

****FIRST DRAFT****
(October 11, 1985)

.0 Definitions

- .1 Abatement - procedures to control fiber release from asbestos-containing materials. This includes removal, enclosure encapsulation and repair.
- 1.2 Agent - Any individual performing work on an asbestos project for the Asbestos Abatement Entity, that is not an employee of the Contractor (e.g. Subcontractor).
- 1.3 Aggressive sampling - a method of sampling where the person collecting the air samples uses an electric fan or other device to stir up settled dust and simulate activity of that area of the building.
- 1.4 AIHA - The American Industrial Hygiene Association, 475 Wolf Ledges Parkway, Akron, Ohio 44311.
- 1.5 Airlock - A system for permitting entrance and exit with minimum air movement between a contaminated area and an uncontaminated area, typically consisting of two curtained doorways separated by a distance of at least three feet such that one passes through one doorway into the airlock, allowing the doorway sheeting to overlap and close off the opening before proceeding through the second doorway, thereby preventing flow-through contamination.
- 1.6 Air Sampling - The process of measuring the fiber content of a known volume of air during a specified period of time. The procedure utilized for asbestos follows the NIOSH Standard Analytical Method for Asbestos in Air P&CAM 239 or Method 7400. In addition, transmission electron microscopy methods may be utilized for lower detectability and specific fiber identification.
- 1.7 Air Sampling Professional - The professional contracted or employed to supervise air monitoring and analysis schemes. This individual is also responsible for recognition of technical deficiencies in worker protection equipment and procedures during both planning and on-site phases of an abatement project if a consultant is not present. This individual shall be certified or core certified in the Comprehensive Practice of Industrial Hygiene and completed NIOSH Course #582 "Sampling and Evaluating Airborne Asbestos Dust". This individual shall inform the building owner and contractor of violations and improper procedures. If violations are not immediately corrected then the air sampling professional shall notify the Department as soon as possible and then document the violations in writing. The air sampling professional shall be employed by the building owner and not by the contractor.
- 1.8 Amended water - Water to which a surfactant has been added.
- 1.9 ANSI - The American National Standards Institute, 1430 Broadway, New York, New York 10018.
- 1.10 Area air sampling - any form of air sampling where the sampling device is placed at some stationary location. Area air sampling is conducted each day during an asbestos abatement project. Sampling locations include inside the work area, outside the work area, and outside the building.

- .11 Asbestos - The asbestiform varieties of serpentine (chrysotile), riebeckite (crocidolite), cummingtonite - grunerite (amosite), anthrophyllite, and actinolite, and tremolite.
- .12 Asbestos Project - Any activity involving the removal, encapsulation, enclosure, renovation, repair, demolition or other disturbance of friable asbestos containing materials.
- .13 Asbestos Abatement Entity - Any individual partnership, firm, association, corporation, sole proprietorship or other business concern as well as any governmental, religious or social organization or union with one or more employees or members which performs asbestos removal or encapsulation.
- 1.14 Asbestos containing material (ACM) - Material composed of asbestos of any type and in an amount greater than 1% by weight, either alone or mixed with other fibrous or non-fibrous materials.
- 1.15 Asbestos-containing waste material - ACM or asbestos contaminated objects requiring disposal.
- 1.16 Asbestos project manager - An individual designated as the building owners representative and responsible for overseeing the asbestos abatement project. This individual has the same function as a consultant but is a full time employee of the building owner. Example: company industrial hygienist.
- 1.17 ASTM - The American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.
- 1.18 Authorized visitor - the building owner, and any representative of a regulatory or other agency having jurisdiction over the project.
- 1.19 Auxiliary Purposes - Work activity which does not directly involve the performance of an asbestos abatement project but may, in the process of assisting in the performance of that project, disturb or be exposed to asbestos or asbestos-containing materials.
- 1.20 Background level monitoring - A method used to determine airborne asbestos fiber concentrations inside or outside a building prior to starting an asbestos abatement project.
- 1.21 Building owner - The person to whom legal title to the building is vested, unless the premises is held in land trust in which instance the building owner means the person in whom beneficial title is vested.
- 1.22 Clean room - An uncontaminated area or room which is a part of the worker decontamination enclosure with provisions for storage of workers' street clothes and protective equipment.
- 1.23 Clearance air monitoring - The employment of aggressive sampling techniques to determine the airborne concentrations of residual fibers upon conclusion of an asbestos abatement project.
- 1.24 Consultant - An architect, consulting engineer or other professional who acts as the building owner's representative to ensure that a proper

asbestos abatement project is performed. Although the use of a consultant is not required by this chapter, if employed this individual shall be responsible for ensuring that applicable regulations are complied with. The consultant shall notify the Department as soon as possible upon completion of the project of any violations that are not immediately corrected. Documentation in writing shall be submitted to the Department of uncorrected violations upon completion of the project. The consultant should also attempt to ensure that improper procedures not specifically proscribed by regulation are corrected. These poor work practices shall be documented and made available to the Department upon request. The consultant has the same function as the asbestos project manager but is not a full time employee of the building owner.

- 1.25 Contractor - Any individual partnership, corporation or other business concern that performs asbestos abatement for a building owner but that is not a permanent employee of the building owner.
- 1.26 Decontamination enclosure system - A series of connected rooms, separated from the work area and from each other by air locks, for the decontamination of workers, materials and equipment.
- 1.27 Demolition - The wrecking or taking out of any load-supporting structural member of a facility together with any related handling operations.
- 1.28 Department - The South Carolina Department of Health and Environmental Control, 2600 Bull Street, Columbia, SC 29201.
- 1.29 Emergency asbestos project - any asbestos abatement project which was not planned but results from a sudden, unexpected event. This includes operations required by non-routine failures of equipment.
- 1.30 Encapsulation - The application of an encapsulant to asbestos containing materials to control the release of asbestos fibers into the air. The encapsulant creates a membrane over the surface (bridging encapsulant) or penetrates the material and binds its components together (penetrating encapsulant).
- 1.31 EPA - Environmental Protection Agency, 401 M Street, S.W., Washington, DC 20460.
- 1.32 Equipment decontamination enclosure - That portion of a decontamination enclosure system designed for the controlled transfer of materials and equipment, consisting of a washroom and a holding area.
- 1.33 Equipment room - A contaminated area or room which is part of the worker decontamination enclosure system with provisions for the storage of contaminated clothing and equipment.
- 1.34 Facility - Any institutional, commercial or industrial structure, installation or building.
- 1.35 Friable materials - Any material applied on the ceilings, walls, structural members, pipe ductwork, or any other part of a building structure which, when dry, may be crumbled, pulverized, or reduced to powder by hand pressure.

- .36 Glovebag technique - A method with limited applications for removing small amounts of ACM from HVAC ducts, short piping runs, valves, joints, elbows and other non-planar surfaces in a non contained work area. The glovebag assembly is a manufactured device consisting of a glovebag (constructed of 6-mil transparent plastic), two inward projecting long sleeve rubber gloves, one inward projecting waterward sleeve, an internal tool punch and an attached, labeled receptacle for asbestos waste. The glovebag is constructed and installed in such a manner that it surrounds the object or area to be decontaminated and contains all asbestos fibers released during the removal process. All workers who are permitted to use the glovebag technique must be highly trained, experienced and skilled in this method.
- 1.37 HVAC - Heating, ventilation and air conditioning system.
- 1.38 HEPA filtration - High efficiency particulate air filtration found in respirators and vacuum systems capable of filtering 0.3 micron particles with 99.97% efficiency, for use in asbestos contaminated environments.
- 1.39 Holding area - a chamber in the equipment decontamination enclosure located in the washroom and an uncontaminated area.
- 1.40 Homogeneous work area - a site within the abatement work area which contains one type of ACM and where one type of abatement is used.
- 1.41 License - The permit issued by the Department to allow an Asbestos Abatement Entity engage in asbestos projects. =
- 1.42 Minor project - a project in which 25 or less square feet or 10 or less linear feet of friable asbestos material are removed.
- 1.43 Negative air pressure equipment - A portable local exhaust system equipped with HEPA filtration. The system shall be capable of maintaining a constant, low velocity air flow into contaminated areas from adjacent uncontaminated areas, creating a negative pressure differential between the outside and inside of the work area.
- 1.44 NESHAP - The National Emission Standards for Hazardous Air Pollutants (40 CFR 61 Subpart M).
- 1.45 NESHAP project - An asbestos project subject to Neshap, in which at least 160 square feet or 260 linear feet are removed. If projects occur at different sites under one contract (different school sites, for example) then each site shall be considered a separate project. If several projects covered under one contract are smaller than 160 square or 260 linear feet individually but add up to that amount then the combination of the small projects shall be considered one NESHAP project.
- 1.46 NIOSH - The National Institute for Occupational Safety and Health, CDC - NIOSH, Building J N.E., Room 3007, Atlanta GA 30333.
- 1.47 OSHA - The Occupational Safety and Health Administration, 200 Constitution Ave, Washington, DC 20210.
- 1.48 OSHA asbestos standard - 29 CFR 1910.1001.

- .49 Outside air - The air outside buildings and structures.
- .50 Personal air monitoring - A method used to determine employees' exposure to airborne fibers. The sample is collected outside the respirator in the workers' breathing zone. This form of sampling is required by the OSHA asbestos standard.
- .51 Planned asbestos project - an asbestos project or a number of such projects in which the amount of asbestos containing material to be removed, stripped or otherwise disturbed within a given period of time can be predicted. Individual, non-scheduled abatements are included if a number of such operations can be predicted to occur during a given period of time based on operating experiences.
- 1.52 Plasticize - To cover floors and walls with plastic sheeting or by using spray plastics which may be authorized by the Department on a case by case basis.
- 1.53 Removal - The stripping of any asbestos containing materials from surfaces or components of a facility.
- 1.54 Renovation - Altering in any way one or more facility components. Operations in which load-supporting structural members are wrecked or taken out are excluded.
- ..55 Repair - The restoration of asbestos containing insulation that has been damaged, usually located on pipes, boilers, tanks, turbines, ducts or other facility components. Repair usually consists of the application of duct tape, rewettable glass cloth, canvas, cement or other suitable material to seal exposed areas where asbestos fibers may be released. Repair of previously encapsulated asbestos containing materials may involve filling damaged areas with non-asbestos substitutes and re-encapsulating. Repair of enclosures around asbestos containing materials is also included in this category of abatement.
- 1.56 Shower Room - A room between the clean room and the equipment room in the worker decontamination enclosure with hot and cold or warm running water controllable at the tap and suitably arranged for complete showering during decontamination.
- 1.57 Small project - A project in which more than 25 and less than 160 square feet or more than and less than 260 linear feet of friable asbestos material is removed.
- 1.58 Staging area - The area near the waste transfer airlock where containerized asbestos waste has been placed prior to removal from the work area.
- 1.59 Strip - To remove friable asbestos from any part of a facility.
- 1.60 Structural component - Any pipe, duct, boiler, tank, reactor, turbine or furnace at or in a facility or any structural member of a facility.
- 1.61 Structural member - Any load-supporting member of a facility, such as beams and load-supporting walls or any non-load-supporting member, such as ceilings and non-load-supporting walls.
- 1.62 Structure - A whole facility, building or a major portion thereof, such

as a building wing.

- .63 Surfactant - A chemical wetting agent added to water to improve penetration.
- .63 Supervisor - The contractor or the person designated as the contractor's representative and responsible for the onsite supervision of the removal or encapsulation of friable ACM.
- .64 Trip ticket - A dump receipt, transportation manifest or other documentation of disposal at a landfill approved by the Department.
- .65 Washroom - A room between the work area and the holding area in the equipment decontamination enclosure system where equipment and waste containers are wet cleaned and/or HEPA vacuumed prior to disposal.
- 1.66 Wet cleaning - The process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops or other cleaning tools which have been dampened with water. These tools shall be disposed of as asbestos contaminated waste upon completion of the project.
- 1.66 Work area - Designated rooms, spaces or areas of the project in which asbestos abatement actions are to be undertaken or which may be contaminated as a result of such abatement actions.
- 1.67 Worker decontamination enclosure system - That portion of a decontamination enclosure system designed for controlled passage of workers and other personnel and authorized visitors. It consists of a clean room, a shower room and an equipment room separated from each other and from the work area by airlocks and curtained doorways.
- 2.0 General Licensing Requirements - No Asbestos Abatement Entity, consultant or air sampling professional shall engage in any asbestos project unless it is licensed to do so by the Department under this Chapter.
- 3.0 Applicability
 - 3.1 The licensing requirements of this Chapter apply to any Asbestos Abatement Entity, consultant, building owner's representative, air sampling professional, supervisor or worker involved in the removal, encapsulation, enclosure, renovation, repair, demolition, or other disturbance of friable asbestos or friable asbestos containing materials.
 - 3.2 The licensing requirements of this chapter shall apply to Asbestos Abatement Entities, consultants, building owner's representatives; air sampling professionals, supervisors or workers engaged in any amount of asbestos abatement work of any type. There are no asbestos project size limits below which the applicable requirements of this Chapter shall not apply, unless otherwise specified.
 - 3.2.1 Owners of private residences of four units or less are exempt from the requirements of this Chapter. Contractors and consultants shall comply with the requirements specified within this Chapter

during asbestos abatement projects in private residences.

3.3 Determination of Applicability

3.3.1 An Asbestos Abatement Entity may request that the Department determine whether a project is an asbestos project subject to the requirements of this Chapter. The Department shall make the determination in writing, not later than 5 days after it has received a written request describing the asbestos containing materials (including laboratory data sheets with bulk sample results, methods of analysis, and the signature of the analyst), the proposed project, and the Asbestos Abatement Entity.

3.3.2 An erroneous determination by the Department that a project is not subject to the requirements of this Chapter only relieves the Asbestos Abatement Entity from those requirements to the extent that [the regulatory agency] was provided with the appropriate information to make a correct determination.

4.0 Worker Protection Requirements

4.1 Training

4.1.1 Training shall be provided by the Asbestos Abatement Entity to all employees or agents who may be required to disturb asbestos containing materials for abatement and auxiliary purposes and to all supervisory personnel who may be involved in the planning, execution or inspection of asbestos projects.

4.1.2 The Asbestos Abatement Entity shall insure that personnel identified in 4.1.1 are provided with:

4.1.2.1 An initial training course.

4.1.2.2 A yearly review course.

4.1.3 The initial training course shall provide, at a minimum, information on the following topics:

4.1.3.1 The physical characteristics of asbestos including fiber size, aerodynamic characteristics and physical appearance.

4.1.3.2 The health hazards of asbestos including the nature of asbestos related diseases, routes of exposure, dose-response relationships, synergism between cigarette smoking and asbestos exposure, latency period for disease and health basis for standards.

4.1.3.3 Employee personal protective equipment including the classes and characteristics of respirator types, limitations of respirators, proper selection, inspection, donning, use, maintenance and storage procedures, methods for field testing of the facepiece-to-face seal (positive and negative pressure fitting tests), qualitative and quantitative fit testing procedures, variability between field and laboratory protection factors, factors that alter respirator fit (e.g., facial hair), the components of a proper respiratory protection program, selection and use of personal pro-

protective clothing, use, storage and handling of launderable clothing, non-slip footwear, gloves, eye-protection and hard hats.

4.1.3.4 Medical monitoring procedures and requirements included under OSHA 29 CFR 1910.1001 and 29 CFR 1910.134, additional recommended procedures and tests, benefits of medical monitoring and employee access to records.

4.1.3.5 Air monitoring procedures and requirements included under OSHA 29 CFR 1910.1001 including a description of equipment and methods, reasons for air monitoring, types of samples and current standards with proposed changes.

4.1.3.6 State-of-the-art work practices for asbestos abatement activities including purpose, proper construction and maintenance of barriers and decontamination enclosure systems, posting of warning signs, electrical and ventilation system lock-out, proper working techniques for minimizing fiber release, use of wet methods and surfactants, use of negative pressure ventilation equipment, use of HEPA vacuums and proper clean-up and disposal procedures. Work practice requirements as they apply to removal encapsulation, enclosure and repair shall be discussed individually.

4.1.3.7 Personal hygiene including entry and exit procedures for the work area, use of showers and prohibition of eating, drinking, smoking and chewing (gum or tobacco) in the work area.

4.1.3.8 Additional safety hazards that may be encountered during abatement activities and how to deal with them including electrical hazards, heat stress, air contaminants other than asbestos, fire and explosion hazards, scaffold and ladder hazards, slips, trips and falls, confined spaces and noise.

4.1.3.9 The requirements, procedures and standards established by:

- 4.1.3.9.1 EPA 40 CFR Part 61, Subparts A and M
- 4.1.3.9.2 OSHA 29 CFR 1910.1001 and 29 CFR 1910.134
- 4.1.3.9.3 SC Regulation No. 61-86.1

4.1.3.10 Contractors, supervisors, consultants and building owner's representatives shall receive additional instruction as a requirement for certification and licensing. This instruction shall consist of attendance of the course "Interim Procedures and Practices for Asbestos Removal Projects". This course is currently offered at the Georgia Institute of Technology, Tufts University and the University of Kansas and is approved by the EPA. In the future as new courses are developed by EPA they may be accepted as equivalent to the specified training at the discretion of the Department.

4.3.11 Contractors, supervisors, consultants and building owner's representatives who have attended and received a satisfactory score at the course "Supervision of Asbestos Abatement Contracts" within six months of the date of promulgation of this Chapter shall be issued temporary licences until such time as they may attend and receive a satisfactory score at the specified course upon payment of the required fees. In no case shall the temporary certification extend beyond six

months of the effective date of this Chapter. Proof of a satisfactory score must be provided to the Department to receive a temporary license.

4.1.4 The yearly review course shall at a minimum, adequately review the topics in 4.1.3, update information on state-of-the-art procedures and equipment and review regulatory changes and interpretations. Specific topic coverage may be requested by the Department.

4.1.5 Personnel shall be required to pass in a manner satisfactory to [the regulatory agency] an examination in written or other acceptable form in order to demonstrate familiarity with those issues relevant to the safe performance of asbestos abatement activities. The achievement of a minimum score on a written examination shall be required.

4.2 Respiratory Protection

4.2.1 An Asbestos Abatement Entity shall, before it engages in any asbestos project, prepare and submit to the Department a written respiratory protection program in accordance with the requirements of OSHA 29 CFR 1910.134 (b) and 29 CFR 1910.1001 (OSHA Asbestos Standard). This program shall be provided to employees and posted at all projects requiring abatement activities over more than a single day.

4.2.2 Selection

4.2.2.1 All respiratory protection shall be provided to workers in conjunction with a written respiratory protection program which shall meet the requirements of OSHA Regulation 29 CFR 1910.134(b)(1-11). This program shall be posted at the work site.

4.2.2.2 Workers shall be provided with personally issued and marked respiratory equipment approved by NIOSH.

4.2.2.3 Respiratory protection shall be worn by all persons potentially exposed to asbestos from the initiation of the asbestos abatement project until all areas have been given clearance. Clearance shall be obtained by visual inspection and air monitoring.

4.2.2.4 Type "C" air supplied respirators in positive pressure or pressure demand mode with full facepieces and HEPA filtered disconnect protection shall be used for all abatement work of more than one hour duration per day until the successful completion of final clearance air monitoring. Powered air purifying respirators equipped with HEPA filters and full facepieces or respirators with higher NIOSH assigned protection factors may be used for inspection or repair work of less than one hour duration per day. A supply of charged replacement batteries and filters and a flow test meter shall be available in the clean change area for use with powered air purifying respirators. Air purifying respirators with dual high-efficiency (HEPA) filters may be utilized during work area preparation activities. Spectacle kits and eyeglasses shall be provided for employees who wear glasses and who must wear full facepieces respirators. Respirators shall be provided that have been tested and approved by NIOSH for use in asbestos contaminated

atmospheres

- 4.2.2.5 Compressed air systems shall be designed to provide air volumes and pressures to accommodate respirator manufacturer's specifications. The compressed air systems shall have a receiver of such capacity to allow escape for all respirator wearers from contaminated areas in the event of compressor failure. Compressors shall meet the requirements of 29 CFR 1910.134.(d). Compressors shall have an inline carbon monoxide monitor, and daily inspection of the carbon monoxide monitor shall be documented. Documentation of the compressed air system/respiratory protection system shall be retained on site and shall include a list of compatible components with the maximum number and type of respirators that may be used with the system. Daily testing of compressed air shall be conducted to ensure that systems provide breathing air of Grade D quality as described in the Compressed Air Gas Association Commodity Specification G-7.1. The air compressor shall be located where contaminated air cannot enter the system.
- 4.2.2.6 The minimum type of respiratory protection to be used in areas other than the work area shall be the powered air purifying respirator with HEPA filtration.
- 4.2.2.7 Single-use disposable respirators shall not be permitted for use during any asbestos abatement activities.
- 4.2.2.8 Negative-pressure, dual-cartridge respirators shall be equipped with high efficiency filters and exhalation and inhalation valves to permit the performance of positive and negative pressure fit checks.
- 4.2.3 Fitting (Note: This activity may be best performed during the training course)
 - 4.2.3.1 Each employee shall be given an opportunity to try on a variety of respirator styles and sizes and to select a respirator for comfortable fit.
 - 4.2.3.2 Each employee shall be instructed in the performance of positive and negative pressure fit checks and be able to successfully perform them if respirator design permits.
 - 4.2.3.3 Each employee shall be fit tested using generally acceptable quantitative fit testing methods or by qualitative fit testing procedures as detailed in the OSHA Lead Standard, 29 CFR 1910.1025 Appendix D Qualitative Fit Test Protocols, and adequately pass the selected fit test procedure.
 - 4.2.3.4 Employees shall be provided with the brand name and model number of respirators that they have been fitted for and trained to use. This information shall be included on the employee training identification card.
- 4.2.4 No employee or agent shall be permitted in the work area without the respiratory protection required for the level of exposure in the workplace. This requirement shall be strictly enforced by the Asbestos

Abatement Entity.

- 4.2.5 No personnel with beards, long sideburns or other physical characteristics which interfere with respirator facepiece-to-face seal shall be permitted in the work area.
- 4.2.6 Respirator fit testing shall be conducted by an industrial hygienist or other individual equally qualified by virtue of training and experience, capable of performing and interpreting the results of the fit testing procedures.
- 4.2.7 Respirators shall be cleaned after each use and hung or stored up off the floor. No visible residues shall be permitted on the inner surfaces of respirators.

4.3 Protective Clothing

- 4.3.1 Each employee shall be provided with full body disposable protective clothing impermeable to asbestos fibers (TyvekR or equivalent). Clothing shall consist of head and full body protection and be properly sized to reduce tearing during body movements. Suits shall be sealed at wrists and neck to prevent body contamination.
- 4.3.2 Disposable or washable non-slip footwear shall be provided to all workers. This shall remain in the equipment room during exiting procedures until the completion of the abatement, then either decontaminated or disposed of as asbestos waste. Legs of disposable clothing shall be sealed to the top of this footwear to prevent body contamination.
- 4.3.3 Gloves, hard hats and safety eyewear shall be available to employees for use as needed.

4.4 Medical Monitoring

- 4.4.1 Asbestos abatement entities must insure that any employee or agent who may be exposed to airborne asbestos is medically monitored in accordance with the requirements of OSHA 29 CFR 1910.1001 (j), prior to engaging in any asbestos abatement activity. Monitoring shall include, at a minimum:
 - 4.4.1.1 A work/medical history to elicit symptomatology of respiratory disease.
 - 4.4.1.2 A chest x-ray (posterior-anterior and lateral views, 14 x 13 inches.
 - 4.4.1.3 A pulmonary function test including forced vital capacity (FVC), forced expiratory volume at one second (FEV1) and FEV/FVC interpretation and comparison with standardized normals.
- 4.4.2 Employees must also be given an opportunity to be evaluated by a physician to determine their capability to safely work while breathing through the added resistance of a respirator. (Examining physicians should be made aware of the nature of respiratory protective hazards, and knowledgeable about the specific types of respirators the employee

shall be required to wear and the work he will be required to perform. They should also be advised as to special hazards that may exist in the work place (e.g. high temperatures, toxic contaminants).

4.4.3 Chest x-rays shall be taken by a Certified Radiology Technician and interpreted by a Certified B-Reader.

4.4.4 Pulmonary function testing shall be conducted by a NIOSH Certified Pulmonary Technician.

4.4.4.1 There is a school of thought among some physicians that the yearly X-rays and other requirements of 29 CFR 1910.1001 for medical monitoring are not reasonable for workers with infrequent or routinely low exposures to asbestos. A suggested alternative protocol for medical monitoring of asbestos workers whose exposure level falls below the OSHA Action Standard, and who are not legally required to follow the Standard is provided below:
Protocol for follow-up examinations may be conducted as determined by the degree of risk as follows:

Group 1 (Minimal risk)

Under age 45

Less than 15 years work with asbestos

No sign of lung disease

Complete exam every 5 years (as per Section 4.4.1)

Group 2 (one risk factor)

Greater than 45 years of age

Return in two years for reexamination

Chest x-rays at the discretion of the physician

Group 3 (one of the following 3:)

Smoker and age 45 or older or

Greater than 15 years work with asbestos or

Any worker with signs of chronic lung disease, even in the absence of other risk factors.

Return in one year for re-examination

Chest X-rays at the discretion of the physician

4.5 Air Monitoring

4.5.1 The Asbestos Abatement Entity must provide representative air monitoring for employees during asbestos abatement activities.

4.5.2 Air monitoring shall be provided in accordance with OSHA 29 CFR 1910.1001 (f).

4.5.3 Clearance air monitoring

4.5.3.1 Following the completion of clean-up operations, the contractor shall notify the asbestos project manager or consultant that work areas are ready for clearance air monitoring.

4.5.3.2 The asbestos project manager or consultant shall then arrange for the air sampling professional to sample the air in the work area and adjacent areas for airborne fiber concentrations.

4.5.3.3 Sampling shall not begin until at least 24 hours after wet cleaning has been completed and no visible pools of water or condensation remain.

- 4.5.3.4 The HEPA filtered negative air pressure equipment shall be in operation in the area during clearance monitoring.
- 4.5.3.5 The air sampling shall be conducted using collection media and procedures in accordance with NIOSH Method 7400 or Electron Microscope of Airborne Asbestos Concentrations, USEPA Report 600/2-77-178 (1978) and USEPA Contract No. 68-02-3266 (1984). Air volumes shall provide statistically reliable results for a concentration of 0.01 fibers per cubic centimeter of air (f/cc) or lower as determined by phase contrast microscopy or an asbestos fiber concentration of less than or equal to the outside air as determined by transmission electron microscopy. The sampling zone shall be representative of the building occupant's breathing zone.
- 4.5.3.6 The air sampling professional shall follow the procedures located in Appendix B when conducting clearance air monitoring.
- 4.5.3.7 At least one representative sample shall be taken for every 10,000 square feet of floor space where homogeneous ACM have been removed or abated, with a minimum of five samples. Where the 10,000 square foot area includes several rooms, at least one sample shall be located in the room where the ACM was in the worst condition before the project began.
- 4.5.3.8 Aggressive sampling techniques shall be used during all clearance air monitoring as described in Appendix B.
- 4.5.3.9 Air samples shall be analyzed by phase contrast microscopy (PCM) using procedures in accordance with NIOSH Standard Analytical Method P&CAM 239 or Niosh Method 7400 or by transmission electron microscopy (TEM) using procedures in accordance with Electron Microscope Measurement of Airborne Asbestos Concentrations, USEPA Report 600/2-77-178 (1978) and USEPA Contract No. 68-02-3266 (1984).
- 4.5.3.10 When using TEM for clearance air monitoring the following sampling procedures, analysis methods and release criteria shall be followed:
- 4.5.3.10.1 Air sampling:
- A) Draw at least 3000 liters of air through each filter at a rate of 2 to 12 liters per minute.
 - B) Collect at least five samples from each homogeneous
 - C) At the same time collect at least five samples just outside the work area but within the building. These samples shall be compared with those collected inside the work area to ensure that the work area is at least as clean as the incoming air (refer to Appendix A).
- 4.5.3.10.2 Analysis:
- A) Measure the asbestos on each filter with TEM using the EPA procedures (USEPA Report No. 600/2-77-178 (1978) and USEPA Contract No. 68-02-3266 (1984))
 - B) Use a direct transfer method of sample preparation.
 - C) Express the results as f/cc.
 - D) Include at least one field blank and one laboratory blank per abatement job for quality control purposes. Also, split one work area sample and conduct duplicate analyses.
- 4.5.3.10.3 Release criteria:

- A) If average fiber concentration of the work area samples is not statistically larger than the average of the outside samples, the abatement project is complete, and the contractor shall be released from the project. Each homogeneous area shall pass the test before the contractor is released. Appendix B contains information to determine statistical differences.
- B) If the average of the work area samples is statistically larger than the average of the outside samples, clean the entire workarea again and repeat the test. (collect new work area samples and follow the procedures described above.

4.5.3.11 When using PCM for clearance air monitoring the following sampling procedures, analysis methods, and release criteria shall be followed:

4.5.3.11.1 Air sampling:

- A) Draw at least 3000 liters of air through each filter at a rate of 2 to 12 liters per minute.
- B) Collect at least five samples per homogeneous work area, or one per room, whichever is greater.

4.5.3.11.2 Analysis:

- A) Measure the asbestos on each filter with PCM using the NIOSH P&CAM 239 or NIOSH 7400 procedures.
- B) Include at least one field blank and one laboratory blank per abatement project for quality control purposes. Also, split one work area sample for duplicate analysis.

4.5.3.11.3 Release criteria:

- A) Release contractor from the abatement project if every sample value is below 0.01 f/cc.
- B) If any of the sample values is above 0.01 f/cc, clean the entire work area again, collect new samples, and evaluate the samples as described above.

4.5.3.12 The air sampling professional shall interpret the results of clearance air monitoring using the methods described in Appendix B

4.5.3.13 The air sampling professional shall report the clearance air monitoring results in writing to the asbestos project manager or consultant as applicable.

4.5.3.14 Areas exceeding 0.01 f/cc as determined by PCM or the outside air as determined by TEM shall be recleaned by the contractor using wet methods and providing a negative pressure HEPA filtered exhaust system during the recleaning process. This process of recleaning, allowing surfaces to dry and retesting, shall be repeated until the clearance standard is achieved.

4.5.4 Air sampling schedule.

4.5.4.1 the air sampling professional shall conduct all air sampling for the building owner.

4.5.4.2 The air sampling professional shall conduct air sampling in accordance with the NIOSH Standard Analytical Method for Asbestos in Air P&CAM 239 or Method 7400.

4.5.4.3 The following schedule shall be utilized for air sampling during the project in addition to OSHA compliance monitoring:

4.5.4.3.1 Background air sampling - A sufficient number of air samples shall be collected prior to the start of the abatement activities in order to determine background airborne concentrations. Samples should be taken both inside and outside the work area and buildings to establish existing levels under normal activity conditions.

4.5.4.3.2 Daily sampling - Once abatement activities begin the following schedule shall be required on a daily basis. The size of the project will have impact on the samples necessary to monitor removal activities. Decisions on the number of samples should be made with the advice of the air sampling professional. The following are required minimums:

- A) 2 area samples inside the work area including worker and equipment decontamination enclosure systems.
- B) 2 personal samples inside the work area
- C) 2 area samples outside the work area in uncontaminated areas of the building including one at the entrance to the worker decontamination enclosure.
- D) 1 area sample outside the building.
- E) 1 area sample at the exhaust of negative pressure ventilation equipment.

6 the Department may, on a case-by-case basis, approve an alternative to a worker protection requirements in 4.1 - 4.4 for an asbestos project provided that the Asbestos Abatement Entity submits the alternative procedure to the Department in writing and demonstrates to the satisfaction of the Department that the proposed alternative procedure provides equivalent worker protection.

5.0 Work Practice Requirements

5.1 Work practices for NESHAP Sources - Any Asbestos Abatement Entity that engages in any asbestos project that involves greater than 250 linear feet (80 meters) of pipe covered or coated with asbestos containing material or 160 square feet (15 square meters) of asbestos containing material used to cover or coat any duct, boiler, tank, reactor, turbine, structure, structural member or structural component shall comply with the following work practice requirements:

5.1.1 General (Removal, Encapsulation and Enclosure)

5.1.1.1 Barriers to isolate contaminated from uncontaminated areas shall be constructed of polyethylene sheeting attached securely in place

5.1.1.1.1 Remove all movable objects from the work area. Cleaning of contaminated items shall be performed if necessary and feasible. Detach and wet clean removeable electrical, heating and ventilating equipment and other items which may be connected to the asbestos surfaces. Cover all non-movable objects in the work area with 4-mil polyethylene sheeting secured into place. Seal all openings between the work area and uncontaminated areas including

windows, doorways, elevator openings, corridor entrances, drains, ducts, grills, grates, diffusers and skylights.

- 5.1.1.1.2 Floor sheeting shall consist of 2 layers of 6-mil polyethylene sheeting. Floor sheeting shall extend up sidewalls at least 12" and be sized to minimize seams. No seams shall be located at wall/floor joints.
 - 5.1.1.1.3 Wall sheeting shall consist of 2 layers of 4-mil polyethylene sheeting. It shall be installed to minimize joints and shall extend beyond wall/floor joint at least 12". No seams shall be located at wall/wall joints.
 - 5.1.1.1.4 A worker decontamination enclosure system consisting of a clean room, shower room and equipment room, each separated from each other and from the work area by airlocks and accessible through doorways protected with two overlapping polyethylene sheets shall be provided (a schematic diagram of a typical decontamination system is illustrated in Appendix A).
 - 5.1.1.1.5 The shower room shall be constructed in such a manner as to prevent asbestos track-out after worker showering.
 - 5.1.1.1.6 Each shower head shall be equipped with hot and cold water adjustable at the tap.
 - 5.1.1.1.7 Contaminated water from the shower room shall be either drummed or drained to the sanitary sewer system. Filtering of the water prior to disposal shall be required. No contaminated water shall be allowed to leak or drain outside of the work area except into sewers. Contaminated water that has been filtered shall not drain or leak outside of the work area.
 - 5.1.1.1.8 Material from within the work area shall not be permitted outside of the work area except in sealed leak-tight containers. Equipment that is to be reused shall be thoroughly decontaminated so that no visible residue remains prior to removal from the work area. If it is not thoroughly decontaminated it shall be sealed in leaktight containers so that no visible residue appears on the outside surfaces.
 - 5.1.1.1.9 If the asbestos abatement entity contaminates with visible ACM the carpeting shall be considered contaminated, disposed of as contaminated waste and replaced at the asbestos abatement entity's expense.
 - 5.1.1.1.10 If the asbestos abatement entity contaminates the HVAC system by turning it on during the project the asbestos abatement entity shall either disassemble and wet clean the entire HVAC system where contamination could possibly have spread, or replace the contaminated portions of the system at the discretion of the consultant or asbestos project manager.
- 5.1.1.2 Shut down and lock out all HVAC equipment in or passing through the work area. Seal all intake and exhaust openings and any seams in system components with 6-mil polyethylene sheeting and/or tape. Replace all system filters at the completion of the abatement and dispose of old filters as asbestos waste. Decontaminate ventilation system ductwork interiors wherever necessary.
- 5.1.1.3 Caution signs in accordance with OSHA 29 CFR 1910.1001 (g) shall be displayed at all approaches to any location where airborne fiber levels can be expected to exceed background levels.

5.1.1.4 Following abatement, clean-up procedures using HEPA vacuuming and wet cleaning techniques shall be performed. Wet cleaning, using an amended water solution shall be performed, followed by HEPA vacuuming after surfaces have been allowed to dry. The sequence of wet cleaning and vacuuming shall be repeated at 24-hour intervals until no visible residue is observed in the work area.

5.1.1.5 Negative pressure ventilation units with HEPA filtration and in sufficient number to provide one workplace air change every 15 minutes shall be operated continuously for the duration of the project. (The duration of the abatement project for this requirement shall be considered from the time barrier construction is completed through the time acceptable final clearance air-monitoring results are obtained). These units shall exhaust filtered air to the outside of the building wherever feasible. If exhausted to uncontaminated (and unoccupied) interior spaces, a direct reading instrument equipped with a chart recorder shall be located at the exhaust to continuously monitor fiber release.) Procedures for operation as detailed in EPA document No. EPA 560/5-83-002 Guidance For Controlling Friable Asbestos-Containing Materials In Buildings Appendix F shall be utilized.

5.1.1.6 All asbestos containing waste shall be thoroughly wetted with an amended water solution before being placed into containers for disposal.

5.1.1.7 Asbestos waste shall be placed in impermeable containers for transport to the landfill. Metal or fiber drums with locking-ring tops shall be used when asbestos waste contains sharp edged components. Double polyethylene bags of at least 6-mil thickness and which can be securely sealed may be used for waste. Large components or structural members may be removed intact and wrapped in two layers of 6-mil polyethylene sheeting secured with tape for disposal.

5.1.1.8 All containers (bags, drums, wrapped components) shall be labeled so that labels have the appearance of or are constructed in accordance with OSHA 29 CFR 1910.1001 (g) or EPA 40 CFR 61.152.

5.1.1.9 Transport and disposal of asbestos waste shall occur in a manner that will not permit the release of asbestos fibers into the air.

5.1.1.10 Disposal shall occur at a location approved for handling asbestos waste by the Department.

5.1.1.11 The asbestos abatement entity shall obtain trip tickets at the landfill to document disposal of all of the ACM. A record keeping form utilizing a chain-of-custody format shall include the names of the building owner, contractor, disposal site, the estimated quantity of the asbestos containing waste and the type and number of containers used. The form shall be signed by the building owner or his representative, the contractor and the disposal site operator as the material changes custody. If a separate hauler is used his name, address, telephone number and signature shall also appear on the form.

5.1.1.12 When the Asbestos abatement entity utilizes a rental vehicle to transport asbestos waste to a landfill he shall provide the vehicles owner with a written statement as to the intended use of the vehicle. A copy of this statement signed by the vehicle owner shall be provided to the Department upon completion of the project.

5.1.1.13 Submit copies of all air sampling results for clearance air monitoring and all disposal receipts to the Building Owner and the Department.

5.1.2 Removal

5.1.2.1 All asbestos containing material shall be thoroughly wetted through to the substrate using an amended water solution prior to removal.

5.1.2.2 Components shall be removed intact or in large sections whenever possible and carefully lowered to the floor.

5.1.2.3 Asbestos containing material shall be removed in small sections and containerized while wet. At no time shall material be allowed to accumulate or become dry. Structural components shall be thoroughly wetted prior to wrapping in polyethylene sheeting for disposal.

5.1.2.4 Material shall not be dropped or thrown to the floor level. For materials located at heights greater than 50 feet above the floor, a dust-tight, enclosed chute shall be constructed to transport removed material to containers on the floor. Asbestos containing material may be dropped to a raised scaffold or containerized at elevated levels for disposal. Materials greater than 15 feet above the floor shall be dropped onto inclined chutes or scaffolding or containerized at elevated levels for eventual disposal.

5.1.2.5 For porous surfaces that have been stripped of asbestos containing materials, a coating of encapsulating agent shall be applied to securely seal any residual fibers that may be present. The encapsulating agent should be chosen so as to be compatible with subsequent coverings.

5.1.3 Encapsulation

5.1.3.1 Remove loose and hanging asbestos containing material in accordance with requirements of Section 5.1.2.

5.1.3.2 Filler material applied to gaps in existing material shall contain no asbestos, adhere well to the substrate and provide an adequate base for the encapsulating agent.

5.1.3.3 Encapsulants shall be applied using only airless spray equipment with nozzle pressure adjustable between 400 and 1500 psi (nozzle pressure and tip size will vary, based on manufacturer's recommendations for various encapsulants.)

5.1.3.4 Encapsulated materials shall be specially designated by signs,

labels, color coding or some other mechanism to warn individuals who may be required to disturb the material.

5.1.3.5 Encapsulants shall not be solvent-based or utilize a vehicle consisting of hydrocarbons.

5.1.4 Enclosure

5.1.4.1 Spray all areas of asbestos containing materials with amended water if they are to be disturbed during the installation of hangers, brackets or other portions of the enclosure.

5.1.4.2 Remove loose and hanging asbestos containing material in accordance with requirements of Section 5.1.2.

5.1.4.3 Use non-asbestos containing substitutes to patch thermal insulation and fireproofing materials when required where appropriate.

5.1.4.4 Enclosures for asbestos-containing materials shall be specially designated by signs, labels, color coding or some other mechanism to warn individuals who may be required to enter or disturb the enclosure. (Note: Acceptable enclosures are normally air-tight and of permanent construction, with the area behind them being inaccessible.)

5.1.5 Demolition

5.1.5.1 Any demolition of a structure or portion of a structure which contains structural members or components composed of or covered by asbestos containing material shall be preceded by a removal of all such materials prior to demolition, according to the requirements of sections 5.1.1 and 5.1.2..

5.1.5.2 In lieu of the requirements specified in 5.1.1.1.1, 5.1.1.1.2, 5.1.1.1.3, 5.1.1.2, and 5.1.2.5, asbestos abatement entities engaging in demolition activities shall comply with the following:

5.1.5.2.1 Before beginning a demolition project seal off all doors, windows, floor drains, vents and other openings to the outside of the building and to areas within the building that do not contain asbestos materials, with 6-mil polyethylene sheeting and waterproof tape or equivalent acceptable to the Department

5.1.5.2.2 If a structure is to be partially demolished, HVAC equipment in the demolition area or passing through it but servicing areas of the building which will remain, shall be shut down and locked out and thoroughly sealed with 6-mil polyethylene sheeting and waterproof tape.

5.1.5.3 No clearance air sampling is required following abatement activities conducted for demolition purposes unless the area is to be utilized by unprotected personnel prior to demolition.

5.1.5.4 All other requirements of Sections 5.1.1 and 5.1.2, unless specifically deleted in 5.1.5.2, shall apply to demolition

abatement activities.

5.2 Work Practices for small projects

5.2.1 An Asbestos Abatement Entity engaged in an asbestos project not subject to the requirements of Section 5.1 shall take reasonable precautions to prevent the release of asbestos fibers to the environment. Precautions shall include but are not limited to:

5.2.1.1 Construction of adequate barriers to contain asbestos fibers release within the work area.

5.2.1.2 Wetting of all asbestos containing materials prior to removal. Keeping them wet until containerized.

5.2.1.3 Use of HEPA vacuum equipment and wet cleaning techniques to clean-up the work area following abatement until there is no visible residue.

5.2.1.4 Containerizing waste in appropriately labeled impermeable containers (polyethylene sheeting, bags and/or fiber or metal drums)

5.2.1.5 Transportation to and disposal at an approved facility in a manner that does not release fibers into the air.

5.3 Work practices for minor projects

5.3.1 Glove bag technique. Glove bags shall be used to remove small amounts small amounts of ACM from pipes, valves, elbows, etc when repairs are necessary. Procedures outlined in the Georgia Institute of Technology document "Glove Bag Technique for Pipe Lagging Removal shall be followed.

5.4 Alternative Procedures - the Department may, on a case-by-case basis, approve an alternative procedure for control of emissions from an asbestos project provided that the Asbestos Abatement Entity submits the alternative procedure to the Department in writing and demonstrates to the satisfaction of the Department that compliance with the prescribed procedures is not practical or not feasible or that the proposed alternative procedures provide equivalent control of asbestos. The Department, following its review, may approve an alternative procedure if it determines that it will minimize the emissions of asbestos.

5.5 The asbestos abatement entity shall transport asbestos materials in accordance with the following procedures.:

5.5.1 Drums, bags and wrapped components that have been removed from the work area shall be loaded into an enclosed truck for transportation.

5.5.2 The enclosed cargo area of the truck shall be free of debris and lined with 6 mil polyethylene sheeting to prevent contamination from leaking or spilled containers. Floor sheeting shall be installed first and extend up the side walls. Wall sheeting shall overlap by six inches and be taped into place.

5.5.3 Drums shall be placed on level surfaces in the cargo area and packed tightly together to prevent shifting and tipping. Large

structural components shall be secured to prevent shifting and bags placed on top. Containers shall not be thrown into the truck cargo area.

5.5.4 Personnel unloading asbestos-containing waste shall be protected by disposable clothing including, body and foot protection and at a minimum, half-facepiece, air-purifying, dual cartridge respirators equipped with high efficiency filters.

5.5.5 any debris or residue observed on containers or surfaces outside of the work area resulting from clean-up or disposal activities shall be immediately cleaned up using HEPA filtered vacuum equipment and/or wet methods.

5.5.6 Large metal dumpsters used for asbestos waste disposal shall have doors or tops that can be closed and locked to prevent vandalism, wind dispersion of asbestos fibers or other disturbance of bagged asbestos debris. Unbagged material and non-asbestos waste shall not be placed in these containers. Bags shall be placed, not thrown, into these containers to avoid splitting.

5.5.7 Asbestos containing materials shall be transported directly to the landfill. Temporary storage at a location other than the abatement project shall not be permitted except on a case by case basis when authorized by the Department.

1.6 The asbestos abatement entity shall dispose of asbestos materials in accordance with the following procedures:

5.6.1 Upon reaching the landfill trucks shall approach the dump location as closely as possible for unloading of the asbestos-containing waste.

5.6.2 Bags, drums and components shall be inspected when unloaded at the disposal site. Material in damaged containers shall be repacked in empty drums or bags.

5.6.3 Waste containers shall be placed on the ground at the disposal site, not pushed or thrown out of trucks.

5.6.4 Personnel unloading containers at the disposal site shall wear protective equipment consisting of disposable head, foot and body protection and, at a minimum, half-facepiece, air-purifying, dual cartridge respirators equipped with high efficiency filters.

5.6.5 Following the removal of all containerized waste the truck cargo area shall be decontaminated using HEPA vacuums and/or wet methods. polyethylene sheeting shall be removed and discarded in bags or drums along with contaminated cleaning materials and protective clothing.

5.6.6 If landfill personnel have not been provided protective equipment by the landfill operator for the burial operation the asbestos abatement entity shall make available protective clothing and respiratory protection for the duration of this operation.

5.6.7 Trip tickets shall be signed by the landfill operator and copies provided to the Department upon completion of the project.

7 Re-establishment of the work area and systems. The asbestos abatement entity shall re-establish the work area in accordance with the following procedures.

5.7.1 Re-establishment of the work area shall only occur following the completion of the cleanup procedures and after the clearance air monitoring has been performed and documented to the satisfaction of the building owner or his representative.

5.7.2 The asbestos abatement entity and the building owner's representative shall visually inspect the work area for any remaining visible residue. Evidence of contamination shall necessitate additional cleaning.

5.7.3 Additional air monitoring shall be performed in accordance with Section 4.5.3 if additional cleanup is necessary.

5.7.4 Following satisfactory clearance of the work area, remaining polyethylene barriers and worker and equipment decontamination enclosure systems shall be removed and disposed of as asbestos contaminated waste. Following removal, the entire area including HVAC filter assembly and duct work shall be wet cleaned or HEPA vacuumed to remove residual asbestos fibers. At the discretion of the asbestos abatement entity, mandatory requirements for personal protective equipment may be waived following the removal of all polyethylene barriers.

5.7.5 Mounted objects removed from former positions during area preparation activities may be re-secured.

5.7.6 Objects that were moved to temporary locations may be relocated to original positions.

5.7.7 New filters shall be installed in HVAC systems and mechanical and electrical systems shall be re-established in working order.

6.0 License Application

6.1 To apply for or to renew a license, an Asbestos Abatement Entity shall:

6.1.1 Submit a completed application to the Department on forms provided by the Department and

6.1.2 Pay the fee as indicated below, by certified check made payable to the South Carolina Department of Health & Environmental Control.

6.2 License Fee

6.2.1 Asbestos abatement entity fee (contractor or building owner, if work is performed in-house)

Number of Employees to be Engaged in Asbestos Projects:	License Fee:
2 or less	\$ 50
3 to 5	\$200
6 to 15	\$300
16 or more	\$750

6.2.2 Supervisor licence fee: \$50

6.2.3 Worker licence fee: \$25

6.2.4 Consultant fee: \$50

6.2.5 Air sampling professional fee: \$50

6.3 Permit fee: The fee charged for a construction permit for a NESHAP or a small asbestos abatement project shall be based upon the actual cost of work by a contractor and the estimated cost of work performed inhouse: \$10.00 per \$1,000.00 for each \$1,000.00 increment up to \$50,000.00; \$8.00 per \$1,000.00 for each \$1,000.00 increment up to \$100,000.00; and \$6.00 per \$1,000.00 for each \$1,000.00 above \$100,000.00.

6.3.1 The minimum fee charged for a construction permit for asbestos abatement shall be \$100.00.

7.0 Action On An Application

7.1 Within 5 working days after receiving an application, the Department will acknowledge receipt of the application and notify the Applicant of any deficiency in the application. Within 10 calendar days after receiving a completed application, including all additional information requested, the Department will issue a License or deny the application.

7.2 Denial

7.2.1 the Department will deny an application if it determines that the Applicant has not demonstrated the ability to comply fully with applicable requirements, procedures and standards established by the:

- a) the Department in South Carolina Regulation No. 61-86.1,
- b) U.S. Environmental Protection Agency in 40 CFR Part 61;
- c) Occupational Safety and Health Administration in 29 CFR part 1910 1001 and .134.

7.2.2 If the Applicant is denied a license, the Department will return to the Applicant the application fees, less administrative fees

7.3.3 the Department will send the denial of an application by certified mail. The Applicant may request a hearing within 10 days after receipt of the certified mail. If it receives a timely request, the Department will hold a hearing in accordance with SC Regulation No. 61-72

8.0 Conditions and Generic Alternative

8.1 In granting a License, the Department may impose reasonable terms and conditions to ensure continuous compliance with the requirements of this regulation.

8.2 In granting a License, the Department may approve an alternative procedure for controlling emission from a specified type of asbestos project provided that the following conditions are satisfied:

8.2.1 The Asbestos Abatement Entity submits in writing a specified, detailed description of the type of asbestos project and the alternative

procedure.

8.2.2 The Asbestos Abatement Entity demonstrates to the satisfaction of the Department that compliance with a procedure prescribed in this regulation is not practical or not feasible or that the proposed alternative procedure provides equivalent control of asbestos; and

8.2.3 the Department determines that compliance with the proposed alternative procedures will minimize the emission of asbestos in the air.

9.0 Reprimands, Suspensions and Revocation

The Department may reprimand any licensee or revoke or suspend any license based upon violations of any requirement stated herein or in 40 CFR Part 61 or 29 CFR 1910.1001. Reasons for reprimand, suspension, or revocation may include, but are not limited to: falsification or knowing omission of any written submittals required as part of this regulation, omission or improper use of work practices or employee protection requirements, improper disposal of ACM, spread of asbestos emissions beyond the containment area, or use of improper respirators.

10.0 Duration and Renewal of a License

10.1 Unless the Department revokes or suspends a license, the license shall remain in effect for one (1) year from the date of issuance.

10.2 the Department may renew a license annually if the Asbestos Abatement Entity:

10.2.1 Submits a completed application for a renewal on forms provided by the Department not sooner than 90 days and not later than 30 days from the date of expiration.

10.2.2 Pays to the Department by certified check, a renewal application fee as specified in Section 6.2 and

10.2.3 Has complied fully with all applicable requirements and regulations

11.0 Notification

11.1 NESHAP Sources - An Asbestos Abatement Entity which intends to engage in an asbestos project which is a NESHAP source as defined in Section 5.1, shall notify the Department in writing in accordance with the requirements of 40 CFR Part 61, most recent edition.

11.1.1 In addition to the notification requirements specified in 40 CFR 61.146 the following information shall also be provided. A notification form that will satisfy the requirements of this section and of the April 5, 1984 edition of NESHAP is included in Appendix A.

11.1.2 The name or some designation of the structure to be stripped shall be provided.

11.1.3 In addition to providing the Department with the scheduled starting and completion of the project the asbestos abatement entity

shall notify the Department's District Officer by telephone when the asbestos removal phase of the project is to begin. This oral notification shall be provided in a timely manner so that an inspection may be scheduled and performed at the discretion of the Department. A list of DHEC District Offices, phone numbers and contact persons is included in Appendix C.

11.1.4 Separate notifications shall be provided for each NESHAP project.

11.1.5 NESHAP renovation projects shall be reported at least ten days prior to commencement of the asbestos removal portion of the project. All of the information required in Appendix A, Illustration A shall be provided to the Department. The Department may waive the ten days prior notice requirement on a case by case basis although all of the required information shall still be provided as soon as possible.

11.2 Small and minor project notification.

11.2.1 Small projects shall have the same notification requirements as NESHAP projects except as provided below.

11.2.2 Small projects shall be reported by the asbestos abatement entity at least five days prior to commencement of asbestos removal. The Department may waive the five day requirement on a case by case basis.

11.2.3 Minor projects that are not regulated by NESHAP shall be reported on a quarterly basis to the Department. A log shall be maintained by the asbestos abatement entity which shall be a record of all of the minor projects. Information contained in the log shall consist of, at a minimum, the name or designation of the structure which was stripped; the amount of insulation removed; the date of the removal; who removed the insulation (building owner or contractor); and the location of the disposal site. Copies of the quarterly log shall be provided to the Department within 30 days of the end of each quarter.

11.3 An Asbestos Abatement Entity shall notify the Department in writing no later than 3 days following the beginning of an emergency abatement project.

12.0 Records

12.1 Each licensed Asbestos Abatement Entity shall maintain records of all asbestos projects which it performs and shall make these records available to the Department upon request. The Asbestos Abatement Entity shall retain the records for at least 6 years.

12.2 The Asbestos Abatement Entity shall record the following information for each project:

12.2.1 Name and address of supervisor responsible for the project;

12.2.2 The location and description of the project and estimated amount of asbestos removed or estimated area encapsulated or enclosed at each project;

12.2.3 Starting and completion dates. If completion date differs from that

originally scheduled, include statement of reasons for delay.

12.2.4 Summary of the procedures used to comply with applicable requirements including copies of all notifications;

12.2.5 Name and address of the asbestos waste disposal site and disposal receipts (these should indicate amount of material disposed of.)

12.2.6 Results of all air sampling conducted during the abatement including personal, area and clearance samples.

3.0 Penalties

An Asbestos Abatement Entity which violates any provision of this regulation is liable to the criminal and/or civil penalties of SC public Health Law 44-1-150.

NOTE: Violations of any Federal regulations which come to the attention of the Department shall be referred to the proper agency.

4.0 Reciprocity

Revocation or suspension of a contractors license in another state for violations of standards addressed in this Chapter shall be cause for suspension of license in South Carolina.

5.0 Other regulatory requirements

The requirements of this Chapter shall in no way be construed to relieve asbestos abatement entities from compliance with other regulatory requirements or contractual agreements which may be more restrictive. Direct conflicts with other regulations or statutes shall be resolved on a case by case basis.

APPENDIX A
ILLUSTRATION A
Asbestos Removal Notification Form

This form is to be completed in full and filed by the asbestos abatement entity prior to asbestos removal projects as required by 40 CFR 61.146 and South Carolina Regulation 61-86.1, Section 11.0.

CONTRACTOR

NAME: _____
ADDRESS: _____
CITY: _____ STATE: _____ ZIP: _____ PHONE: () _____

BUILDING OWNER OR OPERATOR

NAME: _____
ADDRESS: _____
CITY: _____ STATE: _____ ZIP: _____ PHONE: () _____

BUILDING INFORMATION

NAME: _____
SIZE: _____ AGE: _____ IMMEDIATE PRIOR USE: _____
ADDRESS: (street, highway no., etc) _____
CITY: _____ STATE: _____ ZIP: _____

REMOVAL INFORMATION

STRUCTURE(S) TO BE STRIPPED OR RENOVATED _____

APPROXIMATE AMOUNT OF ASBESTOS MATERIAL ON PIPES (linear feet; if none, so state; method of estimation): _____

APPROXIMATE AMOUNT OF ASBESTOS MATERIAL ON OTHER FACILITY COMPONENTS (square feet, estimation method): _____

PROCEDURES TO COMPLY WITH NESHAP (if applicable): _____

REMOVAL DATES: start _____ finish _____

DISPOSAL SITE

LANDFILL NAME: _____
ADDRESS: _____
CITY: _____ STATE: _____ STATE: _____ PHONE: () _____

*****OPTIONAL INFORMATION*****

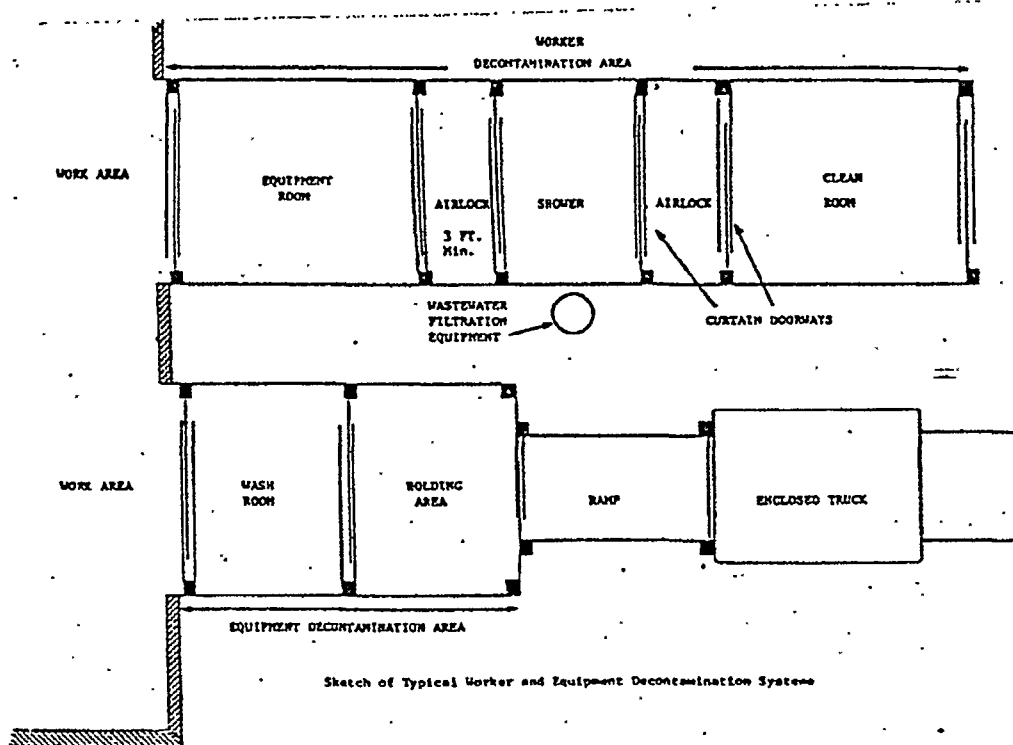
AIR SAMPLING PROFESSIONAL

NAME: _____ FIRM: _____
MAILING ADDRESS: _____ CITY: _____ STATE: _____ ZIP: _____

CONSULTANT

NAME: _____ FIRM: _____
MAILING ADDRESS: _____ CITY: _____ STATE: _____ ZIP: _____

APPENDIX A
ILLUSTRATION B



Detailed Specifications for Sampling and Analyzing Airborne Asbestos

The following specifications are summarized from "Measuring Airborne Asbestos Following an Abatement Action" USEPA, Office of Research Development and Office of Toxic Substances (1985).

- a) **Sampling Equipment.** Standard sampling equipment shall consist of a pump (operated at a 2 to 12 liter per minute flow rate), a filter in a cassette and associated tubing and supports. Three types of filters can be used:
 - 1) PCM — cellulose ester with 0.8 to 1.2 um pore size;
 - 2) TEM — polycarbonate with 0.4 um pore size; or cellulose ester with 0.8 um pore size.
- b) **Number of Samples**
 - 1) **TEM Method.** A minimum of five samples inside and five outside the work area is required. When a negative air pressure ventilation system has been used during the abatement operation the "outside" samples should be collected outside the work area, but inside the building. This provides a comparison between the work area and the incoming air. These sample sizes are based on calculations of statistical reliability and on the following characteristics:
 - A) The coefficient of variation for TEM measurements is 150% based on data from EPA research studies.
 - B) A false positive rate of .10 (i.e., based on the statistical test comparing inside and outside measurements, 10% of the "clean" work areas will fail and have to be recleaned).
 - C) A false negative rate of .10 (i.e., based on the statistical test comparing inside and outside measurements, 10% of the "dirty" work areas will pass the test).
 - 2) **PCM Method.** A minimum of five samples is required. A sample size of five controls the false negative error rate (i.e., the probability that a "dirty" work area will pass the test).

c) Location of Indoor Samples

- 1) Indoor samplers shall be placed so they are not influenced by unusual air circulation patterns. Avoid corners of rooms and obstructions (like furniture). Within the above constraints, samplers shall be placed at random around the work area. For example, if the area is a single room of 1000 or more sq. ft., the five samplers shall be distributed in an approximately uniform manner. If the area includes more than five rooms, the rooms to be sampled may be selected randomly.
- 2) When TEM is used for the air test, the five "outside" samplers shall be placed outside the work area but inside the building, and the negative air system left running during sampling. These outside samplers shall be located to avoid any air that might escape through the containment barriers. Minimum requirements are at least 50 ft. from the entry portal to the work area, or 25 ft. from the plastic containment barriers.

d) Sampling Volumes for TEM. The required sampling volume for the TEM air test is calculated from the theoretical detection limit of the TEM analysis procedures, and from typical levels of asbestos against which measurements in the work area will be compared:

$$1) \text{ Volume liters} = \frac{(1 \text{ f/10 grid squares})}{(0.005 \text{ f/cc})} \times \frac{(855 \text{ mm}^2)}{(0.0056 \text{ mm}^2)} \times \frac{(1 \text{ liter})}{(1000 \text{ cc})} = 3054$$

Where:

- A) 1 f/10 grid squares (the maximum recommended filter counting area) is the smallest number of fibers needed to make a non-zero measurement. (This is below the limit of reliable quantification.)
 - B) 0.005 f/cc is a typical outdoor asbestos level in urban areas, as measured by TEM.
 - C) 855 mm² is the collection area of a 37 mm diameter filter.
 - D) 0.0056 mm² is the area of each grid square (75 µm per side) in a 200 mesh electron microscope grid. This value will vary from 0.0056 to 0.0081 mm² for different grids. Larger grid squares will improve measurement accuracy for the same sampling volume.
- 2) This equation is appropriate for TEM analysis using a direct sample transfer technique.

APPENDIX B

- e) Sampling Volumes for PCM. The equivalent PCM limit of reliable quantification for a sampling volume of 3000 liters is:

$$1) \text{ Quantification Limit} = \frac{(10 \text{ f/100 fields})}{(3000 \text{ liters})} \times \frac{(855 \text{ mm}^2)}{(0.003 \text{ mm}^2)} \times \frac{(1 \text{ liter})}{(1000 \text{ cc})} = 0.01 \text{ f/cc}$$

Where:

- A) 10 f/100 fields is the limit of reliable quantification for the P&CAM 239 method.
- B) 855 mm² is the collection area of a 37 mm diameter filter.
- C) 0.003 mm² is the size of a typical field of view for a PCM microscope. This value will vary from 0.0003 to 0.006 mm² for different microscopes. Larger fields of view will improve (decrease) the limit of reliable quantification.
- 2) By increasing the sampling volume, the PCM test criterion can be made proportionally more stringent:

Volume	Quantification Limit
3000 liters	0.01 f/cc
5000	0.006
7500	0.004

- 3) If the sampling scheme associated with the new NIOSH 7400 PCM method is used, the limit of reliable quantification will be lower for the same sampling volume.

f) Aggressive Sampling. Procedures for sampling aggressively are:

- 1) Before starting the sampling pumps, direct the exhaust from forced air equipment (such as a 1 horsepower leaf blower) against all walls, ceiling, floors, ledges and other surfaces in the room. This shall take at least 5 minutes per 1000 sq. ft. of floor.
- 2) Place a 20-inch fan in the center of the room. (Use one fan per 10,000 cubic feet of room space.) Place the fan on slow speed and point it toward the ceiling.
- 3) Start the sampling pumps and sample for the required time.

APPENDIX B

- 4) Turn off the pump and then the fan(s) when sampling is complete.
- g) Analysis for TEM. Use the update to the EPA provisional method (USEPA Contract No. 68-02-3266 (1984)). The sample shall be transferred directly from the polycarbonate filter to the electron microscope grid.
- h) Analysis for PCM. Use the NIOSH P&CAM 239 method or the newer NIOSH 7400 method.
- i) Interpretation of Results for TEM. Use student's "t" test to compare inside and outside levels.
 - 1) Compute the natural logarithm of fiber concentration for each sample.
 - 2) Compute means of the log transformed data for inside samples and outside samples. Form the ratio

$$T = \frac{\bar{y}_1 - \bar{y}_2}{\sqrt{2/5 S}}$$

Where:

- A) $\bar{y}_1$ = average of log concentrations inside the work area
 - B) $\bar{y}_2$ = average of log concentrations outside the work area
 - C) $S = [(\sum(\bar{y}_{1j} - \bar{y}_1)^2 + \sum(\bar{y}_{2j} - \bar{y}_2)^2)/8]^{1/2}$
- 3) Then compare T to 1.86 (the 95 percentile point of a "t" distribution with 8 degrees of freedom). If T exceeds 1.86, reclean. Otherwise, release the contractor.

NOTE: This formula should be used when 5 indoor and 5 outdoor samples are collected. If a different number of samples is collected, refer to a standard statistical text for the correct formula.

APPENDIX B

- 4) The following two examples illustrate the method:

Example 1

Measurements inside
the work area (f/cc)

0.002
0.007
0.030
0.028
0.001

$\bar{y}_1 = -11.590$
 $S = 3.436$
 $T = 0.38$

Measurements outside
the work area (f/cc)

0.001
0.010
0.008
0.001
0.025

$\bar{y}_2 = -12.4063$

T is less than 1.86. The contractor is released.

Example 2

Measurements inside
the work area (f/cc)

0.052
0.130
0.005
0.240
0.375

$\bar{y}_1 = 5.850$
 $S = 3.653$
 $T = 2.84$

Measurements outside
the work area (f/cc)

0.001
0.010
0.008
0.001
0.025

$\bar{y}_2 = -12.406$

T is greater than 1.86. The area must be recleaned.

- 5) The test is based on the assumption that a homogenous work area has been selected. If one sample has a much higher concentration than the others it is possible that the area is not homogenous. Common sense should prevail in this case. Irrespective of the result of the "t" test, the high value should be investigated. The sample should be reanalyzed, additional samples collected, or the area recleaned and tested before the contractor is released.

APPENDIX B

j) Interpretation of results for PCM

- 1) The measured level of each sample is compared with the PCM limit of reliable quantification for the volume of air sampled (approximately 0.01 f/cc for 3000 liters). If any of the samples exceeds 0.01 f/cc, the work area shall be re-cleaned.
- 2) The probability that each of the 5 samples will pass the test and the contractor will be released given that the actual fiber level in the work area is as indicated below:

Actual Fiber Level (f/cc)	Probability of Release
0.001	0.998
0.002	0.94
0.003	0.81
0.004	0.64
0.005	0.49
0.01	0.12
0.02	0.01
0.05	0.0003

- 3) Thus, if the actual level is 0.01 f/cc, the probability that all samples would be 0.0095 f/cc or less is only 0.12. To be at least 80% certain of passing, the actual level would have to be 0.003 f/cc.

APPENDIX C

OFFICE OF ENVIRONMENTAL QUALITY CONTROL
DISTRICT AIR QUALITY MANAGERS

<u>LACHIA I</u> (Anderson, Oconee Counties)	Environmental Quality Control Office 220 McGee Road Anderson, S. C. 29621	225-3731
IRGE TOMLIN		
<u>ALACHIA II</u> (Greenville, Pickens Counties)	Environmental Quality Control Office 605 N. Main Street Greenville, S. C. 29601	242-9850
AUDE MILLER		
<u>ALACHIA III</u> (Spartanburg, Cherokee, Union Counties)	Environmental Quality Control Office 151 E. Wood Street Spartanburg, S. C. 29303	596-3800
N GARRETT		
<u>LANCASTER</u> (Lancaster, Chester, York Counties)	Environmental Quality Control Office 1001 W. Grace Street Lancaster, S. C. 29720	285-7461
EVE SPIGNER		
Mailing Address:	PO Box 100---Fort Lawn, S. C. 29714	
<u>CENTRAL MIDLANDS</u> (Richland, Lexington, Newberry, Fairfield Counties)	Environmental Quality Control Office Pearl Lightsey Building State Park, S. C. 29147	758-4415 -4142
JOHN HUDSON		
<u>LOW COUNTRY</u> (Beaufort, Jasper, Colleton, Hampton Counties)	Environmental Quality Control Office 149 Ribaut Square Beaufort, S. C. 29902	524-9760
MARY DUKES, FREDDY SANFORD		
<u>LOWER SAVANNAH</u> (Aiken, Orangeburg, Barnwell, Bamberg, Allendale, Calhoun Counties)	Environmental Quality Control Office 117 Marion Street, NE Aiken, S. C. 29801	648-9561
G MATTHEWS		
<u>FLORIDA</u> (Florence, Dillon, Marion, Darlington, Chesterfield, Marlboro Counties)	Environmental Quality Control Office 3204 Industry Boulevard -- Route 11 Florence, S. C. 29501	662-3522
JOHN SMITH		
<u>TRIDENT</u> (Charleston, Berkeley, Dorchester Counties)	Environmental Quality Control Office 1000 Air Park Road Charleston Heights, S. C. 29418	554-5533
BRUCE HENNESSEE, TIM AUSTIN		
<u>UPPER SAVANNAH</u> (Greenwood, Abbeville, Laurens, Saluda, Edgefield, McCormick Counties)	Environmental Quality Control Office P-129 One Park Avenue Greenwood, S. C. 29646	223-0333
BOB JACKSON		
<u>WACCAMAW</u> (Horry, Georgetown, Williamsburg Counties)	Environmental Quality Control Office 1705 Oak Street Myrtle Beach, S. C. 29577	448-1902
JOHN ALLISON		
<u>WATEREE</u> (Sumter, Kershaw, Lee, Clarendon Counties)	Environmental Quality Control Office 105 N. Magnolia Street Sumter, S. C. 29151	773-5511 778-1531
RONNIE DRIGGERS		
Mailing Address:	PO Box 1628	
(CDS: 9/84)		

EQC LAB - Hayne Building, State Park, S. C.

GLASS PLANT

ASBESTOS SURVEY

- Wilbur Street warehouse - none.
- Outside Wilbur Street - none.
- Glass warehouse - none.
- Roll conveyor to roofing - none. Pipe insulation appears to be fiberglass.
- Incinerator area; expansion joints and joint gaskets - looks like glass reinforced material (approximately 20 places). This area looks good.
- Dryer combustion system; gaskets and joints (> 25 areas) - appears to be glass reinforced material. This area looks good.
 - * Two fan and hot box insulation (500 sq. ft.) - cracked and falling apart. Looks new enough not to contain asbestos.
- Glass Plant:
 - * Steam lines (glass insulation) - none. Looks good.
 - * Hot water lines (fiberglass insulation) - none. Looks good.
 - * Dryer fan insulation (looks new).
 - * Boiler tank (fiberglass) - none.
- Basement - none.

NOTE: The Glass Plant appears to be asbestos free.

Approximate Cost: 0

GRANULE PLANT

ASBESTOS MATERIAL

- Over 95% of building wall and roof panels is corrugated transite.
- The walls and roof have many holes with broken edges.
- Two openings for doorways are planned to be cut in the transite walls within the next 60 days. (Work to be performed by environmental specialists.)
- All old steam pipe asbestos insulation was removed years ago to our knowledge.
- The transite siding is in generally good condition and is non-friable at this writing. Total replacement cost of all siding and roofing on the Granule Plant is approximately \$250,000.

LIMESTONE PLANT

NO ASBESTOS MATERIAL

Approximate Cost: 0

ROOFING PLANT

ASBESTOS MATERIAL

- Canopy siding corrugated sheets: #1 rail Shipping/Roofing.
- Roof area: Roofing Plant and Shipping.
- #13, #14, and #18 asphalt tank insulation.
- Windseal tank insulation.
- #2 slate house siding (corrugated sheets).

Approximate Cost: \$80,000.00