



ASBESTOS MANAGEMENT PROGRAM

CONTENTS

- 1.0 *PURPOSE*
 - 2.0 *APPLICABILITY AND SCOPE*
 - 3.0 *APPLICABLE REGULATIONS AND STANDARDS*
 - 4.0 *DEFINITIONS*
 - 5.0 *RESPONSIBILITIES*
 - 5.1 *Career and Protective Services Responsibilities*
 - 5.2 *Manager and Supervisor Responsibilities*
 - 5.1 *Employee Responsibilities*
 - 6.0 *PROCEDURES*
 - 6.1 *Asbestos Maintenance*
 - 6.2 *Asbestos Abatement*
 - 6.2.1 *Parties Involved with Asbestos Abatement:*
 - 6.3 *Pre-Abatement Procedure*
 - 6.4 *USC Glove Bag Team Abatement Procedures*
 - 6.4.1 *Responsibilities*
 - 6.4.2 *Documentation*
 - 6.4.3 *Notifications*
 - 6.4.4 *Equipment and Supplies*
 - 6.4.5 *Glove Bag Procedures*
 - 7.0 *PROGRAM APPROVAL AND REVIEW*
-
- Appendix A USC Approved Asbestos Abatement Contractors and Consultants*
 - Appendix B USC Approved Asbestos Transfer, Storage and Disposal Facilities*
 - Appendix C USC Hazardous Materials Abatement Notification*
 - Appendix D Notice of Hazardous Materials Removal Project (for posting)*
 - Appendix E Initial Asbestos Medical Questionnaire*
 - Appendix F Periodic Asbestos Medical Questionnaire*
 - Appendix G USC Glove Bag Job Record Form*
 - Appendix I Cal/OSHA Temporary Worksite Notification of Emergency Asbestos Abatement (Glove Bag use)*

1.0 *PURPOSE*

The USC Asbestos Management Program is intended to minimize exposure to airborne asbestos fibers, and provide an effective plan to manage and control known and assumed asbestos-containing materials throughout the University.

ASBESTOS MANAGEMENT PROGRAM

2.0 APPLICABILITY AND SCOPE

This program applies to all maintenance, construction, demolition and/or renovation activities by all University departments.

3.0 APPLICABLE REGULATIONS AND STANDARDS

- California: Title 8, California Code of Regulations, Section 341.6-341.14 [Asbestos Registration] (8 CCR 1529)
Title 8, California Code of Regulations, Section 1529 (8 CCR 1529)
Title 8, California Code of Regulations, Section 1531 (8 CCR 1531)
Title 8, California Code of Regulations, Section 5208 (8 CCR 5208)
South Coast Air Quality Management District Rule 1403 “Asbestos Emissions from Demolition/Renovation Activities”
California Health and Safety Code 25249.5. “Proposition 65. Safety Drinking Water and Toxics Enforcement Act of 1986” (CHSC 25249.5)
California Health and Safety Code 25915 (CHSC 25915)
- Federal: Title 29, Code of Federal Regulations, Section 1910.20, “Access to Medical and Industrial Hygiene Records” (29 CFR 1910.20)
Title 29, Code of Federal Regulations, 1910.134 [General Industry, Use of Respirators] (29 CFR 1910.134)
Title 29, Code of Federal Regulations, 1910.1001 [General Industry] and Appendices, “Asbestos, Tremolite, Anthophyllite and Actinolite” (29 CFR 1910.1001)
Title 29, Code of Federal Regulations, 1926.58 [Construction Industry] and Appendices, “Asbestos, Tremolite, Anthophyllite and Actinolite” (29 CFR 1926.58)
Title 29, Code of Federal Regulations, 1926.1101 [Construction Industry], “Asbestos” (29 CFR 1910.1101)
Title 40, Code of Federal Regulations, Part 61 Subpart M (Clean Air Act: National Emission Standards for Hazardous Air Pollutants [NESHAP]) (40 CFR 61.M)
Title 40, Code of Federal Regulations, Section 763 Subpart I Section 6 (Toxic Substances Control Act [TSCA]) (40 CFR 763.6)
Title 40, Code of Federal Regulations, 763 Subpart E Sections 80 - 99 (Toxic Substances Control Act [TSCA]) (40 CFR 763.80-99)
Title 40, Code of Federal Regulations, 763 Subpart G Sections 120 - 126 (Toxic Substances Control Act [TSCA]) (40 CFR 763.120-126)

4.0 DEFINITIONS

Asbestos: an incombustible, chemical-resistant, fibrous mineral forms of impure magnesium silicate, used for fireproofing, electrical insulation, building materials, brake linings, and chemical filters. Asbestos includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these minerals that have been chemically treated and/or altered.

ASBESTOS MANAGEMENT PROGRAM

Asbestos-containing material (ACM): any material containing more than 1% asbestos.

Presumed Asbestos Containing Material (PACM): thermal system insulation and surfacing material in buildings constructed no later than 1980.

5.0 RESPONSIBILITIES

All maintenance, construction, demolition and renovation activities on University property must be performed in accordance with all applicable asbestos regulations and with procedures contained in this document. Each department is responsible for assuring that the procedures contained in this program are followed by employees, students, visitors and contractors under their supervision.

The University shall make available at no cost appropriate training and, when required, medical evaluations, to employees whose responsibilities expose them to asbestos-containing materials.

Environmental Health and Safety will oversee the administration of this Program, but ultimate responsibility for implementation rests with each department.

5.1 Career and Protective Services Responsibilities

Career and Protective Services is responsible for:

- Assisting departments with identification of asbestos-containing materials in the work place;
- Assisting employees, students and supervisors with obtaining medical clearance;
- Providing training in asbestos awareness;
- Maintaining training documents and written medical clearance documents;
- Periodically inspecting work areas that contain asbestos-containing materials; and
- Reviewing this written program annually and notifying constituents of changes.

5.2 Manager and Supervisor Responsibilities

Each manager and supervisor affected by this program is responsible for:

- Being familiar with this Asbestos Management Program;
- Informing employees of known or suspected asbestos-containing materials in work areas where they will be present;
- Assuring that proper asbestos warning signs are posted in work areas containing known or suspected asbestos-containing materials;
- Minimizing exposures to asbestos-containing materials by engineering out the asbestos exposure hazard (e.g., abatement, containment), and by limiting the time that employees are exposed to such hazards;
- Assuring that employees who may be exposed to asbestos-containing materials attend asbestos awareness training prior to exposure and annually thereafter;
- Assuring that employees who are exposed to asbestos-containing materials are offered annual medical surveillance and asbestos awareness training prior to and after an exposure above the OSHA PEL;

ASBESTOS MANAGEMENT PROGRAM

- Periodically inspecting work areas that contain asbestos-containing materials; and
- Informing contractors of known or suspected asbestos-containing materials in assigned work area.

5.1 Employee Responsibilities

Each employee affected by this program is responsible for:

- Being familiar with this Asbestos Management Program;
- Never performing a job or being present at any location where asbestos-containing are being disturbed unless all provisions of this Asbestos Management Program are observed;
- Attending asbestos awareness training prior to exposure and annually thereafter (schedule through Professional Development);
- Leaving the area in the event of respiratory equipment malfunction, physical or psychological distress, or other unsafe conditions that require relief;
- Notifying the supervisor of any significant change in medical condition; and
- Notifying the supervisor of any known or suspected asbestos-containing materials in poor condition.

6.0 PROCEDURES

6.1 Asbestos Maintenance

The following procedures for work around asbestos-containing materials apply to maintenance and custodial personnel, and building occupants, inspectors, and their supervisors. Supervisors are responsible for the following:

1. Identify the asbestos-containing materials around which their employees and contractors work (*Environmental Health and Safety is available to assist with identification*).
2. Assure that all employees who work around asbestos-containing materials receive Asbestos Awareness training that is appropriate for their assigned work tasks, and that meets applicable regulations.
3. Provide their employees with written Standard Operating Procedures for work tasks that involve asbestos-containing materials, which:
 - A. assure that the materials will not be disturbed or create an asbestos fiber release;
 - B. assure that any tools or chemicals used will not damage the asbestos-containing materials;
 - C. assure that employees use appropriate tools, work procedures and personal protective equipment; and
 - D. include specific emergency procedures for what to do in the case of a suspected asbestos fiber release.
4. Provide employees with training on the above referenced Standard Operating Procedures.
5. If a suspected asbestos-containing material is found to be in poor condition, follow the procedures below.
 - A. Note the location, condition, date, type of material (e.g., pipe insulation, floor tile), and any unique identifying features. If a piece of red tape is present, write down any identifying numbers

ASBESTOS MANAGEMENT PROGRAM

found on the tape: the numbers correspond to specific sample numbers.

- B. Avoid further disturbing the material or stirring up fallen particulate. If material is severely damaged, or is potentially dust-producing, post a hazard sign, cordon off the area, and call Environmental Health and Safety. Control fiber release by spraying a fine water mist in the area.
- C. Check the Asbestos Sampling Database for information on the material by any of the following means:
 - i. if pipe insulation, look for a label stating either “Asbestos Insulation:” or “Asbestos-Free Insulation;”
 - ii. access the Asbestos Database via <https://shib1.usc.edu/uscnet/login> (contact EHS for database access and training);
 - iii. call EH&S (213-740-6448), Steve Hall (FMS Safety, 213-740-5166), or Landry Kacou (Housing Maintenance, 213-740-2043). These persons can e-mail or fax to you a list of known asbestos-containing materials, or inform you by phone whether a material has been sampled and, if so, whether it contains asbestos.
- D. If the material has been sampled and is known to NOT contain asbestos, repair or patch it as appropriate or report it to Facilities Maintenance (213-740-6833) to schedule repair.
- E. If the material has not been sampled, inform Industrial Hygiene staff (213-740-6448), who will sample the material in question.
- F. If the material is known to contain asbestos, inform the Industrial Hygiene staff (213-740-6448), who will inspect the site and initiate controls or abatement as appropriate.

6.2 Asbestos Abatement

6.2.1 Parties Involved with Asbestos Abatement:

All asbestos abatement projects, regardless of size and scope (except abatement conducted by the USC Glovebag Team), require participation by the following groups:

- Environmental Health and Safety;
- a Project Manager from Facilities Management Services, Auxiliary Services, Housing and Residence Halls, or other campus department;
- an Environmental Consultant selected from the “USC Approved Consultants and Contractors Listing;” and
- an Asbestos Abatement Contractor selected from the “USC Approved Consultants and Contractors Listing.”

Environmental Health and Safety shall provide the following services when asbestos is assumed or is positively identified in materials impacted by a proposed construction project:

1. Make available for pre-construction reference results of any asbestos building material sampling;
2. Assist the Project Manager in selecting an Environmental Consultant to collect and analyze representative samples for positive identification of suspected asbestos-containing materials not reported in existing building surveys;

ASBESTOS MANAGEMENT PROGRAM

3. Assist the Project Manager with consultation regarding the most feasible options for dealing with asbestos;
4. Assist the Project Manager in selecting an Abatement Contractor and an Environmental Consultant if removal of asbestos-containing material is feasible;
5. Assist the Project Manager with pre-construction meetings to inform occupants of abatement;
6. Coordinate with the Abatement Contractor and USC Environmental Specialists to inspect asbestos-containing waste prior to shipment and sign the waste manifest for waste destined for appropriate landfill disposal;
7. Retain copies of documents and final reports associated with USC abatement projects.

The Project Manager from Facilities Management Services, Auxiliary Services, Housing and Residence Halls, or any other campus department shall:

1. Inform Environmental Health and Safety of the intent to perform asbestos abatement activity.
 - a. Fax, mail or e-mail a completed Hazardous Materials Abatement Notification Form to Environmental Health and Safety, to be received at least five working days prior to abatement activity on campus, and
 - b. Inform Environmental Health and Safety at 213-740-6448 of the pre-abatement meeting and job walk so that a representative can attend.
2. Contract and compensate both a state-licensed and certified Abatement Contractor and Environmental Consultant.
 - a. The Abatement Contractor and Environmental Consultant shall be pre-approved by an Abatement Contractor Approval Committee, consisting of representatives from Purchasing, Facilities Management Services, Housing, and Environmental Health and Safety.
 - i. Refer to the current USC Approved Consultants and Contractors Listing for information.
 - b. Provide the Abatement Contractor with the current list of USC-approved landfill sites.
 - i. Refer to the USC List of Acceptable Transfer, Storage and Disposal Facilities generated by Environmental Health and Safety.
 - c. Inform the Abatement Contractor that:
 - i. only Environmental Health and Safety personnel may sign any hazardous waste manifest, and
 - ii. Environmental Health and Safety personnel must inspect the waste prior to transport.
3. Coordinate the asbestos removal project so as to minimize potential disturbance (i.e., noise, access, odors, dust) to building occupants.
4. Provide Asbestos Abatement Notification to building occupants.
 - a. Post the Notice of Hazardous Materials Removal Project on building entrances;
 - b. Arrange and conduct pre-abatement informational meetings to inform occupants of upcoming abatement;
 - c. Inform Aramark Coordinators of the location and time of the abatement before it occurs, so that janitors can be reassigned away from the location for the duration of the abatement.
5. Provide a “sign-off” signature verifying that the asbestos removal was completed in accordance with the original project design specifications.
6. Obtain a project Close-Out Report from the Environmental Consultant, and assure that a copy is

ASBESTOS MANAGEMENT PROGRAM

forwarded to Environmental Health and Safety (mail code 1143).

- a. Assure that the Close-Out Report includes the exact location and a concise description of the asbestos-containing materials that were removed.

The **Environmental Consultant** shall:

1. Act as the University's representative, therefore supervising and controlling the abatement project so that it is performed in accordance with all applicable federal, state and local asbestos regulations.
2. Develop a detailed abatement work specification for complex projects that require timely coordination of construction activities.
3. Perform air monitoring via the collection of air samples in order to verify the control of asbestos-containing dust in the removal process.
4. Document all work performed by the abatement contractor and pertinent information relating to the project.
5. Halt the abatement work and implementing corrective measures when serious problems arise.
6. Generate a final Project Close-Out Report which is to include:
 - a. Copies of all required permits (LAFD, AQMD, etc.);
 - b. Copies of asbestos waste manifests, air monitoring results, bulk sample results if applicable, abatement worker certifications, medical clearances and fit testing records, and project management documentation, including daily field notes; and
 - c. A concise description of the asbestos-containing materials that were removed and the exact location from which they were removed.

The **Abatement Contractor** shall:

1. Notify, file, and obtain all required permits (i.e., AQMD, LAFD) for abatement activity to proceed, and modify those permits with the appropriate agency if the intended project's date and time has been changed.
2. Perform the abatement of asbestos-containing material in a timely and well-controlled manner under the direction of the Environmental Consultant.
3. Supply adequate amounts of manpower and equipment necessary to perform the job safely.
4. Provide personal air monitoring for the contractor's employees;
5. Obtain an appropriate, secured waste dumpster in which to store the asbestos waste until transport;
6. Contract a licensed, certified hazardous waste hauler to transport the asbestos waste to a landfill suitable for hazardous wastes and pre-approved by USC Environmental Health and Safety.
 - a. Refer to the List of Acceptable Transfer, Storage and Disposal Facilities generated by Environmental Health and Safety; and
 - b. Contact Environmental Health and Safety (EHS) at 213-740-6448 at least 24-hours before each scheduled hazardous waste shipment to arrange for a representative from EHS to sign the waste manifest.

ASBESTOS MANAGEMENT PROGRAM

6.3 *Pre-Abatement Procedure*

1. Prior to construction, demolition, or other renovation activities involved with a project, the Project Manager shall review current hazardous materials surveys and additional sampling information from Environmental Health and Safety for the presence of asbestos in the intended work area. If the project will disturb other building materials in a pre-1978 structure, contract with an approved Environmental Consultant for an hazardous materials survey
 - a. Forward a copy of any new hazardous materials surveys to Environmental Health and Safety.
2. If asbestos-containing materials are involved with the proposed project, the Project Manager shall consult with Environmental Health and Safety for management alternatives to asbestos removal.
3. If asbestos abatement is required, the Project Manager shall notify Environmental Health and Safety of intended abatement activity via the Abatement Notification Form. The selection of Environmental Consultants and of Abatement Contractors shall agree with Environmental Health and Safety's Approved Listing of Consultants and Contractors.
4. The Project Manager shall include Environmental Health and Safety in pre-project meetings involving asbestos issues.
5. Copies of the Environmental Consultant's final report document shall be forwarded to Environmental Health and Safety for retention.
6. All pertinent paperwork shall be forwarded to:

USC Environmental Health and Safety

Asbestos Management Program

Stonier Hall (STO 101)

837 Downey Way

Los Angeles, CA 90089-1143

Phone: (213) 740-6448

Fax: (213) 740-082

6.4 *USC Glove Bag Team Abatement Procedures*

When emergency abatement of (only) pipe insulation is required, the USC Glove Bag Team may be mobilized by Facilities Management Services. The USC Glove Bag Team will use the glove bag procedures described below to remove damaged asbestos-containing pipe insulation, e.g., lagging and elbows. An emergency abatement situation is an unplanned event involving significant damage to asbestos-containing materials resulting in the likelihood of an ambient fiber release. Such events include, but are not limited to, non-routine mechanical equipment failure, and damage resulting from fire, flooding, or earthquake. The quantity of asbestos-containing material (ACM) to be removed at a single work site must not exceed a sum total of 100 square feet per calendar year. University Park and Health Sciences Campuses, together, are considered a single work site.

6.4.1 *Responsibilities*

Risk Management and Career Services (RMCS) will maintain all pertinent records relating to University Glove Bag Team asbestos abatement program. Such records consist of: Glove Bag Team

ASBESTOS MANAGEMENT PROGRAM

member certifications, medical evaluations, respirator training and fit test records, glove bag job records, Cal/OSHA notifications, personal air monitoring results, and air clearance results.

Environmental Health and Safety (EHS) will manage, document, and provide required notifications and air monitoring concerning all glove bag asbestos removal jobs on both University Park and Health Sciences Campuses.

Facilities Management Services (FMS) will assign employees to the Glove Bag Abatement Team, provide notification of each glove bag job to EHS, and provide all necessary equipment and supplies. FMS will make those Glove Bag Abatement Team members available for required training. For any glove bag job, FMS will supply only personnel who have current medical approval, current EPA Supervisor/Competent Person Certification, and current respirator certification, in addition to the equipment necessary to perform glove bag removal jobs.

6.4.2 Documentation

All documentation involved with the Abatement Glove Bag Team will be maintained in a central file in Environmental Health and Safety, containing the following sections:

1. **Certifications** - All asbestos abatement team personnel will possess current EPA accredited certification as Supervisor/Competent Person in abatement procedures. Copies of the initial and annual refresher training certificates will be retained in a folder for each individual team member within the program file. All certification copies will be retained indefinitely.
2. **Medical Records** - Physician's statement of approval for abatement will be maintained by Risk Management and Career Services for a minimum of 30 years past the employee's termination of employment with the University. Physical exam records and the Appendix D Medical Questionnaire for each abatement team member will be maintained by the medical provider, in accordance with California's Asbestos Standard for Construction (8 CCR 1529). Upon termination of employment, abatement team members will be offered a release physical examination.
3. **Abatement Job Records and Notifications** - Completed glove bag job records for every in-house abatement performed, and associated temporary work site notifications to Cal-OSHA, will be retained in the program file.
4. **Personal Air Sampling/Clearance Results** - Laboratory results from air sampling in the abatement worker's breathing zone, and final area clearance air sampling data, will be attached to the corresponding job record. Written notification of personal exposure measurements will be sent to monitored team members within 15 days of receipt of the laboratory results, and a copy filed in the employee's file in this section.

ASBESTOS MANAGEMENT PROGRAM

5. **Respirator Training and Fit Test Records** - All abatement team personnel will be trained under the USC Respiratory Protection Program. Documentation pertaining to respiratory protection training and proper respirator fit testing for each abatement team member will be retained according to the requirement of the Respiratory Protection Program. Fit test procedures will conform to the protocols established in 8 CCF 1529 Appendix C. Training and fit testing will be conducted prior to commencement of any abatement activity.

6.4.3 Notifications

When emergency glove bag abatement is necessary,

1. Notify Environmental Health and Safety (EHS) by telephone at 213-740-6448 as soon as possible of the intent to perform emergency abatement.
 - A. EHS must be contacted prior to the job to provide notification to Cal-OSHA, and to calibrate the sampling pumps prior for air monitoring.
 - i. Notification to EHS may be made by abatement team members who will perform the removal job, or by their supervisors.
 - B. Emergency abatement jobs outside normal work days and hours are permitted only under the following conditions:
 - i. The situation requires immediate removal to prevent widespread contamination of the immediate and adjacent areas, and
 - ii. Isolation and control measures, such as enclosing the damaged area in polyethylene sheeting and/or applying encapsulant to the damaged material, are not feasible.
 - iii. Off-hours emergency asbestos abatement require following steps:
 1. Notify Department of Public Safety dispatch personnel at 213-740-6000 of the time, location, and extent of the off-hours abatement work, and request that they immediately inform Risk Management and Career Services on-call personnel;
 2. Follow all glove bag abatement procedures thoroughly;
 3. Keep the work area restricted and isolated by leaving the signage and barrier tape in place until cleared by Environmental Health and Safety; and
 4. Leave a message for EHS at 213-740-6448 describing the off-hours abatement job, so that air clearance monitoring can be conducted as required prior to reopening the room.
2. Follow the “Glove Bag Procedures” listed below.
3. Always use a minimum of two abatement team members to perform glove bag abatement procedures.
 - A. A designated “Leadman” will cut and remove the damaged section using a glovebag..
 - B. The second team member, or “Assistant,” will apply amended water to the work area within the glovebag during the removal process and apply encapsulant to the affected area(s).

6.4.4 Equipment and Supplies

1. Glove bag (vertical or horizontal, as appropriate to access pipe insulation);
2. Six-mil thick polyethylene sheeting to serve as a drop cloth directly under the work area;
3. Duct tape to attach and seal the glove bag to the area from which the asbestos is to be removed;
4. Wetting agent, e.g., amended water, to be applied to the asbestos material;

ASBESTOS MANAGEMENT PROGRAM

5. A three-gallon airless sprayer for application of the wetting agent;
6. Encapsulant to seal and bond together the remaining asbestos material after the targeted section has been removed;
7. A two-liter hand-held airless sprayer for application of the encapsulant;
8. Hand tools, including: utility knives, wire brushes, tin snip, small hand saw suitable for use withing the glove bag;
9. Miscellaneous equipment including: disposable scrub pads, measuring tape, stapler, paper towels, marking pen;
10. Smoke tubes and aspirator bulb to ensure the integrity of the seal joining the glove bag and attachment points.
11. A HEPA-filter-equipped vacuum to provide negative pressure to the glove bag during removal procedures, and to evacuate the residual air inside the glove bag when “goose-necking” the tape sealing the waste material during the post removal tear-down phase.
12. HEPA-filtered dual cartridge half-face respirators for use by each employee performing the asbestos removal.
13. Disposable tyvek full-body protective suits with attached hoods and feet coverings for employees performing the asbestos removal.
14. Air sampling equipment, specifically: personal low-flow and area high-flow sampling pumps with 25mm sample cassettes.
15. Abatement Job Record and copies of the “User Registration” and the “Temporary Worksite Notification, posted on site.
16. Protective signage and barrier tape to placard and isolate the work area. Signage will read “Danger Asbestos — Cancer And Lung Disease Hazard — Authorized Personnel Only — Respirators and Protective Clothing Are Required in this Area.”

6.4.5 Glove Bag Procedures

- 1) Confirm that all necessary equipment and supplies are present at the work site before any work begins.
- 2) Isolate the immediate work area to prevent access by unauthorized personnel by posting asbestos hazard placards and employing barrier tape to establish a work area perimeter.
- 3) Post a copy of the “User Registration” and of the “Temporary Worksite Notification” at the work site for the duration of the abatement procedure.
- 4) Confirm that the Abatement Job Record is complete by documenting the date and location of the job, scope of work, the type and amount of asbestos to be abated, and the persons performing the abatement work.
- 5) Fill the three-gallon airless sprayer with the wetting agent.
- 6) Fill the two-liter hand-held sprayer with an encapsulant/water mixture, mixed according to manufacturer’s directions.
- 7) Assure that each person inside the restricted work area dons a P100 cartridge respirator and conducts positive and negative pressure checks to ensure a good respirator/face seal.

ASBESTOS MANAGEMENT PROGRAM

- 8) Assure that each person inside the restricted work area dons a full-body protective suit. Position the suit hood over the respirator's head straps.
- 9) Attach a calibrated personal sampling pump to the "Leadman" such that the sampling cassette is in the breathing zone for the duration of the abatement job. Turn on the pump.
- 10) Thoroughly wet and then HEPA-vacuum any debris that has shaken loose and is resting on the ground in the area of the work site.
- 11) Place a single layer of 6-mil polyethylene sheeting on the floor as a drop cloth immediately below the work area where the glove bag will be attached. Secure it with duct tape.
- 12) Check the condition of the pipe insulation to be removed. If significantly damaged (i.e., broken lagging, hanging pieces), encapsulate the damaged section and then wrap the entire length of pipe twice in 6-mil polyethylene sheeting and "candy-stripe" it with duct tape. This process will minimize disturbance of the insulation during the removal.
- 13) After wrapping the section, or if the insulation is in good condition, place one layer of duct tape—sticky side out—around the pipe at both ends of where the glove bag will be placed. The tape will provide a good surface on which to attach the ends of the glove bag.
- 14) Prepare the glove bag. If necessary to fit over the pipe, slit the sides of the bag. Place one strip of duct tape along the open edges of the glove bag for reinforcement. Also reinforce the bottom and side seams with a layer of duct tape.
- 15) Place the hand tools and work materials needed into the pouch located inside the glove bag. This will usually include a utility knife, small hand saw, tin snips, disposable scrub brush, and disposable rags.
- 16) Place the glove bag, with tools, around the pipe insulation to be removed. Staple the top edges of the bag together through the reinforcing tape at one inch intervals. Then fold the stapled top flap back against itself and tape it securely down to provide a good seal along the top of the pipe run. Lastly, tape the ends of the glove bag to the pipe using the duct tape attachment points previously placed on the pipe. Ensure that no holes exist within all taped seams.
- 17) Insert a smoke tube with attached aspirator bulb into the glove bag's water sleeve port. Squeeze the bulb several times to generate a visible quantity of smoke inside the glove bag. Remove the smoke tube, then twist and tape closed the sleeve. With the glove bag sealed, gently squeeze the bag and look for smoke leakage at all seams and taped junctions. If a leak is detected, re-tape the problem area and test again with a smoke tube. A proper glove bag seal is obtained when no smoke is observed exiting the bag while being gently squeezed.
- 18) Re-open the water sleeve port and insert the wand for the three-gallon airless sprayer. Using duct tape, seal the water sleeve tightly around the wand using duct tape to prevent air leakage.
- 19) Attach the nozzle of the de-energized HEPA-vacuum hose to the attachment port on the glove bag, and securely tape seal the port and nozzle. Turn on the HEPA-vacuum and manually adjust the glove bag's negative pressure so that the bag is slightly collapsed, or is drawing 0.02" water from the pressure gage.
- 20) Have the "Leadman" place his/her hands into the long-sleeved gloves attached to the glove bag, while the "Assistant" directs the amended water spray onto the material being removed.
- 21) While in the gloves, use appropriate hand tools to cut and remove the insulation. Take special care to avoid puncturing the glove bag when using cutting tools.

ASBESTOS MANAGEMENT PROGRAM

- If an aluminum jacket covers the pipe insulation, cut the attachment bands and remove the jacket using the tin snips. Fold sharp ends inward to avoid puncturing the enclosure. Wrap metal pieces in paper towels or cloth and gently lower them to the bottom of the bag.
 - If insulation is wrapped with hardened canvas cloth, use the utility knife to slit the cloth at both ends of the section to be removed. Make cuts down the length of the pipe, and around the circumference, and peel off canvas cover.
 - Use the hand saw to cut through the insulation at each end of the section to be removed. Spray amended water onto the insulation while cutting to avoid generating excess dust.
 - Once the ends of the insulation are cut, slit the bottom of the section from end to end. Wet the freshly cut areas to reduce dust.
 - Lift the target section off the pipe and gently place it at the bottom of the glove bag, preferably in two intact halves.
- 22) Rinse all re-usable tools with the water spray. Place them into the glove bag's internal pouch.
 - 23) Clean any residual debris from the exposed pipe using the scrub brush and water spray. Wipe it clean until no traces of insulation are visible. Discard disposable materials at the bottom of the glove bag.
 - 24) Pull one glove sleeve inside-out, leaving one glove outside the bag. Using the other hand still inside the glove bag, detach the contaminated tool pouch and place it into the inverted empty glove. With the tools inside the empty glove, twist closed the sleeve of the glove numerous times, and seal it with several layers of duct tape. Cut through the center of the taped area to detach the glove containing the tools. These tools can be placed directly into another bag for further use, or stored for later use.
 - 25) Rinse the interior walls of the glove bag with the water spray to dislodge any asbestos residue.
 - 26) Remove the wand of the airless water sprayer from the water sleeve port. Wipe it clean with a wet disposable cloth as it is withdrawn. Place cloth on drop cloth below for later disposal.
 - 27) Insert the nozzle of the hand-held encapsulant sprayer into the same water sleeve port, and tape seal the sleeve closed. Liberally apply encapsulant to the exposed ends of the remaining insulation, and a thin coat of encapsulant to the interior walls of the glove bag.
 - 28) Remove the wand of the encapsulant sprayer from the bag. Wipe the wand with a wet disposable cloth as it is withdrawn. Place dirty cloth on drop cloth below for later disposal.
 - 29) With the HEPA-vacuum still operating, tape seal all entry ports so that no make up air can infiltrate the bag. This procedure will evacuate and collapse the glove bag.
 - 30) With the bag evacuated and the waste material at the bottom of the bag, twist the entire glove bag several times at the center of the bag. When the neck is tightly constricted, seal the closed bag with duct tape.
 - 31) Turn off the HEPA-vacuum. Carefully withdraw the hose nozzle. Wipe it clean with a wet disposable cloth. Place cloth on drop cloth below for later disposal.
 - 32) With the asbestos waste materials isolated at the bottom of the bag, from beneath, slip a labeled six-mil asbestos disposal bag over the glove bag that is still attached to the pipe. Detach the glove bag by removing the tape from the attachment sites. Carefully close the upper portion of the glove bag by folding the edges inward. Place in the disposal bag.

ASBESTOS MANAGEMENT PROGRAM

- 33) Carefully fold the polyethylene drop cloth and discarded wipe clothes, and place them in the disposal bag with the glove bag waste. Remove the disposable full-body protective suits and place them in the disposal bag.
- 34) Evacuate the air from the disposal bag using the HEPA-vacuum. Then twist the top of the waste bag several times; fold the neck back on itself (“gooseneck”), and tape seal it securely.
- 35) Place the collapsed waste bag into a second labeled disposal bag, so that all waste materials, including discarded protective body suits are double-bagged. Evacuate and seal this outer bag with duct tape as above.
- 36) Securely seal the HEPA-vacuum hose nozzle with duct tape to prevent potential leakage of the vacuum’s content.
- 37) Terminate the personal air sampling. Document the sampling time and pump flow rate.
- 38) Initiate the area clearance sampling.
- 39) Leave the posted work area with all equipment and waste materials. Leave up the barrier tape and protective signage until final air clearance data is obtained from the analytical laboratory. (Note: if the air clearance sample result is ≥ 0.01 f/cc, the entire work area will be immediately wet wiped and encapsulated, and new air clearance sampling conducted. Wet wiping and encapsulation will continue until air fiber concentrations are < 0.01 f/cc or analysis by Transmission Electron Microscopy depicts acceptable ambient fiber concentrations.)
- 40) Remove respirators. Detach filter cartridges. Clean and inspect the respirator after every use. Store the cleaned respirator inside a sealed zip-lock bag.
- 41) Deposit the labeled waste material in the designated asbestos waste disposal bin, and lock the bin. Attach a completed Abatement Job Record to each waste bag.

7.0 PROGRAM APPROVAL AND REVIEW

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By: Jane Bartlett, Alfred M. Bouziane

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Updated phone numbers and instructions to access Asbestos Database