

REMOVAL OF ASBESTOS-CONTAINING MATERIAL

Revised 3/30/2016

ACKNOWLEDGEMENTS

The Board of Regents of The University System of Georgia (USG/BOR), Environmental and Occupational Safety Program would like to thank the Workgroup for assisting with this important Asbestos document.

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This document is prepared to compliment current guidance documents provided by USG/BOR. Further this document supersedes all other documents. If clarification is required, contact the USG/BOR Office of Real Estate and Facilities.

INTRODUCTION

- A. Prior to a project (renovation or demolition), all material that is scheduled to be disturbed shall be sampled by an Accredited Asbestos Inspector and analyzed by an accredited laboratory or Presumed Asbestos Containing Material (PACM) by Responsible Unit Designated Person (this person can be a University Employee, Contractor or outside Consultant). All projects without a Designated Person must coordinate with the Designated Institution Official (DIO). The DIO could be the Facilities Director and/or Environmental and Occupational Safety Director. All projects shall have a Designated Person or DIO for all asbestos projects.
 1. Guidance for this can be found in the 2014 EPA Purple Book as revised and reissued by the Environmental Information Association “Managing Asbestos in Buildings: A Guide for Owners and Managers”. www.EIA-USA.com
 2. If NO ACM is identified or Presumed, Responsible Unit Designated Person must document the results. All documents must be retained electronically and accessible by DIO.
 3. If asbestos is detected in laboratory analysis of $\leq 1\%$, Friable or Non-Friable, Responsible Unit Designated Person and/or DIO can request the material be analyzed using the Point Count method, analyzed using the Transmission Electron Microscopy (TEM) method or declare the material to be below the regulatory amount of $>1\%$. If any Point Count result is $>1\%$, the material is to be considered ACM.
 - a. If declared to be below the regulatory amount, OSHA compliance is still required of the contractor. Awareness training, along with personnel monitoring for Permissible Exposure Limit (PEL), Excursion Limit (EL) and Negative Exposure Assessment (NEA) shall be required and submitted to Responsible Unit Designated Person. All documents must be retained electronically and accessible by DIO.
 4. If asbestos is detected in laboratory analysis of $>1\%$ or PACM, the contractor will be required to comply with these specifications or work plan.
 - ***It should be noted that although this specification covers ACM, if material contains coatings, additional considerations for Lead Based Paint (RRP 40 CFR 745 Certification) and other Toxic Substances and/or Hazardous Materials to include Solid Waste should be reviewed prior to beginning work.***

PART 1 - GENERAL

1.01 GENERAL DESCRIPTION OF WORK

A. The scope of work for asbestos abatement at _____ involves the disturbance of the following friable/non-friable materials to be performed by a Georgia Licensed Asbestos Abatement Contractor:

1. Removal and proper disposal of ACM _____ (sq ft, ln ft, cu ft).

Material shall be determined to be Regulated Asbestos Containing Materials (RACM), Category I Non-Friable Materials or Category II Non-Friable Materials.

When Category I and II Non-Friable materials are disturbed they can become RACM, based on how they are disturbed. When these materials will possibly be rendered Friable, there must be prior approval from Responsible Unit Designated Person and DIO. ACM friability designation and potential designations can be found on Page 2 of the GA EPD Asbestos Project Notification Form (Appendix A). Category I & II must also comply with GA EPD Asbestos Solid Waste Disposal requirements.

B. These Asbestos Abatement Specifications are prepared to be in compliance with National Emission Standards for Hazardous Air Pollutants (NESHAP) and State of Georgia Environmental Protection Division (EPD) Requirements. However, it is important to note that Occupational Safety and Health Administration (OSHA) Regulations apply to materials with any detectable amount of asbestos.

C. All construction debris and trash generated by the abatement of asbestos-containing materials shall be removed from the area on a daily basis and disposed of as asbestos-containing waste.

D. If the project is determined to be under the jurisdiction of Asbestos Hazard and Emergency Response Act (AHERA) regarding schools K-12 and/or daycares, reference below.

- 1. USG/BOR extends the initial asbestos and lead inspections and O&M requirements to include Daycares on our campus.
- 2. For new construction and renovations, only Asbestos Free materials shall be installed.

1.02 MEDICAL REQUIREMENTS

A. Medical Examinations. Before exposure to airborne asbestos fibers, the Contractor will provide workers with a comprehensive medical examination as required by 29 CFR 1926.1101. This examination consists of a pulmonary function test and a chest x-ray at the discretion of the physician performing the physical. The same examination is required on an annual basis to all employees engaged in an occupation involving asbestos fibers.

B. Medical Records. The Contractor shall establish and maintain accurate medical surveillance records for each employee subject to medical surveillance by 29 CFR 1926.1101 and shall maintain the records for the duration of employment plus 30 years in accordance with 29 CFR 1910.20.

1.03 TRAINING CERTIFICATION AND PROJECT SUPERVISION

A. Supervision. An AHERA Accredited Asbestos Abatement Supervisor and OSHA Asbestos Competent Person shall be present at all times that asbestos abatement is in progress. All abatement (including preparation, removal and cleanup) of more than 10 square feet, 10 linear feet involving Regulated Asbestos Containing Material (RACM), must have at least one AHERA Accredited Supervisor present during all work. During abatement of regulated roofing projects, the Supervisor shall be in the immediate work area supervising the

work. The Supervisor shall have completed a course at an EPA approved training center or equivalent certificate course in asbestos abatement procedures. The Supervisor shall have had a minimum of two years on-the-job experience in asbestos abatement procedures and be a competent person as described in 29 CFR 1926.1101.

- B. Worker Training. Prior to assignment to this asbestos work project, the Contractor shall provide instruction to each employee with regard to the hazards of asbestos safety and health precautions and the use and requirements of protective clothing and equipment including respirators. This instruction shall fully cover engineering and other hazard control techniques and procedures, and shall conform to training required by 40 CFR Part 763, Subpart E. The training must be an approved 4-day AHERA Asbestos Worker course.

1.04 PERMITS, LICENSES AND NOTIFICATIONS

- A. The Contractor shall secure the necessary permits in conjunction with asbestos removal, hauling and disposal, and shall provide timely notification of such actions as may be required by Federal, State or Local authorities. Ten working day notice prior to the start of work shall be required to be submitted to Georgia EPD and a copy of this notification shall be submitted to the Owner prior to the start of this work. A copy of the notification shall be posted at the job site at all times.
- B. The Contractor shall coordinate with the Responsible Unit Designated Person and DIO Fire Safety office for any project that restricts or eliminates an egress route. Additionally, all Hot Work shall require a permit.

1.05 RESPIRATORY PROTECTION PROGRAM

- A. The Contractor shall have a written and implemented respiratory protection program that governs the selection, use, maintenance and care of respirators. Workers shall be provided respirators approved by the National Institute for Occupational Safety & Health (NIOSH). The respirators will be used in accordance with Occupational Safety and Health Administration (OSHA) standards.
- B. All respirators must be permanent face-piece (no disposable respirators shall be used) fitted with a HEPA filter (P100) designated by NIOSH for asbestos fiber protection.
- C. The OSHA Competent Person shall evaluate the project to determine if combination respiratory protection will be required.

1.06 CONTINGENCY PLAN

- A. Prepare and submit a contingency/safety plan for emergencies including fire, accident, power failure, pressure differential system failure, supplied air system failures, inclement weather or other events that may require modification or abridgment of decontamination or work area isolation procedures.
- B. Note that nothing in this abatement plan should impede safe exiting or providing adequate medical attention in the event of an emergency.
- C. It is the responsibility of the Contractor to develop, coordinate and post Emergency Response contact information. In lieu of not having a direct contact the Contractor shall dial 911.

1.07 MECHANICAL AND ELECTRICAL SYSTEMS

- A. The Contractor shall take note where mechanical and/or electrical hazards are located and take the necessary precautions in these areas.
- B. Contractor shall coordinate and verify the shutdown, lock, and tag out of all HVAC equipment in or passing through the work area. Seal each intake and exhaust opening and any seam in system components with two sheets of 6-mil polyethylene sheeting and tape.

1. Detach and wet clean removable electrical, heating, and ventilating equipment and other items which may be connected to asbestos surfaces.
2. Remove existing filters from HVAC system and dispose of as asbestos-contaminated waste.

1.08 COMPLIANCE WITH OSHA STANDARDS

- A. It is the intent of this section for the Contractor to comply fully with all Federal, State and Local regulations and codes regarding removal and disposal of asbestos-containing materials. Nothing in this section should be interpreted to conflict with this intent. The Contractor is responsible to ensure worker safety complies with Occupational Safety and Health Administration (OSHA) safety requirements. Hard hats, eye goggles, gloves, and other personal protective equipment, etc., shall be worn when work tasks require this additional safety protection.
- B. No attempt has been made to specify all applicable Federal and/or State requirements dealing with worker safety or public safety within the confines of these specifications. This should not be construed as an abridgment of these requirements. As is always the case, the Contractor has the responsibility to determine which non-specified requirements apply to his work and the responsibility to initiate steps to comply with these non-specified requirements on an as-needed or required basis.

1.09 PRE-SUBMITTAL CONTRACTOR DOCUMENTS

- A. The following documents shall be generated by the Contractor and submitted to the Responsible Unit Designated Person and/or DIO.
 1. Copy of an approved notification for demolition and/or renovation from governing agency (GA EPD) with dates when removal will begin and be completed and appropriate fees paid. Both Friable and Non-Friable (courtesy) notifications shall be sent to EPD
 2. Copy of State of Georgia Asbestos Contractor license
 3. Copy of Asbestos-Abatement Supervisor's current training certificate
 4. Proof of asbestos worker training for each employee involved in the project
 5. Physician release statement for each employee of the Contractor involved in the project
 6. Respirator training for each employee of the Contractor involved in the project
 7. Safety Data Sheets for all Toxic/Hazardous substances involved in the work
 8. Proof of insurance coverage's on behalf of the USG/BOR as required by the Department of Administrative Services and stipulated within the contract documents
 9. Procurement specific requirements shall be attached as stipulated within the contract documents

***All personal information (SS#'s, medical information, etc.) shall be removed prior to submission of both pre and post submittals per HIPPA guidelines.**

Additional documents to be included in the pre-submittals.

1. _____
2. _____

PART 2 - PRODUCTS

2.01 WETTING AGENTS AND ENCAPSULANTS

- A. Surfactant. Provide water to which a surfactant has been added. Use a mixture of surfactant and water that results in wetting of the asbestos-containing material and retardation of fiber release during disturbance.
- B. Encapsulant. Provide an encapsulant designed specifically to lock down asbestos fibers following asbestos abatement. Use in strict compliance with manufacturer's instructions. If ACM material is to be left in-place, Responsible Unit Designated Person and DIO shall review and determine the best application should a bridging or penetrating encapsulant be required.

2.02 POLYETHYLENE PLASTIC SHEETING

- A. Provide polyethylene plastic sheeting in the largest sheet size possible to minimize seams, 4-mil and 6-mil thickness, clear, frosted and/or black, as required.
- B. Where there is a probability of an ignition source or extensive heat, Polyethylene plastic sheeting shall be flame resistant (if required) and conform to the National Fire Protection Association Standard 701, "Small-Scale Fire Test for Flame-Resistant Textiles and Films."

2.03 ADHESIVES

- A. Provide duct tape at least three inches wide with an adhesive formulated to stick aggressively to polyethylene plastic sheeting.
- B. Provide spray adhesive formulated to stick aggressively to polyethylene plastic sheeting.

2.04 DISPOSAL BAGS

- A. Provide 6-mil thick, leak-tight polyethylene plastic bags labeled in accordance with Paragraph k (7) (iii), 29 CFR 1926.1101. Clear disposal bags are the preferred bag.

2.05 HIGH EFFICIENCY PARTICULATE AIR (HEPA) FILTERS

- A. Provide a designed, constructed and maintained HEPA vacuum cleaner, air filtration machine, and respirators with filters capable of filtering particles of 0.3 microns or greater at 99.97% efficiency.

PART 3 - EXECUTION

3.01 EQUIPMENT

- A. Personal Protection
 - 1. Respirators. Provide workers with respirators that are the most comfortable and afford the best seal and protection. Cartridge filters shall be approved for respiratory protection against dusts, fumes and mists having a permissible exposure limit of less than 0.05 milligrams per cubic meter (N, R, P-100). At a minimum, workers shall be provided half-face, negative pressure respirators equipped with the required filter. A clean set of cartridge filters shall be provided to workers upon each entry into the regulated area. All individuals entering the asbestos control area after the commencement of asbestos removal work shall be required to wear respiratory protection.

2. The OSHA Competent Person shall evaluate the project to determine if combination respiratory protection will be required.
3. Protective Clothing. A sufficient number of disposable full body coveralls shall be available to each worker a clean suit upon each entry into the regulated area.

B. Ground Fault Protection

1. Equip all circuits for any purpose entering the regulated area with ground fault circuit interrupters (GFCI). Locate GFCIs outside the regulated area so that all circuits are protected prior to entry into the regulated area. Provide circuit breaker type GFCI equipped with test button and reset switch for all circuits to be used for any purpose in the regulated area, decontamination unit, exterior, or as otherwise required by National Electrical Code, OSHA or other authority. Locate the panel exterior to the regulated area.
2. Use only grounded extension cords; use "hard-service" cords where exposed to abrasion and traffic. Use single lengths or use waterproof connectors to connect separate lengths of electric cords, if single lengths will not reach areas of work.

C. Signs and Labels

1. Warning signs shall be displayed at the entrance to the regulated area. Signs shall be posted at such a distance from the regulated area that an employee may read the signs and take necessary protective steps before entering the area marked by the signs. The warning sign must be in the language of the work crew and potential persons entering the area. The warning signs shall bear the following information:

**DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED IN THIS AREA**

2. Labels shall be affixed to all waste bags or waste wrapped in polyethylene plastic. Labels shall be printed in large, bold letters on a contrasting background and used in accordance with the requirements of 29 CFR 1910.1200(f) of OSHA's Hazard Communication standard, and shall contain the following information:

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

3.02 AIR CIRCULATION AND FILTRATION SYSTEM

- A. Diminished pressure inside the regulated area shall be maintained 24 hours per day for the duration of the project. Duration shall be considered from the time of completion of the installation of primary barriers through the time acceptable final air clearance results are obtained.
- B. A minimum of -0.02 column inches of water pressure differential, relative to outside pressure, shall be maintained as verified and recorded by a manometer positioned at the furthest point possible from the entrance.
- C. The manometer record must be continuous or a minimum of readings to be taken four times during every eight-hour work shift. The record must be verified by a third party representative on behalf of the University.

The negative pressure records shall be maintained at the job site for review and become a permanent part of the completion report for the project.

- D. The inlet sensor of the manometer shall be located at the farthest point from any source of make-up air
 - 1. The manometer must be calibrated prior to the start of each work shift
- E. A high efficiency particulate air (HEPA) filtration system shall be used. The HEPA system shall be capable of collecting and retaining 99.97% of airborne particles with an aerodynamic diameter of .3 microns or larger.
- F. Diminished pressure inside the regulated area shall be maintained with the use of HEPA filtered machines, shall exhaust directly to the exterior of the building, and shall have the capacity to produce, at a minimum, four air changes per hour.
- G. Operate negative pressure differential equipment with HEPA filtration continuously from the time that barrier construction is completed through the time that acceptable final clearance air monitoring results are obtained.

3.03 INSTALLATION OF CRITICAL BARRIERS

- A. Enclose regulated areas by installing critical barriers over all windows, doorways, drains, ducts, grills, grates, diffusers, skylights, etc. Critical barriers shall consist of at least 6-mil thick polyethylene plastic sheeting secured in place with duct tape and/or spray adhesive.
 - **In areas of abatement being performed in areas where return exhaust is through an open plenum, is un-ducted, a 6-mil critical barrier shall be constructed to isolate the un-ducted plenum.**
- B. Contractor, if required as addressed in the pre-construction meeting, will remove all movable objects from the regulated area and place into temporary storage or dispose as construction debris. Pre-clean then cover all non-movable objects remaining in the regulated area with at least one layer of 4-mil polyethylene plastic sheeting secured in place with duct tape and/or spray adhesive. Non-movable objects include but are not limited to: ceiling mounted light fixtures, cabinets, stoves, refrigerators, toilet fixtures, miscellaneous equipment, etc.
- C. Considerations should be made for objects that retain heat, have pilot light systems, energized equipment, transformers, etc. and therefore need a means of ongoing appropriate heat dissipation as discussed in the pre-construction meeting.

3.04 INSTALLATION OF PRIMARY BARRIERS

- A. Cover floors not being abated with at least two layers of 6-mil or thicker polyethylene sheeting. Floor sheeting shall be installed first and shall extend at least 12 inches up the walls and be taped into place. No seams shall be located at wall/floor joints. Spray-applied polyethylene coating shall not be used.
- B. Cover walls not being abated with at least one sheet of 4-mil or thicker polyethylene sheeting. The plastic sheeting shall be secured to within six inches of the floor to a distance of at least three feet up the wall. The plastic sheeting shall be installed to minimize seams. No seams shall be located at wall/wall joints. Seams shall be overlapped a minimum of 12 inches and sealed with duct tape and/or spray adhesive. Ceiling sheeting shall extend at least 12 inches down the wall and be sized and taped into place.
- C. Construct a decontamination enclosure system adjoining the contained work area. The decontamination enclosure shall be built in a manner that will prevent track-out of ACM, and shall consist of: a clean room equipped with appropriate storage containers and adequate space for changing clothing; an air lock; a shower room containing hot and cold or warm running water controllable at the tap; and an equipment room suitable for storage of tools and equipment.

- D. Construct a clear viewing port measuring at least 24 inches by 24 inches in an external wall of the contained work area to allow unobstructed observation of abatement activities in the work area.

3.05 STOP WORK

- A. If critical and/or primary barriers fall or are breached in any manner, stop work immediately. Do not start work until the situation has been corrected and written authorization obtained from the Owner's Representative/third party consultant.

3.06 REMOVAL OF FLOOR COVERINGS AND MASTICS

- A. Use of destructive methods to remove asbestos containing floor coverings and mastics that render these materials friable are discouraged. All floor tile removal is recommended to be notified and completed as a friable project unless approved by the Responsible Unit Designated Person and DIO. The following are three alternate methods for removing floor tile and mastic that aid this objective. One or a combination of each may be successfully used.
 1. Sufficiently wet the floor tile with either an effective wetting solution or surfactant/amended water solution. Allow ample time for the solution to penetrate to the mastic. Remove the floor tile by mechanical means while keeping the entire area of disturbance saturated.
 2. Dry ice may be used in well-ventilated areas only to allow the tiles to contract and break loose from the substrate. Before using dry ice, permission must be obtained from the Responsible Unit Designated Person and DIO.
 3. Heat from infrared machines may soften the mastic enough so that tiles can be pulled up easily. The use of heat guns/machines is limited to electric-powered flameless guns/machines operating below 1,100 degrees Fahrenheit. If tiles are heated and can be removed intact, wetting may be omitted. Tiles must still be wet when placed in disposal bags. Heat guns/machines may not be used on wood flooring. Under OSHA regulation 29 CFR 1926.150, a fully charged ABC-type 20-pound (minimum) fire extinguisher must be available within 100 feet of work utilizing a heat gun/machine. When using a heat gun/machine, an organic filter must be used in conjunction with the HEPA filter and/or all other respirators. The Contractor shall be required to coordinate this method with the DIO Fire Safety office prior to work.
- B. Once the flooring material is removed, and while still wet, place in a 6-mil leak-tight container (bags, lined dumpster, etc.). Completely seal the disposal container with duct tape. Materials packaged inside the regulated area shall be removed without allowing the release of contamination or damaging the personnel decontamination area. If bulk loading materials, care shall be taken to prevent visible emissions both to the air and horizontal surfaces, and any visible emissions shall be immediately cleaned up.
- C. Remove remaining mastic with a solvent or cleaner that does not contain a petroleum based solvent. Scraping of residual mastic shall be performed using wet methods. Expansion joints and wall corners shall be vacuumed with HEPA vacuum for any debris.
- D. All waste materials, including mops, cleaning rags, sorbent material used to remove mastic, shall be disposed of as contaminated waste.
- E. Alternate foam methods may be submitted for approval and will be at the discretion of the Responsible Unit Designated Person and DIO.

3.07 REMOVAL OF WALLBOARD/SHEETROCK, JOINT COMPOUND AND CEILING TEXTURES

- A. When specified, specific wallboard/sheetrock and joint compound shall be removed from the building. This material shall be removed as friable asbestos containing material.
- B. The wallboard-joint compound shall be adequately wet prior to disturbance. The material shall be removed in pieces small enough to safely handle and package for disposal without allowing visible emissions.
- C. Chopping or breaking the material shall be allowed if kept wet and the air continually misted with amended water or a foaming agent. Scraping and/or use of a stiff bristle brush may be used to accomplish removal. Wire brushes and pressure washers are not to be used. Clean even cuts are required on the separation areas that are to remain.
- D. Once the material is removed, and while still wet, place in a 6-mil leak-tight container (bags, lined dumpster, etc.). Completely seal the disposal container with duct tape. Materials packaged inside the regulated area shall be removed without allowing the release of contamination or damaging the personnel decontamination area. If bulk loading materials, care shall be taken to prevent visible emissions both to the air and horizontal surfaces, and any visible emissions shall be immediately cleaned up.

3.08 REMOVAL OF ROOFING MATERIALS

- Contractor shall establish a regulated area around the perimeter of the exterior removal. This area shall be demarcated with signage and barrier tape at a minimum of 20' (or as space permits) from the exterior wall. It is highly recommended that the contractor utilize orange construction fence to prevent access to the area.
- A. Use of destructive methods to remove asbestos containing roofing that render these materials friable are discouraged. Methods shall comply with **1926.1101(g)(8)(ii)**
 - 1. Sufficiently wet the roofing with an amended water or foam solution. Allow ample time for the amended solution to penetrate.
 - 2. Roofing material shall be removed in an intact/non-friable state to the extent feasible. In areas where the asbestos containing material adjoins Non-ACM material, the roof cuts shall be at least 1' into the Non-ACM material to prevent disturbance of ACM. All material removed shall be disposed of as ACM.
 - 3. Wet methods shall be used to remove roofing materials that are not intact/friable, or that will be rendered not intact/friable during removal, unless such wet methods are not feasible or will create safety hazards.
 - 4. Cutting machines shall be continuously misted during use, unless a competent person determines that misting substantially decreases worker safety.
 - 5. When removing built-up roofs with asbestos-containing components using a power roof cutter, all dust resulting from the cutting operation shall be collected by a HEPA dust collector, or shall be HEPA vacuumed by vacuuming along the cut line or by gently wet scooping and then carefully and completely collecting the still-wet dust and debris left along the cut line.
 - 6. Asbestos-containing materials that have been removed from a roof shall not be dropped or thrown to the ground. Unless the material is carried or passed to the ground by hand, it shall be lowered to the ground via enclosed chute, crane or hoist:
 - 7. Intact ACM shall be lowered to the ground as soon as is practicable, but in any event no later than the end of the work shift.
 - 8. Upon being lowered, unwrapped material shall be transferred to a receptacle in such manner so as to preclude the dispersion of dust. This receptacle, typical 30 yard container, shall be lined with 6-mil poly, sealed and covered each night.
- B. Contractor shall comply with 29 CFR 1926.52 Fall Protection for all roofing activities. This will include training, warning line systems, controlled access zones, and described in 29 CFR 1926 Subpart M Appendix

E and comply with Leading Edge Work 29 CFR 1926.501(b)(2).

3.09 REMOVAL OF ASBESTOS SIDING AND GALBESTOS® PANELS

- Contractor shall establish a regulated area around the perimeter of the exterior removal. This area shall be demarcated with signage and barrier tape at a minimum of 20' (or as space permits) from the exterior wall. It is highly recommended that the contractor utilize orange construction fence to prevent access to the area.
- A. When specified, all previously identified asbestos siding panels and Galbestos® panels shall be removed from the building. This material shall be removed intact as much as practical. If initially friable or broken during removal, this shall be removed as friable asbestos containing material. The contractor is to unscrew/unbolt the panel to prevent breakage and lower to the ground intact.
- **If the materials are painted, compliance with the lead requirements is necessary.**
- B. Pre-clean the ground surface or roof deck of any broken asbestos panels using HEPA filtered vacuum and wet methods.
- C. The asbestos coated panels shall be adequately wet or foam prior to disturbance. The material shall be removed in complete pieces as installed if possible.
- D. Scraping and/or use of a stiff bristle brush may be used to accomplish clean-up when the panel is removed. Wire brushes and pressure washers are not to be used.
- E. If removal is accomplished on the exterior of the building, protective measures and regulated barriers shall be utilized to prevent contamination of any surrounding areas.
- F. Seal one layer of 6-mil polyethylene plastic sheeting to the base of the exterior wall directly below the material to be removed. Sheeting shall extend a minimum six feet to either side of the end wall. Allow the plastic sheeting to drape onto the ground and to a point not less than six feet from the exterior wall. This layer of plastic shall be weighted to prevent displacement by wind.

3.10 REMOVAL OF PIPE ELBOWS/JOINTS BY GLOVEBAG

- A. All applicable OSHA requirements and glove bag manufacturer's recommendations shall be met during glove bagging operations. For removal of pipe elbows and joints, a regulated area shall be established on the grounds surrounding the pipe area in the facility by erecting barriers extending a minimum of fifteen (15) feet from the center of the glove bag area. Warning tape and caution signs shall be used which will alert unprotected individuals and prevent them from accidentally entering the regulated area.
- B. Barriers shall be erected using two (2) strands of warning tape between stanchions: the first tape shall be twelve (12) inches from the ground; the second tape shall be no more than forty-eight (48) inches from the ground. Caution signs shall be suspended between the strands of warning tape no more than ten (10) feet apart. Warning signs shall read as follows:

DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED
IN THIS AREA

- C. All movable objects will be cleaned then removed from the regulated area. Pre-clean objects remaining in the regulated area using a HEPA vacuum and/or wet cleaning methods. Cover all objects with at least one layer of 4-mil polyethylene plastic sheeting secured in place with duct tape and/or spray adhesive.
- D. Seal one layer of 6-mil polyethylene plastic sheeting to the floor directly below the elbow/joint to be removed. Sheeting shall extend a minimum six feet to either side of the center point. This layer of plastic shall be secured to prevent displacement by wind.
- E. Mix the surfactant/foaming agent with water in the garden sprayer, following the manufacturer's directions.
- F. Check closely the integrity of the glove bag to be used. Check all seams, gloves, sleeves, and glove openings. OSHA requires the bottom of the bag to be seamless.
- G. If required, carefully remove the non-ACM ceiling tile. Clean the ceiling tile, frame and rails using a HEPA vacuum and wet cleaning methods. A lock-down should be applied to the back side of cleaned ceiling tile. Set the ceiling tile aside for reinstallation. Heavily contaminated ceiling tiles should be wetted and lowered into a disposal bag.
- H. Attach glove bag with required tools and supplies inserted into the bag, per manufacturer's instructions.
- I. Using the smoke tube and aspirator bulb, test 100% of glove bags by placing the tube into the water porthole (two-inch opening to glove bag), and fill the bag with smoke and squeeze the bag. If leaks are found, they should be taped closed using duct tape or spray adhesive and the bag should be retested with smoke.
- J. Insert the wand from the water sprayer through the water porthole.
- K. Insert the hose end from a HEPA vacuum into the upper portion of the glove bag. The second worker will control the HEPA vacuum operation and the water sprayer.
- L. Wet and remove the pipe insulation/elbow.
- M. When the work is complete, spray the upper portion of the bag and clean-push all residue into the bottom of the bag with the other waste material. Be very thorough. Use adequate water.
- N. Put all tools, after washing them off in the bag, in one of the sleeves of glove bag and turn it inside out, drawing it outside of the bag. Twist the sleeve tightly several times to seal it and tape it several tight turns with duct tape. Cut through the middle of the duct tape and remove the sleeve. Put the sleeve in the next glove bag or put it in a bucket of water to decontaminate the tools after cutting the sleeve open.
- O. Turn on the HEPA vacuum and collapse the bag completely. Remove the vacuum nozzle, seal the hole with duct tape, twist the bag tightly several times in the middle, and tape it to keep the material in the bottom during removal of the glove bag from the pipe.
- P. Slip a disposal bag over the glove bag (still attached to the pipe). Remove the tape securing the ends, and slit open the top of the glove bag and carefully fold it down into the disposal bag. Gooseneck the bagged waste materials.
- Q. If the glove bag is breached in any manner that could allow the passage of dust onto interior parts of the facility, the affected area shall be added to the regulated area and decontaminated as described elsewhere in these procedures.

3.11 REMOVAL OF THERMAL SYSTEM INSULATION (TSI)

- A. Thermal system insulation (TSI) shall be removed using the wet method.
1. Wet TSI with a fine mist of amended water or foaming agent. Allow time for material to become saturated to the substrate. Do not over saturate to cause dripping. Remove the material from the substrate in manageable quantities.
 2. Remove residue remaining on substrate after scraping, using a stiff nylon bristled hand brush or scrub pads. If encapsulant is to be applied after removal, all residue must be removed before encapsulant is applied. Keep substrate moist during cleaning. Do not allow to dry.
 3. Place material in pre-labeled disposal bags while still wet. Wipe bags clean and place in a second disposal bag and move to the equipment wash down station. Do not permit large quantities of material to collect before bagging, and do not allow material to dry.
 4. Once the material is removed, and while still wet, place in a 6-mil leak-tight container (bags, lined dumpster, etc.). Completely seal the disposal container with duct tape. Materials packaged inside the regulated area shall be removed without allowing the release of contamination or damaging the personnel decontamination area. If bulk loading materials, care shall be taken to prevent visible emissions both to the air and horizontal surfaces, and any visible emissions shall be immediately cleaned up.
- B. Contractor may elect to remove pipe and pipe insulation or duct and duct insulation intact, in sections. If this method is selected, the following shall apply:
1. Wet TSI with a fine mist of amended water or foaming solution. Allow time for solution to saturate material to the substrate. Do not over saturate to cause dripping.
 2. Cut pipe or ductwork in lengths that can be easily handled by two workers (not more than about 8 feet). Wrap the entire length of pipe in 6-mil polyethylene plastic sheeting and seal with duct tape and/or spray adhesive. Consider whether double wrapping is necessary to prevent visible emissions during handling. Ensure ends are secured to prevent water leaks. Candy-stripe the entire length of pipe using duct tape.

Diminished pressure shall be maintained at all times until final inspection and approval of the work area by the consultant.

3.12 REMOVAL OF ASBESTOS CEMENTITIOUS PANELS

- Contractor shall establish a regulated area around the perimeter of the exterior removal. This area shall be demarcated with signage and barrier tape at a minimum of 20' (or as space permits) from the exterior wall. It is highly recommended that the contractor utilize orange construction fence to prevent access to the area.
- A. When specified, all previously identified asbestos siding panels and Galbestos® panels shall be removed from the building. This material shall be removed intact as much as practical. If initially friable or broken during removal, this shall be removed as friable asbestos containing material. The contractor is to unscrew/unbolt the panel to prevent breakage and lower to the ground intact.
- **If the materials are painted, compliance with the lead requirements is necessary.**
- B. Pre-clean the ground surface or roof deck of any broken asbestos panels using HEPA filtered vacuum and wet methods.

- G. The asbestos coated panels shall be adequately wet or foam prior to disturbance. The material shall be removed in complete pieces as installed if possible.
- H. Scraping and/or use of a stiff bristle brush may be used to accomplish clean-up when the panel is removed. Wire brushes and pressure washers are not to be used.
- I. If removal is accomplished on the exterior of the building, protective measures and regulated barriers shall be utilized to prevent contamination of any surrounding areas.
- J. Seal one layer of 6-mil polyethylene plastic sheeting to the base of the exterior wall directly below the material to be removed. Sheeting shall extend a minimum six feet to either side of the end wall. Allow the plastic sheeting to drape onto the ground and to a point not less than six feet from the exterior wall. This layer of plastic shall be weighted to prevent displacement by wind.

3.13 REMOVAL OF PLASTER

- A. When specified, all plaster and associated support structure shall be removed from the building. This material shall be removed as friable asbestos containing material.
- B. The plaster shall be adequately wet prior to disturbance. The material shall be removed in pieces small enough to safely handle and package for disposal.
- C. Chopping or breaking the material shall be allowed if kept wet and the air continually misted with water. Scraping and/or use of a stiff bristle brush may be used to aid in removal and cleaning. Wire brushes and pressure washers are not to be used. Diminished pressure shall be maintained at all times until final inspection and approval of the work area by the consultant.
- D. Once the material is removed, and while still wet, place in a 6-mil leak-tight container (bags, lined dumpster, etc.). Completely seal the disposal container with duct tape. Materials packaged inside the regulated area shall be removed without allowing the release of contamination or damaging the personnel decontamination area. If bulk loading materials, care shall be taken to prevent visible emissions both to the air and horizontal surfaces, and any visible emissions shall be immediately cleaned up.
- E. The Supervisor shall have additional safety discussions with DIO and the workers when removing plaster attached to wire lathe to prevent injury and cuts.

3.14 REMOVAL OF EXTERIOR WINDOW CAULKING

- A. When specified, all window caulking shall be removed prior to window demolition. Spray a fine mist of amended water on the windows prior to removing the caulking. Once window caulking is removed, place it immediately into a plastic disposal bag. This material shall be removed intact as much as practical.
- B. A regulated area shall be established on the grounds surrounding the area in the facility by erecting barriers extending a minimum of fifteen (15) feet from the base of the facility. Warning tape and caution signs shall be used which will alert unprotected individuals and prevent them from accidentally entering the regulated area.
- C. Barriers shall be erected using two (2) strands of warning tape between stanchions: the first tape shall be twelve (12) inches from the ground; the second tape shall be no more than forty-eight (48) inches from the ground. Caution signs shall be suspended between the strands of warning tape no more than ten (10) feet apart. Warning signs shall read as follows:

DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD

**RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED
IN THIS AREA**

- D. Seal one layer of 6-mil polyethylene plastic sheeting to the base of the exterior wall directly below the caulking to be removed. Sheeting shall extend a minimum six feet to either side of the window. Allow the plastic sheeting to drape onto the ground and to a point not less than six feet from the exterior wall. This layer of plastic shall be weighted to prevent displacement by wind.

ADDITIONAL PROCEDURES IF REMOVING ENTIRE WINDOW:

- E. Place critical barriers constructed of 6-mil polyethylene plastic sheeting over all windows, doors, and other openings into the building from the interior side that are located within the regulated area. Secure critical barriers in place with duct tape and/or spray adhesive.
- F. Pre-clean the window frames and sills using a HEPA vacuum and wet cleaning methods.
- G. Destructive methods to remove windows shall not be used. Spray a fine mist of amended water on the windows while in the process of removing them. Once windows are removed and while still wet, wrap in two layers of 6-mil polyethylene plastic sheeting, seal with duct tape and/or spray adhesive, and move to a temporary storage area such as a covered truck or enclosed dumpster. Do not place windows on the ground or stockpile inside the facility.
- H. If critical barriers are breached in any manner that could allow the passage of dust into interior parts of the facility, the affected area shall be added to the regulated area and decontaminated as described elsewhere in these procedures.

• **PROTECTION FROM INCLEMENT WEATHER**

- I. In the case of window removal, Contractor shall be prepared to respond immediately to unexpected inclement weather conditions and protect the interior of the building from water and/or storm damage. Protection shall be in the form of 6-mil (or greater thickness) reinforced polyethylene plastic sheeting.
- J. After completion of the window removal, the contractor shall install a ¾ inch sheet of marine grade plywood, caulked on the edges to serve as a temporary security and weather barrier.

3.14 REMOVAL OF UNDERGROUND CEMENTITIOUS PIPING

Currently, regulations for underground utilities are being reviewed. The Georgia Utilities Contractors Association(GUCA) along with GA EPD are preparing guidance documents for this work. Upon completion, it will be added to this document. OSHA and Solid Waste rules shall be followed for the disturbance of underground cementitious piping.

PART 4 - CLEANING

4.01 REGULATED AREA CLEANING

- A. Work of this section begins with the cleaning of the regulated area with the following in place:
1. Critical barriers over openings, doorways, windows, HVAC ducts, etc.
 2. Primary barriers over walls, ceilings and floors.
 3. Decontamination facilities for personnel and equipment in operating condition.

4. Negative pressure air filtration system in continuous operation.

4.02 FIRST CLEANING

- A. Carry out a first cleaning of all surfaces in the regulated area by spraying a fine mist of amended water followed by wiping all surfaces with clean disposable rags or towels.
- B. Immediately following this cleaning, remove primary barriers and the equipment decontamination unit (load-out) leaving:
 1. Critical barriers over openings, doorways, windows, HVAC ducts, etc.
 2. Decontamination unit for personnel in operating condition.
 3. Negative pressure air filtration system in continuous operation.

4.03 SECOND CLEANING

- A. Perform a second cleaning in the exact manner and order as the first cleaning.

4.04 ABATEMENT CONTRACTOR'S INSPECTION

- A. Following this second cleaning, visually inspect all surfaces. Re-clean if any dust, debris, etc., is found. Continue this cleaning process until no debris, dust or other material is found.
- B. Wait 96 air changes to allow HEPA filtered fan units to clean air of airborne asbestos fibers. Maintain air filtration system in operation for the entire 96-air change period.

4.05 FINAL CLEANING

- A. Carry out a final cleaning of all surfaces in the regulated area in the same manner as the previous cleaning.

4.06 VISUAL INSPECTION

- A. After final cleaning perform a complete visual inspection of the entire regulated area including all surfaces as specified above; look for debris from any source, residue on surfaces, dust or other matter. When the area is visually clean and no debris, residue, dust or other material is found, complete the certification attached as per Appendix B. Visual inspection is not complete until confirmed in writing.
- B. Provide a minimum of 100-foot candles of lighting on all surfaces in the areas to be subjected to visual inspection. Provide hand held lights providing 150-foot candles at 4 feet capable of reaching all locations in regulated area.

4.07 FINAL AIR CLEARANCE TESTING

- A. After the regulated area is found to be visually clean, encapsulated, and allowed to thoroughly dry, final air clearance samples will be taken and analyzed. Final air clearance must be attained via PCM and/or TEM analysis methods.
 1. If Release Criteria are not met, repeat final cleaning and continue decontamination procedures from that point.
 2. If Release Criteria are met, remove regulated area isolation.

4.08 REMOVAL OF REGULATED AREA ISOLATION

- A. After all cleaning and testing requirements have been met:
1. Shut down and remove the air filtration system. Seal HEPA filtered fan units, HEPA vacuums and similar equipment with 6-mil polyethylene sheet and duct tape to form a tight seal at intake end before being moved from regulated area.
 2. Remove critical barriers. Remove any small quantities of residual material found upon removal of the plastic sheeting by wet wiping, HEPA filtered vacuum cleaners and local area protection. If significant quantities as determined by the Owner's Representative are found, then the entire area affected shall be decontaminated.
 3. Remove all equipment, material, and debris from work site.
 4. Dispose of all asbestos-containing waste material in accordance with Federal, State and Local regulations.
 5. Perform a final inspection.

4.09 CERTIFICATE OF VISUAL INSPECTION

- A. Attached is a Certificate of Visual Inspection that shall be completed by the Contractor for each regulated area and certified by a representative of the independent testing firm. Submit completed certificate with application for payment to the Owner.

PART 5 - AIR MONITORING

5.01 AREA AIR SAMPLES

- A. An independent air monitoring firm will be engaged to perform area air monitoring during abatement activity. The firm selected shall utilize an individual properly trained as an Air Sampling Professional.
- B. The air monitoring firm's representative shall be on site each day asbestos abatement activities are conducted.
- C. The air sampler shall collect area air samples from outside the work area at the entrance to the personnel decontamination unit, at the air filtration exhaust, as well as other areas inside the building but outside the work area. Personnel samples may also be collected. The collection media used for air samples shall be a mixed cellulose ester filter having a pore size less than or equal to 0.8 to 1.2 micrometer and a backup pad. Phase Contrast Microscopy (PCM), NIOSH Method 7400, shall be used to analyze area samples collected and results shall be available within 24 hours. Phase Contrast Microscopy (PCM) will be used in analyzing air samples. Verbal reports of analysis results shall be available within 24 hours and written reports shall be provided to the Owner within 10 working days following completion of the project.

5.02 FINAL CLEARANCE AIR SAMPLE RELEASE CRITERIA

- **Any deviation from Final Clearance Criteria will need approval from the Board of Regents, Office of Real Estate Facility Vice Chancellor.**
- A. PCM and TEM clearance will be required based on the table below.
- B. PCM final clearance air samples shall be collected and analyzed by NIOSH Method 7400. Five samples and two blanks will be collected from within each regulated area using a 25-mm cassette. The collection media will be a mixed cellulose ester filter having a pore size less than or equal to 0.8 to 1.2 micrometer and a backup pad.

- C. A sufficient volume of air shall be drawn for each sample to provide a detection limit of 0.005 fibers per cubic centimeter of air (f/cc). Samples shall be analyzed using the NIOSH Method 7400.
- D. Decontamination of the regulated area will be considered complete if the PCM concentration of fibers for all five samples is less than or equal to 0.01 fibers per cubic centimeter (0.01 f/cc) of air. If at least one of the five sample results is greater than 0.01 f/cc, decontamination of the regulated area is not complete.
- E. The clearance standard for TEM is less than or equal to 70 s/mm² using the Mandatory TEM Method described in 40 CFR 763, Appendix A of Subpart E, as amended, and any subsequent amendments and editions. TEM sampling shall be conducted after PCM final air clearance.
- F. If decontamination of the regulated area is not confirmed, the Contractor will be required to re-clean the area and perform additional PCM final testing. Such re-cleaning, retesting and rush analysis shall be performed at no additional cost to the Owner.

MINIMUM CLEARANCE CRITERIA BASED ON MATERIAL AND PROJECT SIZE

NESHAP CATEGORY		< 16SF/26/LF	> 16SF/26/LF	> 160SF/260/LF	> 3,000SF/1,000LF
Before	During				
1	1	1P	3P	3P	3T
1	RACM	3P	3T	3T	5T
2	2	3P	3T	3T	5T
2	RACM	3T	5T	5T	5T
RACM		3T	5T	5T	5T

1=NESHAP Cat I

2=NESHAP Cat II

RACM= NESHAP Cat RACM

P=PCM 0.01f/cc @ 3,000L

T=TEM 70S/mm² @ 1,200L

Please refer to GA EPD Asbestos Notification Form, Page 2 for NESHAP Category and the Category the material will likely become when abated.

PART 6 - DISPOSAL OF ASBESTOS-CONTAINING WASTE

6.01 ASBESTOS WASTE

- A. Asbestos-containing waste shall be completely sealed in polyethylene plastic or sealed in pre-labeled, 6-mil polyethylene plastic disposal bags. Bags will be wiped clean and placed inside a second disposal bag and sealed with duct tape. Disposal bag labels shall be in accordance with 29 CFR 1926.1101, 40 CFR Part 61 Subpart M, and 49 CFR 172.
- B. All sealed and bagged waste will be placed in a locked truck cargo area or dumpster to prevent access by unauthorized personnel. Exercise care before and during transport to insure that no unauthorized persons have access to the material. All waste is to be transported to a landfill by a waste hauler with all required licenses, and can only be transported to a landfill licensed to receive asbestos containing waste.
- C. Retain receipts from landfill or processor. At completion of the project, submit copies of waste manifests, chain of custody forms, and landfill receipts to the Owner with request for final payment.
- D. A Waste Shipment Record (WSR) shall be prepared for all asbestos waste materials generated by this project. Copies of WSR shall be made available to the facility Owner.

PART 7 - PROJECT CLOSEOUT

7.01 DAMAGE REPAIR

- A. Any damage to surfaces and/or building components, other than those designated for demolition, caused by the Contractor's activity or his workers shall be repaired or replaced at no additional cost to the Owner.

7.02 FINAL CONSTRUCTION SITE CLEAN UP

- A. Work of this section shall be performed once the Contractor has successfully passed all required final visual inspections and final air clearance testing of the regulated areas, and all asbestos-containing waste has been properly removed from the work site.
- B. Prior to Owner's Representative's final inspection, the Contractor shall remove from within and around the building all debris, waste, trash, etc., generated by the Contractor's workers.

7.03 FINAL INSPECTION

- A. The Owner's Representative shall set a date for the final inspection when a notice of readiness for final inspection is received from the Contractor. During this inspection the Owner's Representative shall make a written list of any deficiencies.
- B. When any deficient items have been corrected and accepted by the Owner's Representative, the Contractor shall inform the Owner

7.04 POST-SUBMITTAL DOCUMENTS

- A. The following documents shall be submitted to the Owner:
 - 1. Copy of an approved notification for demolition and/or renovation from governing agency with dates when removal will begin and be completed
 - 2. Copy of State of Georgia Asbestos Contractor license
 - 3. Copy of Asbestos-Abatement Supervisor's current training certificate
 - 4. Proof of asbestos worker training for each employee involved in the project
 - 5. Medical examination report for each employee of the Contractor involved in the project
 - 6. Respirator training for each employee of the Contractor involved in the project
 - 7. "Worker Release Form" for each employee of the Contractor involved in the project
 - 8. Safety Data Sheets for all hazardous chemicals incorporated in the work
 - 9. Regulated area sign in/sign out sheets and daily logs maintained by the Contractor's asbestos abatement supervisor
 - 10. Daily Manometer records
 - 11. Certificate of Visual Inspection for each regulated area signed by the Contractor and a representative of the Owner
 - 12. Waste Shipment Records and Chain of Custody Forms for asbestos waste.

13. GA EPD Project Completion Notification

- B. Post-submittals shall be bound in three-ring binders with each section tabbed or separated by a colored sheet of paper and cross-referenced to an index. The cover shall be labeled with the project name and inclusive dates. Four (4) copies of the post-submittals shall be forwarded to the Consultant, Responsible Unit Designated Person and DIO at the following address within 10 days of project completion.
- C. Electronic submission may be accepted by Responsible Unit Designated Person and DIO. Each section above along with a cover and index shall be in PDF format and each section a different file. A CD labeled with the project name shall also be submitted with the PDF files.



CERTIFICATION OF VISUAL INSPECTION FOR ASBESTOS ABATEMENT

In accordance with SECTION 4.09 - **CERTIFICATE OF VISUAL INSPECTION**, the Contractor hereby certifies that he has visually inspected all interior surfaces of the regulated area identified below and has found no dust, debris, or residue.

Area inspected: _____

By: (Signature): _____ Date: _____

(Print Name) _____

(Print Title) _____

OWNER'S REPRESENTATIVE'S CERTIFICATION

An authorized representative of the Owner hereby certifies that he has accompanied the Contractor on his visual inspection and verifies that this inspection has been thorough and to the best of his knowledge and belief, the Contractor's certification above is a true and honest one.

By: (Signature): _____ Date: _____

(Print Name) _____

(Print Title) _____

Final payment will not be processed until a signed copy of this form has been submitted with close-out documents per 7.04 and an invoice.

CERTIFICATE OF WORKERS ACKNOWLEDGMENT-ASBESTOS

PROJECT NAME: _____

PROJECT ADDRESS: _____

CONTRACTOR'S NAME: _____

WORKING WITH ASBESTOS CAN BE DANGEROUS. INHALING ASBESTOS FIBERS HAS BEEN LINKED WITH VARIOUS TYPES OF CANCER. IF YOU SMOKE AND INHALE ASBESTOS FIBERS THE CHANCE THAT YOU WILL DEVELOP LUNG CANCER IS GREATER THAN THAT OF THE NON-SMOKING PUBLIC.

Your employer's contract with the Owner for the above project requires that: You be supplied with the proper respirator and be trained in its use. You will be trained in safe work practices and in the use of the equipment found on the job. You will receive a medical examination. These things are to have been done at no cost to you.

RESPIRATORY PROTECTION: You must have been trained in the proper use of respirators, and informed of the type or respirator to be used on the above referenced project. You must be given a copy of the written respiratory protection manual issued by your employer. You must be equipped at no cost with the respirator to be used on the above project.

TRAINING COURSE: You must have been trained in the dangers inherent in handling asbestos and breathing asbestos dust and in proper work procedures and personal and area protective measures. The topics covered in the course must have included the following:

1. Physical characteristics of asbestos
2. Health hazards associated with asbestos
3. Respiratory protection
4. Use of protective equipment
5. Pressure Differential Systems
6. Work practices including hands-on or on-job training
7. Personal decontamination procedures
8. Air monitoring, personal and area

MEDICAL EXAMINATION: You must have had a medical examination within 12 months at no cost to you. The examination must have included: Health history, pulmonary function tests, and may have included an evaluation of a chest x-ray.

By signing this document you are acknowledging only that the Owner of the building you are about to work in has advised you of your rights to training and protection relative to your employer, the Contractor.

SIGNATURE _____

SOCIAL SECURITY No. XXX-XX- _____

PRINT

NAME: _____ **WITNESS:** _____