA vacuum adjacent to the cutting tool to capture asbestos fibers/dust.
  - c. Catch asbestos waste in container held close to removal spot/area.
  - d. Clean substrate, as applicable.

## Attachment 12D

### Class III Asbestos Work – Regulated Area Defined By Barricade with Floor Covering (cont.)

- e. Spray/mist substrate and exposed side(s) of ACM with approved encapsulant.
- 12. If applicable, modify structural components so as not to disturb surrounding ACM.
- 13. If applicable, carefully remove wall partitions or plaster ceiling materials so as to not disturb surrounding ACM. Remove material and dispose of as normal waste or as directed.
- 14. As applicable, perform work in plenum above suspended ceilings.
- 15. When the plenum area is below surfacing or SAI ACM or PACM, wet wipe all cables, wires, conduit, and piping as they are removed from plenum area. HEPA vacuum all other items as they are removed from plenum area.
- 16. HEPA vacuum work area.
- 17. Visually inspect above ceiling and/or around work area, to ensure that there is no remaining visible ACM or PACM dust/debris.
- 18. Replace ceiling tiles, as applicable
- 19. Visually inspect and clean the regulated area and all equipment to ensure there is no visible ACM dust/debris. Follow cleaning and inspection procedures of Chapter 12.12.
- 20. Decontaminate personnel and all equipment by HEPA vacuum.
- 21. HEPA vacuum and wet wipe polyethylene placed beneath work area. If unable to decontaminate, carefully gather plastic and dispose as asbestos-contaminated waste. Follow cleaning and inspection procedures of Chapter 12.
- 22. Conduct final visual clearance inspection. Reclean as necessary.
- 23. Decontaminate disposable coveralls, remove, and dispose of as asbestos-contaminated waste.
- 24. Remove respirator.
- 25. Call Work Control Center to dispose of all ACM and ACM-contaminated materials. Record Work Control Pickup Ticket Number on Asbestos Work Permit. Notify area supervisor that task is complete.
- 26. Remove barricades and signs and disestablish regulated area.
- 27. Notify Facility Manager of job completion.

## Attachment 12E

### Class III Asbestos Work – Regulated Area Defined by an Enclosure

#### *Class III - Asbestos Work – Regulated Area Defined by an Enclosure:*

If at any time during the tasks described below, ACM is noted as delaminating or creating airborne fibers, stop the project and immediately upgrade it to Class I or Class II asbestos work.

**JPR III-4:** Spot removal of surfacing ACM or PACM (e.g., SAI or acoustical or decorative) of less than 3 square feet in contiguous area at a single spot, and the waste generated does not exceed the capacity of one standard asbestos waste bag per individual spot. The materials being removed have been identified as, or are presumed as, containing greater than 1% asbestos, constitute a potential source of ACM, and abatement could reasonably be expected to contaminate adjoining areas if proper work practices are not followed. Wet methods are mandatory and the ACM must be captured close to the removal activity and transferred to a waste bag.

**JPR III-5:** Activities which meet one or more of the following:

- a. Any activity in close proximity (i.e., within 24 inches) of surfacing ACM or PACM.

These jobs may consist of modifying building components (e.g.; steel or concrete structural members; steel or concrete decking) that is in close proximity to SAI for which drilling, hammering, or similar activities could be reasonably expected to disturb the ACM. When it is necessary to drill through or hammer steel that is in proximity to ACM that could be disturbed by the construction or maintenance activity, take precautions to minimize the quantity of asbestos released. Precautions would include evacuating nonessential personnel within the area of the activity, and wetting ACM before work to prevent fiber release.

These jobs may consist of removing and/or replacing wall partitions in close proximity to asbestos materials and could be reasonably expected to disturb the ACM. Airborne asbestos concentrations are expected to be minimal if proper control procedures are followed.

- b. Any entry into a ceiling plenum below surfacing or spray applied insulation/fireproofing (SAI) ACM or PACM where the ceiling opening is greater than or equal to ( $\geq$ ) 32 square feet.
- c. Any activity that disturbs (e.g., moves) ACM or PACM ceiling tiles below a plenum that does not contain surfacing or SAI ACM or PACM where the ceiling opening is  $\geq$  32 square feet.

Accomplishing these jobs requires a number of sequential and concurrent steps. The most prominent of these are listed below. Find specific details for performing all required activities by referring to accepted industry practices and procedures based on requirements found in 29 CFR 1926.1101, 29 CFR 1910.1001, and 40 CFR 763, as amended.

1. Ensure supervision by a properly qualified, competent person.

## Attachment 12E

### Class III Asbestos Work – Regulated Area Defined By An Enclosure (cont.)

2. The assigned competent person shall verify that training, medical and PPE requirements of the asbestos workers are complete and current.
3. Notify and coordinate job tasks with proper officials (Facility Manager, Work Area Supervisor, and OHD).
4. Place barricades and signs around work area.
5. Move employees in the immediate work area out of the regulated area.
6. Shut down HVAC system if possible without unduly interrupting facility work force. The HVAC system must be shut down when disturbance of ACM or ACM containing debris could reasonably be expected to migrate to other areas.
7. Don protective equipment and clothing and respiratory protection.
8. Conduct personnel and area sampling as required.
9. Construct mini-enclosure with polyethylene, incorporate an air-lock or double entrance curtain (“Z” flap). A “pop-up” (e.g., “Kontrol-Kube™”) enclosure will meet this requirement.
10. Pre-clean area as necessary.
11. As necessary, use HEPA vacuum to create a negative pressure inside enclosure.
12. If removing ceiling tiles:
  - a. Place ladder below first ceiling tile.
  - b. As tile is lifted, HEPA vacuum the tile grid supports.
  - c. Remove one ceiling tile. Lower carefully, maintaining horizontal orientation.
  - d. HEPA vacuum and wet wipe surface facing plenum and exposed side(s).
  - e. Wet wipe and HEPA vacuum tile hanger assembly.
  - f. HEPA vacuum next tile to be removed, remove next tile, and wet wipe and HEPA vacuum tile hanger assemble
  - g. Wet wipe and HEPA vacuum tile hanger assembly.
  - h. Repeat as necessary for all tiles to be removed.
  - i. If unable to decontaminate tile, or if ACM or PACM tiles are being removed/disposed , place in asbestos waste disposal bag.
13. If applicable, modify structural components so as not to disturb surrounding ACM.
14. If applicable, carefully remove wall partitions so as to not disturb surrounding ACM. Remove material and dispose of as normal waste or as directed.
15. As applicable, perform work in plenum above suspended ceilings.

## Attachment 12E

### Class III Asbestos Work – Regulated Area Defined By An Enclosure (cont.)

16. When the plenum area is below surfacing or SAI ACM or PACM, wet wipe all cables, wires, conduit, and piping as they are removed from plenum area. HEPA vacuum all other items as they are removed from plenum area.
17. HEPA vacuum work area.
18. Visually inspect above ceiling, around work area, to ensure that there is no remaining visible ACM dust/debris.
19. Replace ceiling tiles.
20. Perform first visual inspection of the regulated area and all equipment below ceiling to ensure there is no visible ACM dust/debris.
21. Decontaminate personnel and all equipment by HEPA vacuum.
22. Clean, inspect, decontaminate enclosure following Chapter 12.12 procedures.
23. Conduct visual clearance inspection. Reclean as necessary.
24. Disassemble enclosure, perform final visual inspection of area, clean as necessary.
25. Decontaminate disposable coveralls, remove, and dispose of as asbestos-contaminated waste.
26. Remove respirator.
27. Call Work Control Center to dispose of all ACM and ACM-contaminated materials. Record Work Control Pickup Ticket Number on Asbestos Work Permit.
28. Remove signs and disestablish regulated area.
29. Notify Facility Manager of job completion.

**JPR III-6:** Removal of plaster and sheetrock ceilings below the ceiling plenum in buildings with ACM or PACM surfacing or spray applied insulation/fireproofing (SAI) .

This job consists of work activities to remove plaster and sheetrock ceilings below the ceiling plenums in buildings with asbestos containing spray applied insulation (SAI). The plaster is most often used with a wire-mesh support. The wire mesh or sheetrock supports may be suspended by wires from the overhead deck. The top side of the plaster or the sheetrock is assumed to be contaminated with asbestos debris. Removal of the plaster or sheetrock will create significant amounts of dust and debris which could contain some asbestos debris. Partial to whole-body entry into the plenum is required for some or all of the plaster/sheetrock ceiling removal. Asbestos concentrations are reasonably expected to be low if proper precautions and procedures are incorporated into job planning. This task does not include the abatement of any ACM SAI, but has the potential to disturb the ACM SAI if precautions are not taken.

Accomplishing these jobs requires a number of sequential and concurrent steps. The most prominent of these are listed below. Find specific details for performing all required activities

## Attachment 12E

### Class III Asbestos Work – Regulated Area Defined By An Enclosure (cont.)

by referring to accepted industry practices and procedures based on requirements found in 29 CFR 1926.1101, 29 CFR 1910.1001, and 40 CFR 763, as amended.

1. Ensure supervision by a properly qualified, competent person.
2. The assigned competent person shall verify that training, medical and PPE requirements of the asbestos workers are complete and current.
3. Notify and coordinate job tasks with proper officials (Facility Manager, Work Area Supervisor, and OHD).
4. Place barricades and signs around work area.
5. Move employees in the immediate work area out of the regulated area.
6. Shut down HVAC system if possible without unduly interrupting facility work force. The HVAC system must be shut down when disturbance of plaster/sheetrock dust and ACM containing debris could reasonably be expected to migrate to other areas.
7. Remove furniture and fixtures. Pre-clean area as necessary. Seal stationary items with polyethylene if they cannot be removed.
8. Construct enclosure with polyethylene sheeting.
  - a. Seal edges of enclosure and cover HVAC system vents to prevent escape of dust and debris.
  - b. Install an air-lock vestibule.
  - c. Install a waste load-out area if needed.
  - d. If ceiling is being removed from an entire room, cover the walls with a single layer of at least 6-mil polyethylene.
  - e. Cover the floor of the enclosure with two layers of at least 6-mil polyethylene.
9. Install negative-pressure air machine (large enclosure) or HEPA vacuum (small enclosure) to create a negative pressure of at least -0.02 inches H<sub>2</sub>O inside enclosure.
10. Arrange for OHD to inspect enclosure before work begins.
11. Don protective equipment and clothing and respiratory protection before entering the enclosure.
12. Conduct personnel and area sampling as required.
13. Remove ceiling:
  - a. Gain entry to ceiling through hatch, if one exists.
  - b. Otherwise, select a location to cut an opening and place ladder/work stand below. Wet the cut-line then cut opening through ceiling. Use a vacuum, HEPA (with a design used for wet application to mitigate shock hazard) to catch/collect dust generated during the cutting process. Carefully lower the cut out piece of ceiling, maintaining horizontal orientation. HEPA vacuum the surface facing plenum.

## Attachment 12E

### Class III Asbestos Work – Regulated Area Defined By An Enclosure (cont.)

- c. HEPA vacuum the top of the next ceiling area to be removed and then cut it out.
    - Minimize generation of plaster/sheetrock dust and debris.
    - Wet top and bottom surfaces to be cut.
    - Catch or collect dust generated by the cutting process with a HEPA vacuum.
    - Avoid, as much as possible, partial cutting and/or tearing down the ceiling since this creates more plaster/sheetrock dust and debris.
  - d. Repeat as necessary for all of ceiling area being removed.
  - e. Control plaster/sheetrock dust inside enclosure with water mist.
14. Double bag and dispose of all plaster and sheetrock waste as asbestos waste. Wet all debris as it is being bagged. Place a JSC Form 1161, "Disposal Inventory for Miscellaneous Hazardous Waste," on each waste bag. See waste disposal procedures/process in Chapter 12.14.
  15. If applicable, modify structural components so as not to disturb surrounding ACM.
  16. Wet wipe all cables, wires, conduit, and piping as they are removed from plenum area. HEPA vacuum all other items as they are removed from plenum area. .
  17. Clean, inspect, decontaminate enclosure following Chapter 12.12 procedures.
  18. Conduct visual inspection of the enclosure and all equipment below the ceiling plane. Reclean as necessary.
  19. Arrange for OHD to conduct a visual clearance inspection.
  20. Install new ceiling and perform other construction work.
    - a. As long as the ceiling remains open to the ACM SAI then all work will be conducted using Class III Asbestos Work procedures as described in JPRs III-4 or III-5.
    - b. Removal/Abatement of any surfacing, SAI, or TSI ACM or PACM SAI will be conducted using JPRs I-1 through I-4, as appropriate. If the abatement activities involve amounts equal to or greater than ( $\geq$ ) 260 linear feet, 160 square feet, or 35 cubic feet of ACM or PACM, then submit an asbestos project design and provide the JSC Environmental Office, at least 15 working days prior to beginning work, all information required to make notification to the TDSHS.
  21. After new ceiling is completely installed, conduct visual inspection and clean/reclean as necessary.
  22. Arrange for OHD to perform a final visual clearance visual inspection and clearance air sampling.
  23. Disassemble the enclosure and perform final visual inspection of area, clean as necessary.
  24. Decontaminate equipment by HEPA vacuuming and wet wiping.
  25. Decontaminate personnel and disposable coveralls, remove, and dispose of as asbestos-contaminated waste.

## **Attachment 12E**

### **Class III Asbestos Work – Regulated Area Defined By An Enclosure (cont.)**

26. Remove respirator.
27. Call Work Control Center to dispose of all ACM and ACM-contaminated materials. Record Work Control Pickup Ticket Number on Asbestos Work Permit and on the JSC Forms 1161.
28. Remove signs and disestablish regulated area.
29. Notify Facility Manager of job completion.
  
- 30.

## Attachment 12F

### Class III Asbestos Work – Other

**Class III Asbestos Work – Other:** Other Class III asbestos-related work where the activities cannot be easily grouped into a specific type of regulated area. The Asbestos Competent Person for the activity will determine the extent and construction of the regulated area.

**JPR III-7:** Repair or maintenance of equipment with ACM or PACM to include: (i) equipment that has ACM or PACM insulation, or (ii) replacement and removal of ACM or PACM gaskets. These activities involve:

- a. The repair and maintenance of equipment (motors, engines, relays, ovens, file cabinets, etc.) that has ACM or PACM inside the unit. It does not cover equipment with ACM insulation on the outside, which must be removed before gaining access to the interior of the unit. Airborne concentrations of asbestos fibers are reasonably expected to be less than 0.1 f/cc. If equipment is known to contain asbestos and there is no intention of servicing the equipment or removing the asbestos, the equipment must be disposed of as asbestos waste through the FSS contractor (i.e., it cannot be disposed of or declared excess through the JSC Logistics Division).
- b. Removing ACM or PACM gasket materials from valves and pipe flanges. This job does not include removing ACM or PACM from the outside of the valve or pipe joint. (Removing ACM from outside of the valves and pipe joints will be conducted under Class I asbestos work, JPRs I-2 and I-4, or Class III asbestos glovebag work, JPR III-1, as appropriate). Airborne concentrations of asbestos fibers are reasonably expected to be less than 0.1 f/cc if proper controls are followed.

This job requires a number of sequential and concurrent steps. The most prominent of these are listed below. Find specific details for performing all required activities by referring to accepted industry practices and procedures based on requirements found in 29 CFR 1926.1101, 29 CFR 1910.1001, and 40 CFR 763, as amended.

1. Ensure supervision by a properly qualified, competent person.
2. The assigned competent person shall verify that training, medical, and PPE requirements of the asbestos workers are complete and current.
3. Notify proper offices
4. Establish regulated area
5. Place barricades and signs around work area
6. Place one layer of 6-mil polyethylene under (around, if equipment is floor mounted) equipment to be repaired.
7. Don protective clothing and respirator.
  - a. As appropriate, disassemble valve or pipe flange. HEPA-vacuum/wet-wipe valve-gasket interfaces.
  - b. Scrape off and collect ACM gasket materials using wet methods.

## Attachment 12F

### Class III Asbestos Work – Other (cont.)

- c. Bag ACM.
  - d. HEPA-vacuum/wet-wipe flange surfaces.
  - e. Install new gasket.
  - f. Reassemble valve piping.
  - g. HEPA-vacuum/wet-wipe outside of valve and surrounding area.
8. As appropriate, open equipment
- a. HEPA vacuum interior.
  - b. Wet ACM material.
  - c. Remove ACM (if necessary) and place in ACM waste bag, if being discarded. Replace with non-ACM if feasible.
  - d. Repair equipment.
  - e. HEPA vacuum interior.
  - f. Close up equipment.
9. HEPA-vacuum polyethylene and visually inspect regulated area.
10. Clean and inspect work area following procedures in Chapter 12.12 .
11. Place all rags, materials, polyethylene, and vacuum cleaner bags into ACM waste bags.
12. HEPA-vacuum disposable work clothes. Remove protective clothing and dispose of as asbestos-contaminated waste.
13. Remove, clean, and store respirator.
14. Call Work Control Center to dispose of asbestos-contaminated waste. Record Work Control Pickup Ticket Number on Asbestos Work Permit.
15. Notify supervisor that task is complete.
16. Remove barricades and signs and disestablish regulated area.

#### **JPR III-8:** Maintenance of equipment used in asbestos abatement or decontamination work.

This task includes replacing filters and maintaining equipment used in ACM abatement and decontamination operations. This would generally include negative-pressure air filtration, water filters, and HEPA-equipped vacuum cleaners. These filters would generally be expected to contain significant quantities of ACM; consequently, these units may need to be serviced within a small enclosure. When not in service, secure HEPA vacuum cleaners and negative-pressure, air-filtration equipment with plastic on each inlet and exhaust opening to the unit.

Accomplishing these jobs requires a number of sequential and concurrent steps. The most prominent of these are listed below. Specific details for performing all required activities may

## Attachment 12F

### Class III Asbestos Work – Other (cont.)

be found by referring to accepted industry practices and procedures based on requirements found in 29 CFR 1926.1101, 29 CFR 1910.1001, and 40 CFR 763, as amended.

1. Ensure supervision by a properly qualified, competent person
2. The assigned competent person shall verify that training, medical, and PPE requirements of the asbestos workers are complete and current.
3. Coordinate job tasks with proper officials.
4. Secure HVAC and electrical systems, as necessary. Ensure equipment is de-energized. Perform LO/TO procedures as appropriate.
5. Move employees in the immediate work area out of the controlled area.
6. Place barricades and signs around work area. Build enclosure as needed. Place polyethylene sheeting on work surface.
7. Don protective clothing and respirator.
8. Open filter unit.
9. HEPA-vacuum/wet-wipe filter unit covers and duct.
10. Spray filter with mist of water or a tack coating.
11. Ensure complete filter surface is covered.
12. Place filter into plastic bag, seal bag, and label as asbestos waste.
13. HEPA-vacuum/wet-wipe filter installation area.
14. Install new filter.
15. Close unit.
16. Clean and inspect work area following procedures in Chapter 12.12.
17. HEPA-vacuum work area including plastic sheeting placed beneath work area.
18. Disassemble enclosure.
19. Collect decontaminated plastic sheeting placed beneath work area, place in waste bags, and dispose of as normal refuse.
20. Conduct visual clearance inspection.
21. HEPA-vacuum work area and protective clothing. Remove protective clothing and dispose of as asbestos-contaminated waste.
22. Remove, clean, and store respirator.
23. Call Work Control Center to dispose of asbestos-contaminated waste. Record Work Control Pickup Ticket Number on Asbestos Work Permit.
24. Notify area supervisor that task is complete.
25. Remove barricades and signs.

## Attachment 12F

### Class III Asbestos Work – Other (cont.)

**JPR III-9:** Removal of (i) ACM vinyl/asphalt floor tile; (ii) non-ACM floor tile with ACM mastic; or (iii) carpet tiles with ACM mastic using procedures and methods specified by the RFCI. Waste is limited to one standard waste bag.

Tiles must be removed **intact**. Removal procedures must not use spud bars or mechanical chippers. If these conditions are not or cannot be met, removal must be conducted under JPR II-1.

The RFCI document “Recommended Work Practices for Removal of resilient Floor Coverings” may be found at <http://www.rfci.com/index.php>. See the TDSHS statement concerning RFCI procedures at: <http://www.dshs.state.tx.us/asbestos/pdf/ARC022.pdf>. RFCI procedures prohibit sanding, sawing, drilling, grinding, abrasive blasting, bead blasting, dry sweeping, dry scraping, and mechanical chipping or pulverizing of resilient flooring, lining, backing felt, and adhesive materials.

To accomplish this task, a number of sequential and concurrent steps are required. The most prominent of these are listed below. Workers will wear protective clothing and respiratory protection. Find specific details for performing all required activities by referring to the accepted RFCI industry practices and procedures.

1. Ensure supervision by a properly qualified, competent person
2. The assigned competent person must verify training, medical, and PPE requirements of the asbestos workers are complete and current.
3. Notify proper offices.
4. Ensure supervision by a properly qualified competent person.
5. Establish regulated area, post warning signs, and rope off area with barricade tape.
6. ***Pre-clean work area.***
7. Prepare amended water/detergent solution using RFCI directions.
8. Don protective clothing and respiratory protection.
9. Remove floor tiles using RFCI methods:
  - a. Wet floor tile with water/detergent solution.
  - b. Using one of the RFCI methods, carefully remove floor tiles one at a time, keeping them intact. The RFCI methods are:
    - Wet floor tile with water/detergent solution; work a short- or long-handled scraper beneath a floor tile to exert pressure in a twisting action

## Attachment 12F

### Class III Asbestos Work – Other (cont.)

- Thoroughly heat tile with a hot air gun or radiant heat source to soften tile and adhesive, then remove by hand or with scraper
  - Place removed tiles into ACM waste bags with water/detergent solution
10. Remove carpet tiles that have adhered to floor with ACM mastic. Pry or peel up carpet tiles, keep mastic wet with water/detergent solution. Place contaminated carpet tiles into ACM waste bags with water/detergent solution.
  11. Remove residual ACM mastic using RFCI wet-scraping methods and/or adhesive solvents and place into ACM waste bags. RFCI methods allow use of adhesive solvents with a slow-speed (i.e., less than 300 rpm) floor machine and a 3M black floor pad.
  12. Prepare bagged ACM for disposal.
  13. Visually inspect and clean the regulated area and all equipment to ensure that there is no visible ACM dust/debris. Follow cleaning and inspection procedures in Chapter 12.12.
  14. Decontaminate personnel and all equipment by HEPA vacuum.
  15. Conduct final visual clearance inspection. Re-clean as necessary.
  16. Decontaminate, remove, and dispose of disposable coveralls as asbestos-contaminated waste.
  17. Remove respirator.
  18. Call Work Control Center to dispose of all ACM and ACM-contaminated materials. Record Work Control Pickup Ticket Number on Asbestos Work Permit. Notify area supervisor that task is complete.
  19. Remove barricades and signs and disestablish regulated area.
  20. Notify facility manager of job completion.

**JPR III-13:** Activities required to be performed under raised computer floor and sub-floor areas (i.e., system inspections, system repairs, system installations, cable installations or removals, and sub-floor cleaning) in buildings with SAI/fireproofing or exposed acoustical decoration.

- a. This job consists of removing and/or replacing raised computer floor tiles for activities to be performed in sub-floor areas where the potential for asbestos dust exists. If proper control measures are followed, airborne asbestos concentrations are expected to be minimal.
- b. Requirements of this JPR do not apply if activities do not require physical entry into sub-floor areas (physical entry is defined as happening when any part of a human body (arm, foot, head) breaks the plane of the flooring). For example, inspections of sub-floor areas from above the floor surface are not regulated under either this JPR or Part 12.

Accomplishing this job requires a number of sequential and concurrent steps, regardless of the number of tiles to be removed. The most prominent of these are listed below. Find specific

## Attachment 12F

### Class III Asbestos Work – Other (cont.)

details for performing all required activities by referring to accepted industry practices and procedures based on requirements found in 29 CFR 1926.1101, 29 CFR 1910.1001, and 40 CFR 763, as amended.

2. A competent person must verify that training, medical, and PPE requirements are complete and current.
3. Notify and coordinate job tasks with proper officials.
4. When feasible, shut down under-floor HVAC systems in the area. Perform operation/energy control procedures as needed (see Chapter 8.2 of this handbook).
5. Don protective clothing and respirator.
6. Remove floor tile panel and HEPA vacuum underside of panel.
7. Wet-wipe and/or HEPA-vacuum floor tile support assembly.
8. HEPA-vacuum the under-floor area where work is to be performed.
9. If activity is for removal of any under-floor equipment or cabling, HEPA-vacuum and/or wet-wipe all items as they are removed from the floor cavity.
10. Replace tiles as necessary.
11. Conduct visual clearance inspection.
12. HEPA-vacuum work area and protective clothing. Remove protective clothing and dispose of as asbestos-contaminated waste.
13. Remove, clean, and store respirator.
14. Call Work Control Center to dispose of asbestos-contaminated waste. Record Work Control Pickup Ticket Number on the Asbestos Work Permit.
15. Notify area supervisor that task is complete.

## Attachment 12G

### Class IV Asbestos Work

#### ***Class IV Asbestos Work:***

The permit requirements, established in Chapter 12.1, are categorically waived for activities falling within this attachment. Notifications as required in Chapter 12.6 are waived unless debris is spotted and an Emergency Cleanup is initiated.

**JPR IV-1:** Changing air filters in comfort cooling or clean room systems in buildings with SAI/fireproofing.

- a. Air-conditioning systems contain filters that must be routinely replaced. Comfort units usually have a 1- to 2-inch-thick polyethylene pad media. Some units have roll media that is advanced automatically based upon pressure differential. Units serving computers and electronics usually have a polyethylene-pad pre-filter and a 65% efficiency secondary filter. Clean room units usually have a pre-filter, a 65 % efficiency secondary, and an HEPA final filter. All pre-filters are changed on a periodic schedule established in the FSS contractor's preventive maintenance procedure. Secondary and HEPA filter are changed at established pressure differential points.
- b. If units are above ceilings in a building with SAI, perform this activity using the appropriate Class III asbestos procedures from Appendix 12B, Attachments 12D and 12E.

Accomplishing these jobs requires a number of sequential and concurrent steps. The most prominent of these are listed below. Find specific details for performing all required activities by referring to accepted industry practices and procedures based on requirements found in 29 CFR 1926.1101, 29 CFR 1910.1001, and 40 CFR 763, as amended.

1. A competent person is to verify that training, medical and PPE requirements are complete and current.
2. Coordinate job tasks with proper officials.
3. Secure HVAC and electrical systems. Perform operation/energy control procedures as needed (see Chapter 8.2 of this handbook).
4. Open air-handling unit filter bank/holder(s).
5. HEPA-vacuum/wet-wipe filter unit covers.
6. Wet-mist/spray filters as they are removed from the filter holders.
7. Place filters from building air-conditioning systems or similar applications in plastic bags and seal; you can dispose of them as normal refuse, since they would not be expected to contain ACM.
8. HEPA-vacuum/wet-wipe filter installation area and duct.
9. Install new filter and close unit.
10. HEPA-vacuum work area outside air-handling unit.
11. Reestablish air-conditioning unit operation.

**Attachment 12G**  
**Class IV Asbestos Work (cont.)**

**JPR IV-4:** Emergency response action to an asbestos fiber release.

- a. This job consists of the cleanup and/or decontamination of an area that has been subjected to an incidental minor or major fiber release of either a known ACM or a material that is reasonably expected to contain more than 1% asbestos. Immediate control measures can prevent further contamination of surrounding areas or adjoining facilities.
- b. Responding FSS Environmental Support and OHD personnel will determine control measures to be established. OHD will determine the need to perform clearance air sampling.
- c. FSS contractor personnel responding to a fiber release will not proceed with the cleanup until they ensure that OHD has been notified.
- d. The competent person for the cleanup will determine whether the cleanup will be conducted under Class I, II, III, or IV asbestos work procedures.
- e. If spills are small and FSS contractor personnel establish the regulated area, the FSS personnel will disestablish the area after final cleanup and inspection and will be responsible for removing barrier tape/warning signs. If OHD establishes the regulated area or decides that clearance air sampling is required, OHD will disestablish the area after final cleanup and inspection and will be responsible for removing barrier tape/warning signs.
- f. Communication with all parties in the affected area is very important. Therefore, the organization responsible for establishing the regulated area will ensure that the facility manager and work area supervisor have been informed about the response activity, the cleanup process and clearance air sampling to be performed (if required), and the approximate duration of the cleanup. This notification may be verbal but must occur before the start of the cleanup. The facility manager and work area supervisor should be asked to inform the occupants of the affected area. Additionally, occupants/employees in nearby areas should be informed about the cleanup activity and the expected duration.
- g. The organization responsible for establishing the regulated area and removing the barrier tape and warning signs will provide courtesy notification to the EOC Security Dispatcher at nonemergency x34658 at the start and completion of the cleanup. Additional notification to JSC management will be made at the discretion of the responders.
- h. The organization responsible for removing the barrier tape and warning signs will also be responsible for notifying the facility manager and work area supervisor that the area is clean and operations may return to normal. These notifications must be made in writing within 2 hours of the cleanup completion; e-mail notification is acceptable.

Emergency response cleanup requires a number of sequential and concurrent steps. The most prominent of these are listed below. Find specific details for performing all required activities

## Attachment 12G

### Class IV Asbestos Work (cont.)

by referring to accepted industry practices and procedures based on requirements found in 29 CFR 1926.1101, 29 CFR 1910.1001, and 40 CFR 763, as amended.

1. Ensure supervision by a properly qualified, competent person.
2. Evacuate personnel and establish regulated area.
3. Notify FSS Environmental Support Contractor and OHD (SD3229) of the contamination. Provide courtesy notification to EOC Security Dispatcher at nonemergency x34658.
4. Responding FSS Environmental Support and OHD personnel will determine control measures to be established and will establish the requirements for OHD clearance air sampling.
5. The FSS competent person will determine whether the cleanup will be conducted as OSHA Class I, II, III, or IV asbestos-related work.
6. The assigned competent person shall verify that training, medical, and PPE requirements of the asbestos workers are complete and current.
7. Establish the regulated area. Place barricades and signs around the area.
8. Build small or large enclosure as needed/as appropriate; seal all entrances and exits with 6-mil polyethylene, construct airlock or “Z-flap” entrance, and install negative pressure on containment, if needed.
9. Shut down and isolate HVAC system. Perform operation/energy control procedures as needed (see Chapter 8.2 of this handbook).
10. Secure electrical and fire alarm systems. Perform operation/energy control procedures as needed (see Chapter 8.2 of this handbook). If necessary, disable fire alarm system by coordinating with the Fire Protection Coordination Office.
11. Don protective equipment and clothing and respiratory protection.
12. Conduct personnel and area sampling as directed by the OHD.
13. Apply the appropriate JPR to abate or repair ACM fiber release source, as needed.
14. HEPA-vacuum and wet-wipe contaminated area(s) and contaminated furnishings.
15. Bag contaminated items that cannot be decontaminated.
16. Perform gross and final cleaning as appropriate (see procedures in Chapter 12.12).
17. Visually inspect and re-clean as required (see procedures in Chapter 12.12).
18. Contact OHD as required for clearance visual inspection. Re-clean as required.
19. Decontaminate personnel and equipment with HEPA vacuum, and package contaminated materials—i.e., suits, cartridges, rags, etc.—for disposal.
20. Prepare bagged ACM for disposal.
21. Remove bagged ACM from the area.

## **Attachment 12G**

### **Class IV Asbestos Work (cont.)**

22. Contact OHD to conduct clearance air sampling, as required.
23. FSS or OHD personnel will disestablish regulated area and remove barrier tape and warning signs, as agreed upon (see statements above).
24. COSS or OHD personnel, as agreed upon (see statements above), will provide written notification within 2 hours to the facility manager and the work area supervisor of task completion and return of area to normal operations. Provide courtesy notification to EOC security dispatcher that cleanup is complete.

## **Attachment 12H**

### **Custodial Work**

**C-1:** Custodial work in rooms/areas with exposed or encapsulated sprayed-applied asbestos insulation or acoustical decoration. Some administrative work areas, conference/meeting rooms, and building lobbies have exposed ACM materials. While this ACM is not normally expected to delaminate or cause airborne asbestos fibers, take precautions to ensure that custodial staff cleaning these areas are protected and do not cause any debris to become airborne. All of these areas are posted with notifications about the hazard. The custodial staff must follow the following steps/procedures:

1. Verify that asbestos awareness training requirements are complete and current.
2. Do not poke at, dust, or disturb the exposed SAI or acoustical material.
3. Use a properly maintained HEPA vacuum, with attachments, to clean floors and furniture. Do not, REPEAT DO NOT, use a regular vacuum in these areas.
4. For Building 2S, use a dedicated vacuum cleaner, change the vacuum bag using specified procedures, and dispose of the bag as asbestos contaminated waste.
5. If you spot any asbestos debris, actual or suspected, in these areas, have the facility manager contact the FSS Contractor and/or OHD for an inspection and cleanup.

**C-2:** Custodial work involving asbestos-containing flooring (sheeting or floor tiles). Some buildings at JSC have floor tile or sheeting that contains asbestos. While this material is normally non-friable, take care to avoid disturbing the surface of the material in a manner that would generate asbestos fibers and cause exposures to custodial staff. If you are custodial staff, follow the following steps/procedures:

1. Verify that asbestos awareness training requirements are complete.
2. Do not sand, abrade, or grind on floor material.
3. When stripping old wax off the floor, use a wetted stripping agent to prevent dry rubbing of the floor surface, and use a machine that rotates with a speed of less than 300 rpm. (Reference OSHA 29 CFR 1910.1001(j) and 1910.1001(k))
4. Ensure there is a heavy coat of wax on the floor before polishing with a polishing machine. When polishing the flooring with a polishing machine, spray the floor with a water mist to prevent dry rubbing of the floor surface. It is desirable to use a machine that turns with a speed of less than 300 rpm.
5. If you spot any asbestos debris, actual or suspected, in these areas, have the facility manager contact the FSS Contractor and/or the OHD for an inspection and cleanup.

## **Attachment 12J**

### **Asbestos Glossary**

The following terms and definitions apply to Part 12.

**Abatement** – Procedures to control fiber release from any materials containing more than 1% asbestos such as surfacing materials, thermal insulating materials, and building and miscellaneous materials (roofing, siding, flooring, ceiling tiles, etc). It includes encapsulation, permanent enclosure, or removal of ACM during renovations and demolitions of facilities containing ACM.

**ACM** – Asbestos-containing material. Any material containing more than 1% asbestos by weight.

**ACBM** – Asbestos-containing building material. ACBM is surfacing ACM, TSI ACM, or miscellaneous ACM that is found in or on interior structural members or other parts of a building. A term used by the EPA. (40 CFR 763)

**ACGIH** – American Conference of Governmental Industrial Hygienists.

**AIHA** – American Industrial Hygiene Association.

**AIHA** – Accredited Laboratory. A certification given by the AIHA to an analytical laboratory that has been examined for quality control and proficiency and meets AIHA standards of performance and operation.

**Airborne** – Pertaining to materials that have been dispersed and are suspended or slowly falling in the air.

**Airlock** – An opening through an installed barrier system, usually consisting of two polyethylene curtained doorways at least 3 ft apart, at an asbestos abatement activity that allows ingress and egress of workers and materials and restricts the movement of airborne material from the contaminated area to the clean area.

**Air Sampling/Air Monitoring** – The process of measuring the fiber content/concentration of a specific volume of air in a stated time.

**Amended Water** – Water to which a chemical wetting agent (surfactant) has been added to improve penetration into asbestos-containing material.

**APM** – Asbestos Program Manager. The individual responsible for managing all aspects of the Asbestos Control Program. At JSC this individual is the Environmental Officer (JE).

**Approved Respirator** – Respiratory protection equipment tested and listed as satisfactory according to standards established by either NIOSH or the Mine Safety and Health Administration to provide respiratory protection.

**Asbestos** – The generic name for a variety of naturally occurring hydrated mineral silicates that possess a unique crystalline structure, are incombustible in air, and are separable into fibers. Six

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### Asbestos Glossary (cont.)

asbestos species were used commercially in large amounts: chrysotile, amosite, crocidolite, anthophyllite, tremolite, and actinolite. For purposes of Part 12, “asbestos” includes PACM, as defined below.

**Asbestos-Containing Materials (ACM)** – A material containing more than 1% of any type or mixture of types of asbestos.

**Asbestos-Containing Building Material (ACBM)** – ACBM is surfacing ACM, TSI ACM, or miscellaneous ACM that is found in or on interior structural members or other parts of a building. A term used by the EPA. (40 CFR 763)

**Asbestos Fibers** – Fibers longer than 5 microns (length-to-width ratio of 3:1) generated from an ACM.

**Asbestos Program Manager** – The individual responsible for managing all aspects of the Asbestos Control Program. At JSC this individual is the Environmental Officer (JE).

**Asbestos Removal** – The physical removal of ACM or PACM from an area.

**Asbestos Worker** – A JSC civil servant or resident support contractor employee who is routinely engaged in asbestos-related activities.

**ANSI** – American National Standards Institute.

**ASTM** – American Society for Testing and Standards.

**Barrier** – Any surface, warning tape, or sign that separates the asbestos-regulated area to inhibit the movement of fibers or unauthorized personnel.

**Browncoat** – A layer of plaster-like material, usually brown, covering the plaster ceiling to which the ACM coating is applied.

**Certified Industrial Hygienist** – A person having a college or university degree in industrial hygiene, chemistry, engineering, physics, or medicine or related biological sciences who, by virtue of special studies or training, has acquired competence in the practice of industrial hygiene *and* who has successfully completed examinations administered by the American Board of Industrial Hygiene, which certifies individuals in either the Comprehensive Practice of Industrial Hygiene or in an Industrial Hygiene Aspect (e.g.; chemistry, indoor environmental quality, etc.).

**CFR** – Code of Federal Regulations.

**Class I Asbestos Work** – Activities involving the removal of TSI, surfacing ACM, and presumed ACM (PACM). (29 CFR 1926.1101)

**Class II Asbestos Work** – Activities involving the removal of ACM that is not TSI or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor

## Attachment 12J

### Asbestos Glossary (cont.)

tile and sheeting, asbestos concrete or asbestos cement items, transite, roofing and siding shingles, and construction mastics. (29 CFR 1926.1101)

**Class III Asbestos Work** – Means repair and maintenance operations where ACM, including TSI and surfacing ACM and PACM, is likely to be disturbed. (29 CFR 1926.1101)

**Class IV Asbestos Work** – Maintenance and custodial activities during which employees contact but do not disturb ACM or PACM and activities involving the cleanup of dust, waste, and debris from Class I, II, and III activities. (29 CFR 1926.1101)

**Clean Area** – See Clean Room.

**Clean Change Room** – See Clean Room.

**Clean Room** – A clean room is an uncontaminated room/area having facilities for the storage of asbestos workers' street clothing and uncontaminated materials and equipment. The clean room must be equipped with a locker or appropriate storage container for each employee's use. Following showering, employees change into street clothing in the clean room area.

**Clearance** – Before release of an area upon completion of asbestos-related activities, visual inspections and/or clearance air sampling will be performed to ensure that no residual asbestos debris or airborne asbestos fibers remain.

**Clearance Air Sampling/Air Monitoring** – Air sampling, performed to verify that the airborne fiber concentration is less than 0.01 f/cc, done before releasing a regulated asbestos removal area.

**Competent Person** – A person who meets the requirements in Chapter 12.7 of this handbook and is designated as such by the employer.

**Controlled Area** – A term used within Part 12 to define an area that is not considered a regulated area under OSHA, but is subject to certain control procedures prescribed within Part 12 to minimize the potential asbestos exposure of employees, workers, and building occupants.

**Custom Containment Bag** – See Glovebag.

**Decontamination** – The process of removing contaminants that have accumulated on personnel and equipment to prevent exposure of the people or contamination of otherwise uncontaminated people, areas, or equipment.

**Decontamination Area** – A decontamination area is an enclosed area adjacent and connected to the regulated area consisting of an equipment room, a shower area, and a clean room, used to decontaminate workers, materials, and equipment that are contaminated with asbestos. The enclosure for this area is typically constructed of plastic, with curtained doorways between adjacent rooms; however, it may be a portable, prefabricated unit.

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### Asbestos Glossary (cont.)

**Demolition** – The wrecking or removing of any component, system, finish, or assembly of a facility together with any related handling operations.

**Disturb/Disturbance** – An activity that disrupts the matrix of ACM or PACM, crumbles or pulverizes ACM or PACM, or generates visible debris from ACM or PACM. A disturbance includes cutting away small amounts of ACM and PACM no greater than the amount that can be contained in one standard-sized glovebag or waste bag to access a building component. (29 CFR 1926.1101)

**Employee** – A JSC civil servant or a support contractor.

**Encapsulant** – A liquid material that can be applied to ACM that controls the possible release of asbestos fibers from the material either by creating a membrane over the surface (a bridging encapsulant) or by penetrating the material and binding its components together (a penetrating encapsulant).

**Encapsulation** – The treatment of ACM with a material that surrounds or embeds asbestos fibers in an adhesive matrix to prevent the release of fibers; a bridging encapsulant or a penetrating encapsulant.

**Enclosure (1)** – As used in Part 12 and by OSHA, means the construction of an airtight, impermeable, temporary barrier around a regulated area to control the release of asbestos fibers into the air where they could migrate into an adjacent area.

**Enclosure (2)** – As used by the EPA for response actions, means the construction of an airtight, impermeable, permanent barrier around ACM and ACBM to control the release of asbestos fibers into the air.

**Environmental Office (JE)** – The office at JSC that is responsible for ensuring compliance with federal, state, and local environmental regulations.

**Equipment Room** – 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.

**EPA** – Environmental Protection Agency.

**f/cc** – the concentration of airborne fibers expressed as the total number of fibers per cubic centimeter of air.

**Fiber Count** – A total number of fibers, of specified diameter and length, obtained by microscopic examination of a filter through which air has been drawn.

**Fit Test** – A test that usually exposes a person wearing a respiratory protection device to a gaseous or aerosol test mixture in a test environment to determine the fit or integrity of the facepiece-to-face seal of the respirator. The test may be qualitative, where the person tested

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### Asbestos Glossary (cont.)

determines by smell or taste whether the mask is leaking, or it may be quantitative, where the concentration of the test mixture inside and outside the mask is determined by instrumentation.

**Friable** – A material that crumbles, pulverizes, or reduces to powder from hand pressure.

**Glovebag** – A sack, typically constructed of 6-mil transparent polyethylene or polyvinyl chloride plastic, with two inward-projecting long sleeve gloves, that is designed to enclose an object from which an ACM is to be removed.

**Grade D Air** – Breathing air that contains 19.5 to 23.5% oxygen (the balance is predominantly nitrogen), no more than 5 milligrams per cubic meter ( $\text{mg}/\text{M}^3$ ) of condensed oil, no more than 10 ppm of carbon monoxide, no pronounced odor, and a maximum of 1000 ppm carbon dioxide. The Compressed Gas Association, Specification G-7.1, is the consensus standard for Grade D breathing air criteria.

**HEPA Filter** – A filter that is capable of trapping and retaining 99.97% of particulates greater than 0.3 micron in size.

**HEPA Filtered Vacuum** – A vacuum cleaner with an HEPA filter that is capable of trapping and retaining 99.97% of all particulates larger than 0.3 microns.

**Holding Area** - Airlock between the shower room and the clean room in a worker decontamination system.

**HVAC** – Heating, ventilation, and air conditioning; generally denoting the air-handling unit and ductwork system found in buildings.

**Hygiene Facility** – The incorporation into an asbestos-removal enclosure of clean rooms, equipment rooms, shower rooms, and decontamination rooms.

**Lagging** – Strips of insulating materials with which boilers, cylinders, or pipes are covered. Sometimes it also refers to insulating mud and final overlays (cloth or metal).

**Large Enclosure** – An enclosure providing an airtight, impermeable barrier around a job involving the removal of more than 260 lf, 160  $\text{ft}^2$ , or 35  $\text{ft}^3$  of ACM. Large enclosures will most likely incorporate airlocks, negative air-filtering systems, hygiene facilities, contaminated equipment rooms, and waste load out rooms.

**LO/TO** – Lockout/tagout.

**Lockout/Tagout** – The process of ensuring that an item of equipment is secured, isolated, or shut down and to prevent its being energized. If such equipment were energized, it would present a safety hazard to workers. Each worker affected by the equipment will place his/her own lock and tag on the equipment when entering an area affected by, or when starting maintenance on, the equipment. Building systems most often affected by LO/TO procedures at JSC are water distribution, electrical, HVAC, and fire alarm systems.

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### Asbestos Glossary (cont.)

**Major Fiber Release** – The falling or dislodging of more than 3 ft<sup>2</sup> or 3 lf of friable ACM/ACBM. (40 CFR 763.91(f))

**Medical Examination** – An evaluation of a person's health status conducted by a medical doctor.

**Medical History** – A person's past health record, including all of the hazardous materials to which he or she has been exposed and any injuries or illnesses that might dictate future health status or work abilities.

**Method 7400** – This is an NIOSH sampling and analytical method for evaluating airborne fiber concentrations using phase-contrast microscopy.

**Method 7402** – This is an NIOSH sampling and analytical method for evaluating airborne fiber concentrations using transmission electron microscopy. Asbestos fibers are counted using the same fiber definitions as Method 7400.

**Micron** – A measurement of length equal to one millionth of a meter.

**Mine Safety and Health Administration** – The counterpart of OSHA for the mining industry.

**Minor Fiber Release** – The falling or dislodging of 3 ft<sup>2</sup> or 3 lf or less of friable ACM/ACBM. (40 CFR 763.91(f)).

**NESHAP** – National Emission Standards for Hazardous Air Pollutants under the Clean Air Act, EPA Regulation 40 CFR Part 61, as amended. The standard for asbestos emissions is found at 40 CFR 61, Subpart M, National Emission Standard for Asbestos, Sections 140-157 (40 CFR 61.140-157).

**NIOSH** – National Institute for Occupational Safety and Health, a division of the Centers for Disease Control and Prevention, U.S. Public Health Service, Department of Health and Human Services.

**Negative Air Filtration Unit** – A piece of equipment consisting of an air mover, usually electrically powered, and an HEPA filter. The unit maintains a negative pressure inside the regulated work area, a constant airflow from adjacent areas into the regulated work area, and exhausts that air to the outside.

**Negative Pressure Respirator** – A respirator in which the air pressure inside the respirator-inlet covering is positive during exhalation (in relation to the air pressure of the outside atmosphere) and negative during inhalation (in relation to the air pressure of the outside air).

**Negative Pressure System** – A local exhaust system that is capable of maintaining a constant, low-velocity air flow into the decontamination enclosure systems and work area from adjacent unsealed areas.

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### Asbestos Glossary (cont.)

**OSHA** – The Occupational Safety and Health Administration, a division of the U.S. Department of Labor established by the Occupational Safety and Health Act (OSH Act) of 1970. Regulations promulgated by OSHA govern occupational safety and health issues affecting the working population in the general industry, the construction industry, and other industrial classifications.

**PACM** – Presumed asbestos-containing material. PACM most often is TSI and surfacing material found in buildings constructed no later than 1980.

**PAT Program** – Proficiency Analytical Testing Program, conducted by the AIHA. A program that, through the submission of unknown standardized samples (including asbestos samples) to analytical laboratories, determines the proficiency of the laboratory in conducting analytical tests.

**PEL** – Permissible exposure limit, as established by OSHA. The PEL for asbestos exposures is 0.1 f/cc, expressed as an 8-hour TWA concentration, as stated in 29 CFR 1910.1001 and 29 CFR 1926.1101.

**Permissible Exposure Limit** – As established by OSHA. The PEL for asbestos exposures is 0.1 f/cc, expressed as an 8-hour TWA concentration, as stated in 29 CFR 1910.1001 and 29 CFR 1926.1101.

**Personal Air Sampling/Air Monitoring** – The sampling of the asbestos fiber concentration within the breathing zone of a worker in an asbestos work area.

**Personal Protective Equipment** – PPE.

**Phase Contrast Microscopy** – A technique that uses a light microscope adapted with phase contrast optical elements to provide enhanced contrast between the fibers and the background, to count fibers on filters through which a volume of air has been pulled. The technique does not distinguish fiber types. This is the standard technique recognized by OSHA.

**PPE** – Personal protective equipment.

**Presumed Asbestos-Containing Material (PACM)** – Material presumed to be ACM. PACM most often is TSI and surfacing material found in buildings constructed no later than 1980.

**Protection Factor** – The ratio of the ambient concentration of an airborne substance to the concentration of the substance inside the respirator at the breathing zone of the wearer. The protection factor is a measure of protection provided by a respirator to the wearer.

**Plenum** – An air compartment connected to one or more ducts as part of an air distribution system. In many buildings, the space between the building structure and a false ceiling is used as a return air plenum in the building HVAC system.

**RFCI** – Resilient Floor Covering Institute (see below).

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### Asbestos Glossary (cont.)

**Regulated Area** – An established area that identifies where airborne concentrations of asbestos fibers exceed, or may be expected to exceed, the PEL. Specific controls are required by OSHA regulation in conducting activities in these areas.

**Removal** – Taking out or stripping substantially all ACM/ACBM from a damaged area, a functional space, or a homogeneous area in a building. (40 CFR 763)

**Repair** – Returning damaged ACM/ACBM to an undamaged condition or intact state so as to prevent fiber release. (40 CFR 763)

**Resilient Floor Covering Institute (RFCI)** – OSHA has accepted that certain RFCI procedures for removing floor coverings will not cause exposures above the OSHA PEL. For a copy of these procedures, see the RFCI Web site at <http://www.rfci.com/index.php> . See the TDSHS statement concerning RFCI procedures at <http://www.dshs.state.tx.us/asbestos/pdf/ARC022.pdf> .

**Respirator** – A respiratory protection device consisting of a facepiece connected either to an air source or to an air-purifying device.

**Response Action** – A term from EPA that means a method, including removal, encapsulation, permanent enclosure, repair, operations and maintenance, that protects human health and the environment from friable ACBM. (40 CFR 763).

**SAI** – Spray-applied insulation, insulating materials containing one or more types of asbestos sprayed on, generally to the interior surfaces of buildings.

**Scanning Electron Microscopy** – A method of microscopic analysis that uses an electron beam directed at a sample and then collects the beams that are reflected to produce an image from which fibers can be identified and counted.

**Self-Contained Breathing Apparatus** – A respiratory protection device usually consisting of a facepiece connected by a hose and a regulator to an air source (compressed air, compressed oxygen, or an oxygen-generating chemical) carried by the wearer.

**Sealant** – A chemical agent applied to ACM to fix the material and reduce the potential for fiber release into the ambient environment (see encapsulant).

**Small Enclosure** – An enclosure providing a control around a job larger than what a glovebag will accommodate, or that is needed to provide more protection than a barrier system. The small enclosure is generally limited in size and used for small-scale, short-duration activities. A small enclosure may not involve the use of negative-pressure systems, but will have an entrance chamber or multiple entry flaps. Small enclosures rely on HEPA-filtered vacuums and wet methods to control fiber concentrations.

**Surfacing Material** – Includes material that is sprayed, troweled on, or otherwise applied to surfaces of ceilings, structural members, and other surfaces for fireproofing, acoustical, and other purposes.

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### Asbestos Glossary (cont.)

**Surfactant** – A chemical wetting agent added to water to improve penetration, thus reducing the quantity of water required for a given operation or area.

**TCEQ** – Texas Commission on Environmental Quality. The TCEQ has established requirements for the disposal of asbestos waste.

**TDSHS** – Texas Department of State Health Services (see below).

**TLV** – Threshold limit value; an airborne exposure guideline developed by the ACGIH (see below).

**TNRCC** – Texas Natural Resource Conservation Commission. The TNRCC was renamed the TCEQ on September 1, 2002.

**TWA** – Time weighted average (see below).

**Threshold Limit Value (TLV)** – An exposure guideline developed by the by the ACGIH to assist in the control of health hazards. The TLV refers to airborne concentrations of substances and represents conditions under which it is believed that nearly all workers may be repeatedly exposed day after day without adverse health effects. The ACGIH TLV for asbestos is 0.1 f/cc, expressed as an 8-hour TWA concentration.

**Texas Department of State Health Services (TDSHS)** - The TDSHS mission is to protect and promote the physical and environmental health of the people of Texas from asbestos.

The TDSHS Asbestos Programs Branch has two programs to meet these concerns. The Licensing Program issues licenses to persons qualified for asbestos-related work in public buildings. The Enforcement Program has regional inspectors available to monitor asbestos removal in buildings, and to respond to community concerns to ensure that public exposure is minimized. The TDSHS has established rules and regulations for asbestos in the Texas Administrative Code, Title 25, Health Services, Part I, Texas Department of Health, Chapter 295, Occupational Health (25 TAC 295). These regulations and other information can be found at the TDSHS Web site for asbestos programs URL: <http://www.TDSHS.state.tx.us/beh/asbestos/>.

The TDSHS has also been designated as the Texas regulatory agency to ensure compliance with the Clean Air Act, NESHAP, and associated EPA standards and regulations. Asbestos emissions from abatement activities and building demolitions are regulated under NESHAP.

**Time Weighted Average (TWA)** – The average concentration of a contaminant in air during a specific time interval.

**Transmission Electron Microscopy** – A method of microscopic analysis that focuses an electron beam onto a thin sample. As the beam penetrates (transmits) through the sample, the difference in densities produces an image on a fluorescent screen from which asbestos fibers can be identified and counted.

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### Asbestos Glossary (cont.)

**Wet Cleaning** – The process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, and other cleaning tools that have been dampened with amended water and of disposing of these cleaning tools as asbestos-contaminated waste.

**Work Area** – The room or space where asbestos-related work or removal operations are performed that is defined and/or isolated to prevent the spread of asbestos dust, fibers, or debris and to prevent entry by unauthorized personnel (see regulated area).

**Worker** – A person engaged in the abatement of asbestos or performing a task in which asbestos exposure is likely. Distinguished from an asbestos worker, who is routinely exposed to asbestos fiber concentration levels in excess of the action level of 0.1 f/cc on an 8-hour TWA.