

MEMORANDUM

CITY OF PHILADELPHIA

TO : Judith E. Harris, City Solicitor

DATE 3/8/93

FROM : Joseph Paglia, Deputy Records Commissioner



SUBJECT: PROPOSED AMENDMENTS TO ASBESTOS CONTROL REGULATIONS

The above regulations, promulgated by the Department of Public Health, were received in the Department of Records on February 2, 1993, for filing and advertising.

Inasmuch as there were no requests for hearings, these regulations became effective midnight, March 4, 1993.

/ml

cc: Robert K. Ross, M.D., Health Commissioner

DEPARTMENT OF REVENUE
REGULATION AMENDMENTS

DEPARTMENT OF REVENUE
Passed By Board of Health
June 2, 1992

SECTION III. PERMITS AND NOTIFICATIONS

A. Major Asbestos Project Permit.

1. No person shall commence a major asbestos project on or after the effective date of these Regulations without first obtaining a permit for that project from the Department of Licenses and Inspections.

2. The Department of Licenses and Inspections shall not issue a permit for a major asbestos project unless and until the Department has certified, in writing, that the applicant has met the following requirements:

a. the applicant shall submit to the Department at least twenty (20) calendar days prior to the scheduled starting date of the major asbestos project an application accompanied by a non-refundable application fee of Twenty-Five Dollars (\$25). The permit application shall include at a minimum the following information:

(.1) name, address and telephone number of the asbestos contractor or other person responsible for the asbestos project;

(.2) name, address and telephone number of the independent certified asbestos project inspector;

(.3) name and address of independent certified laboratory;

(.4) name and address of asbestos waste transporter;

(.5) name and address of asbestos waste disposal facility;

(.6) name, address and telephone number of building owner;

(.7) address and function of building (e.g., hospital, office, school);

(.8) description of asbestos project, including amount and location of asbestos materials for each work area;

(.9) description of procedures and related equipment that will be used to comply with the major asbestos project standards established by these Regulations, including any alternative equivalent methods proposed for work area preparation;

(.10) estimated total cost of the project;

(.11) scheduled starting and completion dates for the project;

(.12) work schedule, including evening and weekend

DEPARTMENT OF REVENUE
93 FEB -2 PM 3 50

hours; and

~~(13) a list of worker protection equipment and other related asbestos abatement equipment, including, as appropriate, manufacturers names and model numbers, which will be used in the course of the major asbestos project;~~

b. the applicant shall submit a major asbestos project permit fee equal to two percent (2%) of the first Fifty Thousand Dollars (\$50,000) of the estimated cost of the asbestos abatement portion of the project, and an additional one percent (1%) of any amount over Fifty Thousand Dollars (\$50,000). The minimum fee shall be One Hundred Dollars (\$100). Incremental adjustments may be imposed based on evidence of final total costs;

c. the applicant shall have a valid license issued by the Department of Licenses and Inspections pursuant to Section II of these Regulations;

d. the applicant shall ~~submit~~ include all appropriate information and \or notifications required under the federal asbestos NESHAP, 40 CFR 61.145 and 61.146, ~~or evidence of having submitted such notifications;~~ and

e. the applicant shall certify that encapsulation, if any, will be performed in accordance with Section VI.C.5. of these Regulations.

3. The applicant shall provide a copy of the most recent asbestos project permit application to the Certified Asbestos Project Inspector at least five days prior to the commencement of the project.

B. Annual Permit.

1. The Department of Licenses and Inspections shall issue, with the approval of the Department, an annual permit to employers with on-going, in-house asbestos abatement projects involving continuous or intermittent asbestos project activity performed by the employer's own employees, except that where the project involves within three (3) months, the removal, enclosure or encapsulation of or any renovation, repair or demolition work which disturbs or damages either one-hundred sixty (160) square feet or more of friable asbestos material at one location, or two-hundred sixty (260) linear feet or more of asbestos pipe covering at one location, the employer must obtain a major asbestos project permit in accordance with Section III.A. of these Regulations.

2. To be eligible for an annual permit, the applicant must meet the following requirements:

a. the applicant shall submit an application to the Department accompanied by a non-refundable application fee of

Twenty-Five Dollars (\$25), and a permit fee of Seven Hundred Fifty Dollars (\$750);

b. the applicant shall have a valid license issued by the Department of Licenses and Inspections pursuant to Section II of these Regulations; or if the applicant is not an asbestos contractor, he/she shall be certified by the Department of Licenses and Inspections and shall submit all documentation required by Section II.B.2. through 5., inclusive, of these Regulations;

c. the applicant shall submit the exact location or building to be included under the annual permit; and

d. the applicant shall submit an annual asbestos project activity schedule, if available.

3. Employers holding a valid annual permit shall meet the following requirements:

a. employers exempted by an annual permit from obtaining major asbestos project permits shall notify the Department at least twenty-four (24) hours prior to the commencement and completion of any asbestos project activity, except in emergency situations which require immediate abatement action. In such emergency cases, employers shall notify the Department as soon as possible. Such notification shall include: starting and expected completion dates or times of the asbestos project, location of the abatement activity, amount of asbestos material involved, amount of manpower required, and method of abatement;

b. all major asbestos project activity shall comply with all major project standards, except that mandatory Department pre-inspections and final inspections may not be required; and

c. employees engaged in on-going, in-house abatement projects shall be ~~trained~~ and certified in accordance with the requirements of Sections IV and V of these Regulations and, where applicable, shall comply with any other duties and responsibilities imposed by these Regulations.

C. Minor Asbestos Project Notification.

1. No person shall commence a minor asbestos project without first notifying the Department. Notification shall be made on forms provided by the Department and shall be received by the Department no less than twenty-four (24) hours prior to the commencement of the project.

D. Permit Amendments.

1. After either a major asbestos project permit or an annual permit

has been issued, the applicant shall notify the Department, in advance, of any changes in the asbestos project not accounted for in the permit application and submit an amended permit application before completion of the asbestos project.

E. Denial, Suspension, or Revocation of Permit.

1. The Department, whenever it determines that a permittee has failed to comply with the conditions of its permit, shall serve written notice of the violation upon the permittee pursuant to Section 9-103 of The Philadelphia Code; the notice shall include the specific reasons for the intended action.

2. The Department of Licenses and Inspections, upon certification by the Department that a person has failed to comply with or meet the requirements of Chapter 6-600 of The Philadelphia Code or these Regulations, shall deny, suspend, or revoke a permit in accordance with Section 9-103 of The Philadelphia Code. Revocation of a permit shall result in the forfeiture of the permit fee.

3. Any action taken by the Department of Licenses and Inspections pursuant to this Section may be appealed to the Board of License and Inspection Review in accordance with that Board's procedures.

DEPARTMENT OF RECORDS
93 FEB -2 11 51

REGULATION AMENDMENTS

Passed by Board of Health
June 2, 1992

SECTION IV. CERTIFICATION

A. Asbestos Workers Certification.

1. No individual shall engage in an asbestos project unless that individual is certified as an asbestos worker by the Department of Licenses and Inspections.

2. The Department of Licenses and Inspections shall not issue an asbestos worker certificate unless and until the Department has certified, in writing, that the applicant has met the following requirements:

a. the applicant shall be at least eighteen (18) years of age at the date of application;

b. the applicant shall submit an application for certification accompanied by a fee of Twenty-Five Dollars (\$25) to the Department; and

c. the applicant shall submit:

(.1) the training certificate issued upon successful completion, within the prior six (6) months, of a Department-certified initial asbestos worker training course, including passage of a written examination; or

(.2) (.a) a chronological list of asbestos abatement activities in which the applicant has participated, which at a minimum shall indicate two years of experience in asbestos project activity. The list shall include the employer's or asbestos contractor's name, address, and telephone number; and

(.b) certificates evidencing successful completion of training programs which have been reviewed and approved by the Department; or

(.3) a currently valid asbestos worker certification from another jurisdiction provided that such certification has been approved by the Department.

3. Asbestos worker certification shall be valid for thirteen (13) months from the completion date of a Department-certified training or review course. Where the applicant has been exempted from completing an initial training course, the certification shall be valid for thirteen (13) months from the date of issuance.

4. Certified asbestos workers may apply for renewal of their certificates to the Department, beginning thirty (30) days prior to the expiration date of the certificates, by submitting the following information:

a. an application for renewal of certification, accompanied by a certification renewal fee in the amount of Twenty-Five Dollars (\$25); and

b. the training certificate issued upon successful completion, within the prior six (6) months, of a Department-certified review course, including passage of a written examination.

Any individual who fails to renew his/her certificate for three (3) consecutive years shall be required to complete an initial training course in order to have his/her certificate renewed.

5. All asbestos worker certificates shall be in the form of an identification card to which a photograph of the applicant is affixed. Said identification shall be worn in a visible fashion by the certified asbestos worker while engaged in asbestos project activity.

B. Asbestos Project Supervisor Certification...

1. No person shall supervise asbestos workers engaged in an asbestos project unless that person is certified as an asbestos project supervisor by the Department of Licenses and Inspections.

2. The Department of Licenses and Inspections shall not issue an asbestos project supervisor certificate to an applicant unless and until the Department has certified, in writing, that the applicant has met the following requirements:

a. the applicant shall be at least eighteen (18) years of age at the time of application;

b. the applicant shall submit an asbestos project supervisor certification application, accompanied by a fee of Twenty-Five Dollars (\$25), to the Department. The applicant shall be required to demonstrate that he/she has had at least one year's experience in asbestos abatement activities by providing the Department with the following information:

(.1) the name, address, and telephone number of all asbestos contractors and/or employers for whom the applicant has performed asbestos abatement activities;

(.2) the number of hours worked per week on asbestos abatement activities; and

(.3) applicant's job title(s) and a brief description(s) of duties;

c. the applicant shall also submit:

(.1) the training certificates issued upon successful completion, within the prior six (6) months, of both a Department-certified asbestos worker training course and an additional Department-certified supervisory training course, including passage of a written examination for each training course; or

(2) (a) a chronological list of asbestos abatement activities in which the applicant has participated, which at a minimum shall indicate two years of experience as an asbestos project supervisor. The list shall include the employer's or asbestos contractor's name, address, and telephone number; and

(b) certificates evidencing successful completion of training programs which have been reviewed and approved by the Department; or

(3) a currently valid asbestos project supervisor certification from another jurisdiction provided that such certification has been approved by the Department.

3. Asbestos project supervisor certifications shall be valid for thirteen (13) months from the completion of a Department-certified training or review course. Where the applicant has been exempted from completing an initial training course, the certification shall be valid for thirteen (13) months from the date of issuance.

4. Certified asbestos project supervisors may apply for renewal of their certificates to the Department beginning thirty (30) days prior to the expiration date of the certificates, by submitting the following information:

a. an application for renewal of certification, accompanied by a certification renewal fee in the amount of Twenty-Five Dollars (\$25);

b. the training certificate issued upon successful completion, within the prior six (6) months, of a Department-certified approved review course, including passage of a written examination.

Any person who fails to renew his/her certificate for three (3) consecutive years shall be required to complete an initial training course in order to have his/her certificate renewed.

5. All asbestos project supervisor certificates shall be in the form of an identification card to which a photograph of the applicant is affixed. Said identification shall be worn in a visible fashion by the certified asbestos project supervisor while engaged in asbestos project activity.

C. Asbestos Project Inspector Certification.

1. No person shall act as an asbestos project inspector unless that person has been certified as an asbestos project inspector by the Department of Licenses and Inspections.

2. The Department of Licenses and Inspections shall not issue an asbestos project inspector certificate to any applicant unless and until the Department certifies, in writing, that the applicant has met the following requirements:

DEPARTMENT OF REFORMS
FEB - 2 AM 8 50

- a. the applicant shall be at least eighteen (18) years of age as of the date of application;
- b. the applicant shall submit an asbestos project inspector application, accompanied by a fee of One Hundred Dollars (\$100);
- c. the applicant shall submit evidence of having obtained an associates degree in biology, chemistry, industrial hygiene, environmental science, or related fields, or, alternatively, evidence of one (1) year of employment experience performing environmental assessment activities in industrial hygiene or environmental science;
- d. the applicant shall submit evidence of successful completion of a course in air monitoring methods which was part of either an academic curriculum or a continuing education course and which consisted of a minimum of thirty (30) contact hours and included hands-on experience using and calibrating various types of air monitoring equipment, or, alternatively, evidence of six (6) months of employment experience performing air monitoring which included at least thirty (30) hours of on-the-job training;
- e. the applicant shall submit evidence of successful completion of a training course for asbestos project supervisors which has been reviewed and approved by the Department, including passage of a written examination; or two (2) years of experience in continuous monitoring asbestos abatement activities and provide a chronological listing of such activities by building owner's name and location;
- ~~f. the applicant shall have one (1) year of experience in continuous monitoring of asbestos abatement activities, and provide a chronological listing of such activities by building owner's name and location;~~
- ~~g. the applicant shall be permitted to substitute for e, d, e, and f above a currently valid certificate as a New Jersey asbestos safety technician;~~
- ~~h. f.~~ the applicant shall successfully complete a Department-provided course for asbestos project inspectors, and achieve a passing grade on a Departmental examination;
- ~~i. g.~~ the applicant shall certify that he/she will engage to perform on-site analyses only analytical testing laboratories certified by the Department; and
- ~~j. h.~~ the applicant shall submit a description of his/her resources, laboratory affiliations, and the methods which he/she will employ to insure that the monitoring requirements of these Regulations are fully implemented.

3. Asbestos project inspector certifications shall be valid for twelve (12) months from the date of issuance.
4. Certified asbestos project inspectors may apply for renewal of the certificate to the Department, but not later than thirty (30) days prior to the expiration date of their certifications, by submitting the following information:
 - a. an application for renewal of certification, accompanied by a certification renewal fee of One Hundred Dollars (\$100); and
 - b. the training certificate issued upon successful completion of a Department-certified approved review course for asbestos project supervisors, including passage of a written examination.

Any person who fails to renew his/her certificate for three (3) consecutive years shall be required to complete an initial training course in order to have his/her certificate renewed.

D. Asbestos Investigator Certification.

1. No person shall act as an asbestos investigator unless that person has been certified as an asbestos investigator by the Department of Licenses and Inspections.
2. The Department of Licenses and Inspections shall not issue an asbestos investigator certificate unless and until the Department has certified, in writing, that the applicant has met the following requirements:
 - a. the applicant shall be at least eighteen (18) years of age at the time of application;
 - b. the applicant shall submit an asbestos investigator certification application, accompanied by a fee of One Hundred Dollars (\$100), to the Department;
 - c. the applicant shall submit the training certificate issued upon successful completion, within the prior six (6) months, of a Department-certified asbestos investigator training course, including passage of a written examination; and
 - d. the applicant shall submit:
 - (.1) a copy of a license or certificate as a professional engineer, registered architect, certified industrial hygienist, or certified safety professional; or
 - (.2) evidence of having obtained a bachelor's degree in engineering, architecture, environmental health science, or a related field, and documentation of one (1) year of experience in building survey/hazard assessment for asbestos plus one (1) additional year of other related experience; or
 - (.3) documentation of two (2) years of experience in building survey/hazard assessment for asbestos plus

- three (3) additional years of other related experience.
3. Asbestos investigator certification shall be valid for twelve (12) months from the date of issuance.
 4. Certified asbestos investigators may apply for renewal of their certificates to the Department, beginning thirty (30) days prior to the expiration date of the certificates, by submitting the following information:

- a. an application for renewal of certification, accompanied by a certification renewal fee in the amount of One Hundred Dollars (\$100); and
- b. the training certificate issued upon successful completion, within the prior six (6) months, of a Department-certified review course.

Any person who fails to renew his/her certificate for three (3) consecutive years shall be required to complete an initial training course in order to have his/her certificate renewed.

E. Analytical Testing Laboratories Certification.

1. No laboratory shall engage in the analysis of bulk, dust, or air samples for asbestos content unless that laboratory has been certified by the Department of Licenses and Inspections.

2. The Department of Licenses and Inspections shall not issue an analytical testing laboratory certification to an applicant unless and until the Department certifies, in writing, that the applicant has met the following requirements:

- a. the applicant shall submit an application for certification, accompanied by an application fee of Three Hundred Dollars (\$300), to the Department; and

- b. the applicant shall submit the following:

- ~~(1) the name and address of the laboratory, the name of the laboratory owner or his/her authorized representative and his/her telephone number;~~

- ~~(2) the qualifications of the management and the technical personnel at the laboratory;~~

- ~~(3) a list of the equipment used at the laboratory to analyze bulk, dust, and/or air samples for asbestos content, including names and model numbers;~~

- ~~(4) the capability of the laboratory to perform the latest NIOSH and EPA approved protocols; and~~

- ~~(5) a list of all prior experience which the laboratory has had in performing similar or related activities;~~

- c. for phase contrast microscopy (PCM) the laboratory shall have the following qualifications:

- ~~(1) demonstrated skills in the appropriate methodology for PCM;~~

~~(2) participation in the NIOSH Proficiency Analytical Testing (PAT) program; and~~

~~(3) current accreditation by the American Industrial Hygiene Association (AIHA) or the National Bureau of Standards (NBS) for PCM, or for individual microscopists, listing in the Asbestos Analysis Registry of the AIHA;~~

d. for transmission electron microscopy (TEM) the laboratory shall have the following qualifications:

~~(1) demonstrated skills in the appropriate methodology for TEM; and~~

~~(2) general current accreditation for TEM by the American Industrial Hygiene Association (AIHA) or by the National Institute Bureau of Standards and Technology (NBS) (NIST), until one (1) year after the establishment of specific accreditation for TEM by the AIHA or NBS, at which time such accreditation will be required;~~

e. for bulk analysis the laboratory shall ~~participate in the EPA Research Triangle Institute (RTI) Asbestos Identification Bulk Quality Assurance Program maintaining a ninety percent (90%) results correct rating for type and quantification, and show capability for bulk analysis for low content asbestos materials by the RTI 400 point count method~~ be accredited by the NIST.

3. Analytical testing laboratory certifications shall be valid for twelve (12) months from the date of issuance.

F. The Department shall, whenever it finds that a holder of any certification has failed to comply with the provisions of Chapter 6-600 of The Philadelphia Code or these Regulations, certify such finding to the Department of Licenses and Inspections in accordance with the procedures set forth in Section 9-103 of The Philadelphia Code.

G. The Department of Licenses and Inspections, upon a finding by the Department that the holder of any certification issued pursuant to this Section has failed to comply with the provisions of Chapter 6-600 of The Philadelphia Code or these Regulations, shall deny, suspend, revoke or refuse to renew such certification, in accordance with the finding of the Department. Suspension of any certification shall not generate a fee credit, and revocation will result in fee forfeiture.

H. Any action taken by the Department of Licenses and Inspections pursuant to this Section may be appealed to the Board of License and Inspection Review in accordance with that Board's procedures.

REGULATION AMENDMENTS

Passed by Board of Health
June 2, 1992

SECTION VI. STANDARDS FOR MAJOR ASBESTOS PROJECTS

A. General.

For all major asbestos projects, an independent certified asbestos project inspector shall be employed or retained by the building owner to monitor the asbestos project, to perform all required initial, project, and clearance air sampling, and to conduct visual inspections during the course of the asbestos project in order to protect building occupants and the general public from exposure to asbestos.

1. The asbestos project inspector shall have the authority to direct the asbestos contractor or asbestos project supervisor to correct any violations of the standards and procedures established under these Regulations. If the asbestos contractor or supervisor fails to correct any violation as directed by the asbestos project inspector, the inspector shall notify the Department immediately.

2. The asbestos project inspector shall keep written records on the asbestos project, including records of visual inspections, air monitoring, and violations, and shall immediately report any serious or repeated violations of the provisions of these Regulations to the Department. The asbestos project inspector may recommend to the Department suspension of asbestos project activity, removal of asbestos workers from the work area, or evacuation of the building in order to protect building occupants and the general public from exposure to asbestos.

B. Work Area Preparation

1. The provisions of this Section VI.B. shall apply to all major asbestos projects, except where the asbestos abatement is performed solely by containment-bag techniques in which case the work area preparation shall comply with the provisions of Section VI.C.3.c. of these Regulations.

2. The building owner or designated representative shall provide at least ten (10) calendar days advance notification of intended asbestos abatement activity to all occupants within the work area and areas adjacent to the asbestos project. The notification shall include: the name of the contractor, the project location and scope, amount and type of asbestos, abatement procedure, dates of expected occurrence, and the telephone number for Air Management Services. Postings of this notification shall be in English (and other languages appropriate to the population of occupants within the work area and adjacent areas), at eye level, in a conspicuous, well-lit place, at the entrances to the work area and immediate adjacent areas. The notice shall have the heading, NOTICE OF ASBESTOS ABATEMENT, in a minimum of

one-inch Sans Serif gothic or block style lettering. All other lettering shall be in a minimum of one-quarter inch Sans Serif gothic or block style. The notice shall be posted until the Department certifies that the re-occupancy standard has been met. A lessee initiating an asbestos project shall give ten (10) calendar days' notice to the owner of the subject building prior to the start of the asbestos project.

3. Caution signs meeting the specifications of OSHA 29 CFR 1926.58 K(1)(ii), shall be posted at all entrances to a location where airborne concentrations of asbestos may exceed ambient background levels. Caution signs shall be posted in English and other appropriate languages.

4. Occupants shall be removed from any floor where an asbestos project is in progress, unless the work area is completely separated from the occupied area either by an airtight physical barrier, such as a wall, or by an isolation barrier, with the work area under negative pressure.

5. When an isolation barrier is required it shall be constructed as follows:

a. partitions shall be constructed of, at a minimum, conventional 2x3 wood, polyvinyl chloride piping, or metal stud framing or equivalent, on a sixteen-inch maximum center-to-center (16"CC) to support barriers in all openings larger than thirty-two (32) square feet, except where any one dimension is one (1) foot or less;

b. a solid construction material (e.g., plywood) of at least three-eighths-inch (3/8") thickness shall be applied to the work side of the framing where the barrier could be subject to damage from activity adjacent to the work area; and

c. the partition shall be plasticized in accordance with paragraph 18. below.

6. Prior to erection of partitions, asbestos materials that will be disturbed during this activity shall be:

a. treated first with amended water or a removal encapsulant; and

b. removed, using a tent procedure (see Section VI.C.4. of these Regulations); or removed by an equivalent procedure approved by the Department.

(.1) removal by these procedures shall be limited to a maximum of a one (1)-foot-wide strip running the length and/or height of the partition and is allowed only to facilitate erection of the partitions.

7. Prior to plasticizing as required under paragraph 18. below:

a. movable objects within the proposed work areas shall be pre-cleaned using HEPA-filtered vacuum equipment and, where

feasible, wet cleaning methods, and such objects shall be removed from the work area. Upholstered furniture, carpeting and drapes shall be HEPA-vacuumed before removal from the work area. If the objects are disposed of as asbestos waste material in accordance with Section VI.C.7. of these Regulations, cleaning is unnecessary. If carpeting is left in place, it shall be covered with plastic sheeting and one-half (1/2)-inch rigid flooring prior to plasticizing as required under paragraph 18. below;

b. fixed objects which will remain within the proposed work areas shall be pre-cleaned using HEPA-filtered vacuum equipment and, where feasible, wet cleaning methods and enclosed with one (1) layer of plastic sheeting sealed with tape; and

c. all other surfaces in the proposed work areas shall be pre-cleaned using HEPA-filtered vacuuming equipment.

8. Except to allow for the entry of air necessary to maintain negative pressure, the work area shall be isolated by completely enclosing the work area and sealing off all doors, windows, ducts, grills, diffusers, and any other penetrations of the work areas with two (2) layers of plastic sheeting and tape. All seams of system components that pass through the work area shall also be sealed.

9. After the isolation barriers required in paragraph 4. above have been erected, ceiling-mounted objects not previously sealed; that will interfere with the asbestos abatement project, shall be removed and cleaned. Amended water spraying or HEPA-filtered vacuuming shall be used during the process of removing any ceiling-mounted objects to reduce the dispersal of asbestos fibers.

10. Suspended ceiling tiles and T-grid components contaminated by friable asbestos materials shall remain in place until:

a. the work area has been fully prepared as outlined in Section VI.B. of these Regulations; and

b. electrical and HVAC systems have been shutdown:

(.1) if any suspended ceiling tiles and T-grid components are to be retained for reuse, they shall be removed and vacuumed with HEPA-filtered equipment and wet-cleaned; otherwise, they shall be removed and disposed of as asbestos waste in accordance with Section VI.C.7. of these Regulations.

11. Emergency exits from the work areas shall be maintained, or alternative exits shall be maintained in accordance with Title 5 of the Philadelphia Code and any other applicable provisions. Emergency exits shall be checked daily against exterior blockage or impediments to exiting.

12. Entrances to the work area that will not be used for worker entry or emergency exits shall be locked to prevent unauthorized entry.

13. Floor drains shall be sealed individually with two layers of plastic sheeting and tape, and then covered in accordance with paragraph 18. below. Pits, sumps, etc., shall be covered with adequate plywood sheeting and secured to floor slabs in a manner which prevents a tripping hazard, prior to plasticizing as required in paragraph 18. below.

14. Elevators running through the work area shall be shutdown, except as provided in subdivision b. of this paragraph:

a. the elevator door in the work area shall be enclosed with conventional 2x3 stud framing, covered with three-eighths-inch (3/8") plywood sheathing and sealed at all edges and seams. This barrier shall be covered and lapped for eight (8) inches with two (2) layers of plastic sheeting adhered individually with edges taped for air tightness; and

b. elevators may remain in operation where shut-down would severely restrict usage of the remainder of the occupied building. In these situations:

(1) elevator control shall be modified to bypass the work area, if possible;

(2) a final larger layer of plastic sheeting shall be taped across the opening, airtight but with slack forming a larger perimeter diaphragm. Air leakage across the barrier shall be corrected upon discovery, and the elevator shaft shall be checked for airborne asbestos contamination; and

(3) smoke tests shall be conducted daily by the independent certified project inspector.

15. Heating, cooling, and ventilating air systems into or out of the work area shall be shut down to prevent contamination and dispersal of asbestos fibers to other areas of the structure.

16. Electrical power shall be shut down, tagged, and locked out to all work areas, except to those work areas where it is necessary that electrical equipment remain in service. Safe, temporary power and lighting that are waterproof, when applicable, shall be provided in accordance with Title 4.1 of the Philadelphia code and any other applicable provisions. All power to work areas shall be brought in from outside the area through ground-fault interrupter at the source. Necessary stationary electrical equipment within the work area shall be adequately enclosed and ventilated.

17. A worker decontamination enclosure system shall be installed or constructed prior to plasticizing the work area and before disturbing asbestos material. The area in which these systems are located shall

require heating, ventilating and air-conditioning system isolation in accordance with paragraph 8. above, and plasticizing of electrical outlets and equipment.

18. All floor and wall surfaces shall be covered and sealed with plastic sheeting, using a minimum of two (2) layers. The plastic layers on the floor shall extend twelve (12) inches up the walls. Walls shall be covered with plastic sheeting down to the floor level, thus overlapping the floor covering by a minimum of twelve (12) inches. There shall be a distance of at least twelve (12) inches between the seams of adjacent layers.

19. Worker decontamination enclosure systems shall be provided outside the work area and shall be attached to all locations where workers will enter or exit the work area:

a. the worker decontamination enclosure system shall consist of a clean room, a shower room, and an equipment room, in series, separated from each other and from the work area by airlocks and from the non-work area by a lockable, shuttered door. (Either existing rooms or newly-constructed rooms may be used.);

b. each room of the worker decontamination enclosure system shall be lined with, at a minimum, two (2) layers of plastic sheeting, or the equivalent;

c. when the worker decontamination enclosure system is constructed outdoors or in areas with public access, it shall be fully framed and sheathed with plywood or its equivalent to prevent unauthorized entry. When located outdoors, the system shall be waterproof and windproof;

d. prefabricated or trailer decontamination systems shall:

(.1) at a minimum, be as functional and secure as a constructed worker decontamination enclosure system; and

(.2) be completely decontaminated prior to removal from the work site;

e. the clean room shall:

(.1) be sized adequately to accommodate the entire work crew; and

(.2) contain secure crew lockers or shelves, where space permits, and clean sealable plastic bags for storage of street clothes; and

(.3) contain a sufficient quantity of benches; and

(.4) contain shelves or appropriate facilities for storage of respirators; and

(.5) contain clean disposable clothing, replacement filters for respirators, towels and other necessary personal

protective equipment; and

(.6) not be used for storage of tools, equipment, or materials, other than personal protective equipment, nor used as office space; and

(.7) be equipped with a lockable, shuttered door which opens on make-up air inflow and seals on air flow cessation for interior and exterior exits. The door shall permit entrance to the clean room and secure the work place during off-shift hours. Equipment alternatives to this standard design may be utilized with the approval of the Department;

f. the shower room shall:

(.1) contain a minimum of one (1) shower per eight (8) workers calculated on the basis of the largest shift; and
(.2) be supplied with hot and cold water adjustable at the tap; and

(.3) be constructed to ensure against water leakage; and
(.4) contain liquid bath soap, shampoo, and clean, dry towels in sufficient quantity for each showering:

(.a) shower water that is not used for the purpose of rewetting asbestos waste materials shall be drained, collected and filtered through a system with at least five (5.0) micron particle size collection capability. A system containing a series of several filters with progressively smaller pore sizes shall be used to avoid rapid clogging of the filtration system by large particles:

(i) filtered wastewater shall be discharged either to a sewer or drummed and then properly disposed; and

(ii) used filters shall be disposed of as asbestos waste material in accordance with Section VI.C.7. of these Regulations;

g. the equipment room shall:

(.1) be used for storage of equipment and tools used on the job that have been decontaminated previously in the work area;

(.2) contain a supply of replacement filters (in sealed containers until used) for HEPA vacuums and negative pressure ventilation equipment, extra tools, containers of surfactant and other materials and equipment that may be required during the abatement activity;

(.3) contain labeled six (6)-mil polyethylene bags for collection of disposable clothing;

(.4) be used to store contaminated footwear (e.g. rubber boots and other reusable footwear) and contaminated clothing for reuse for the duration of the abatement activity or until disposed;

h. adequate toilet facilities shall be provided in the vicinity of the clean room, external to the work area. Where such facilities do not exist, portable service shall be provided.

20. A negative pressure ventilation system shall be established to maintain negative air pressure in the work area at all times in order to prevent airborne asbestos fibers from escaping the work area:

a. the negative pressure ventilation equipment shall operate continuously, twenty-four (24) hours a day, from the time of the erection of isolation barriers through successful clearance air monitoring in accordance with Section VI.D.4.c. of these Regulations. An operational failure of the negative pressure ventilation equipment shall require areas adjacent to the work area to be monitored for asbestos fibers;

b. a static negative air pressure two-hundredths (0.02) inches (minimum) water column shall be maintained at all times in the work area during the abatement activity to ensure that contaminated air in the work area does not filter into uncontaminated areas;

c. if more than one ventilation unit is installed, each unit shall be turned on, one at a time, while monitoring the integrity of all critical and/or isolation barriers for secure attachment and the need for additional reinforcement;

d. a dedicated power supply for the negative pressure ventilating units shall be utilized;

e. upon the loss of negative air pressure, the abatement activity shall stop immediately and shall not resume until negative pressure is restored. When loss of negative pressure lasts or is expected to last longer than one hour:

(.1) the make-up air inlets shall be sealed airtight;

(.2) the worker decontamination enclosure system(s) shall be sealed airtight after the evacuation of personnel from the work area; and

(.3) all areas adjacent to the work area shall be monitored for asbestos fiber concentration throughout the duration of the loss of negative air pressure;

f. negative pressure ventilation equipment shall be installed and operated to provide at least one air change in the work area every fifteen (15) minutes;

g. additional make-up air may be delivered to the work area through horizontal shutters which open on make-up air inflow

and seal on air flow cessation, or through a HEPA-filtered ventilation system;

h. openings made in the isolation barrier to accommodate negative pressure ventilation equipment shall be made airtight; equipment shall be located in a secure area;

i. negative air pressure equipment shall be in compliance with ANSI Z9.2 (1979), Local Exhaust Ventilation;

j. negative air pressure systems shall be operated in accordance with, "Guidance for Controlling Asbestos-Containing Materials in Buildings", Appendix J, Specifications and Operating Procedures for the Use of Negative Pressure System for Asbestos Abatement, EPA Report Number 560/5-85-024 (1985);

k. negative pressure ventilation equipment shall be exhausted to the outside of the building away from occupied areas except as provided in subdivision 1. below:

(.1) at no time shall the negative pressure ventilation unit exhaust within entrances of the building or adjacent buildings;

(.2) heavy-duty ducting, equivalent to, or larger than, the shape and dimension of the negative pressure ventilation exhaust port shall be used to exhaust to the outside of the structure; and

(.3) all ducting shall be sealed and braced or supported to maintain airtight joints;

l. where ducting to the outside is not possible, careful installation, smoke testing, air monitoring and daily inspections of ducting shall be performed to insure that the ducting does not release asbestos fibers into uncontaminated building areas.

21. The Department may approve alternative equivalent methods for work area preparation proposed in the permit application if the methods required by this Section are not technically feasible or would cause unsafe or unhealthy conditions. A request to the Department for approval of alternative equivalent methods shall include the reasons for not using the methods required by this Section and a description of the proposed alternative methods.

C. Asbestos Project Procedures

1. General Procedures

a. No removal, encapsulation, or enclosure of asbestos materials may begin until the Department has performed a pre-inspection of the work area to ensure that the work area has been properly prepared in accordance with this Section and that all necessary equipment is in place to protect building occupants and the general public;

b. No person shall enter the work area during an asbestos

project without proper equipment and clothing and training;

c. The contractor or supervisor of an asbestos project shall provide all authorized persons who enter the work area with the required protective clothing and equipment, in accordance with applicable federal regulations, including disposable protective clothing (including full-body coveralls, head and foot covers, gloves) and appropriate respirators;

d. The contractor or supervisor of an asbestos project shall ensure that:

(.1) all individuals refrain from eating, drinking, and smoking in the work area and other contaminated areas;

(.2) all workers and authorized visitors enter the work area through the worker decontamination enclosure system;

(.3) all individuals who enter the work area sign an entry log, located in the clean room, upon each entry and exit. The pages of the log shall be permanently bound together and shall identify fully the facility, owner, agents, contractor(s), the project, each work area, worker respiratory protection employed, and date and time of entry and exit. The entry log headings shall indicate, and the signatures shall be used to acknowledge, that the regulations and procedures have been reviewed and understood by all persons prior to entering the work area. The postings and log headings shall be in English and other appropriate languages. The asbestos project supervisor shall be responsible for the maintenance of the log during the abatement activity. The log shall be available for examination during general business hours by the Department, the owner and the project workers;

(.4) all individuals, before entering the work area, are familiar with all posted regulations, personal protection requirements and emergency procedures;

(.5) all individuals proceed first to the clean room, remove all street clothing, store these items in clean, sealable plastic bags or a locker, and don respiratory protection, disposable coveralls, head covering, foot covering and gloves. Clean respirators, filters, if appropriate, and protective clothing shall be provided and utilized by each person on each occasion when he/she enters the work area;

(.6) individuals wearing the designated personal protective clothing and equipment proceed from the clean room, through the shower room, to the equipment

room where necessary tools are collected and any additional clothing (deck shoes, hard hats, goggles and/or overalls) are donned before entry into the work area;

(.7) before leaving the work area, each individual removes the gross contamination from the outside of the respirators and protective clothing by wet cleaning and/or HEPA-filtered vacuuming;

(.8) in the equipment room, all personal protective equipment, except respirators, are removed; disposable clothing shall be deposited into the appropriate containers for disposal in accordance with Section VI.C.7. of these Regulations. Reusable contaminated clothing, footwear, and/or head gear shall be stored in the equipment room when not in use;

(.9) each individual, while still wearing a respirator, proceeds to the shower room, cleans the outside of the respirator and his/her exposed face area under running water prior to removing the respirator, and then fully and vigorously showers and shampoos to remove residual asbestos contamination. Respirators shall be washed thoroughly with soap and water. Various types of respirators may require slight modification of these procedures; and

(.10) individuals, after showering and drying, proceed to the clean room and don clean disposable clothing if returning to the work area or, if not, street clothing; and

e. Air monitoring to determine worker exposure to asbestos fibers shall be conducted for all asbestos workers not covered by the OSHA asbestos standards, in accordance with the applicable EPA and OSHA standards.

2. General Removal Procedures

a. The asbestos material shall be sprayed with amended water. The amended water shall be tested on a small area before use to ensure effectiveness. A fine low-pressure spray of amended water shall be applied to prevent disturbance of asbestos fibers prior to removal. The amended water shall be sprayed on as many times and as often as necessary to ensure that the asbestos nearest the substrate of the asbestos material is thoroughly wetted to prevent dust emission. Removal of dry asbestos material shall be permitted only when removal of wet asbestos material is not feasible and only with the prior approval of the Department;

b. Asbestos material located more than fifteen (15) feet above

the floor shall be removed and lowered into inclined chutes, lowered onto scaffolding, or containerized at that height for later disposal. Asbestos materials shall not be dropped or thrown to the floor from fifteen (15) feet or greater. For materials at heights greater than forty (40) feet above the floor, a dust-tight, enclosed chute shall be constructed to transport removed asbestos material directly to containers located on the floor;

c. The asbestos material shall be disposed of in accordance with Section VI.C.7. of these Regulations;

d. After all of the asbestos material has been removed from the structure, all surfaces from which asbestos has been removed shall be scrubbed using nylon or bristle brushes and wet-sponged, or cleaned by an equivalent method approved by the Department, to remove all visible asbestos material. During cleaning the surfaces shall be kept wet using amended water;

e. All accessory equipment shall be moved to the equipment room in sealed six (6)-mil plastic bags and decontaminated for removal;

f. All free water (in contaminated areas) shall be retrieved and added to asbestos waste for disposal and/or placed in plastic-lined leak-tight drums for disposal in accordance with Section VI.C.7. of these Regulations; and

g. Containment-bag techniques shall be used to the maximum extent feasible for removal of asbestos pipe insulation or other appropriate asbestos materials as outlined in paragraph 3. below.

3. Containment-Bag Technique

a. The removal of asbestos by use of the containment-bag technique shall be limited to asbestos insulation from pipe fittings, elbows, and pipe. Containment bags are for single use and shall not be repositioned;

b. A minimum of two persons are required to perform asbestos material removal by the containment-bag technique. A third person may be required to conduct air monitoring and assist with supplies;

c. Work areas where removal of asbestos materials is performed solely by the containment-bag technique shall be prepared as follows:

(.1) notification of asbestos abatement and caution signs shall be posted in accordance with Section VI.B.3. of these Regulations;

(.2) all necessary materials and supplies shall be brought into the work area before any removal begins;

- (.3) building occupants shall be removed from any floor where a removal project is in progress unless the work area is completely separated by an airtight physical barrier such as a wall, or by an isolation barrier;
 - (.4) the work area shall be separated from the rest of the work site by isolation barriers consisting of solid physical barriers such as ceiling, floors, and walls, or solid partitions as described in Section VI.B.5. of these Regulations, with all openings such as doors, windows, and air vents covered with a single layer of plastic sheeting;
 - (.5) at least one layer of plastic sheeting shall be taped to the floor beneath the pipes subject to the abatement extending at least five (5) feet from the area of removal in all directions; and
 - (.6) the provisions of Section VI.B.7. and 15. of these Regulations shall be followed;
- d. The following is a list of required equipment and tools for the removal of asbestos by the containment-bag technique:
- (.1) the containment bag which consists of a six (6)-mil bag fitted with long sleeve gloves, a tool pouch and a two-inch opening used for water application;
 - (.2) a pump-up sprayer (garden type) with a two or three gallon capacity;
 - (.3) amended water;
 - (.4) six (6)-mil polyethylene disposal bags with the proper markings for asbestos waste;
 - (.5) a HEPA-filtered vacuum with a capillary tube for insertion into the containment bag;
 - (.6) tools such as: a small scrub brush, a utility knife for cutting the insulation, a stapler, wire cutters, smoke tubes with aspirator bulb, a bone saw, tin snips, duct tape, and wettable cloths;
 - (.7) a roll of six (6)-mil polyethylene; and
 - (.8) an encapsulant (tinted).
- e. Removal procedures shall be conducted as follows:
- (.1) a visual inspection of the pipe where the work will be performed shall be made to determine if any damaged pipe covering (broken lagging, hanging etc.) exists. If so, the pipe shall be wrapped in polyethylene and fully secured with duct tape. Debris on the floor and other surfaces which has accumulated and contains asbestos must be properly disposed. If the pipe is undamaged, one layer of duct tape shall be placed

around the pipe at each end of where the containment bag will be attached. The pipe insulation diameter worked shall not exceed one-half the bag working length above the attached gloves;

(.2) slit the top of the containment bag open (if necessary) and cut down the sides to accommodate the size of the pipe (about two inches longer than the pipe diameter);

(.3) place the necessary tools into the pouch located inside the containment bag. This will usually include the bone saw, utility knife, rags, scrub brush, wire cutters, tin snips and pre-cut wettable cloth. Cut out two (2) doughnut shapes in the cloth with the inner diameter one-half inch smaller than the diameter of the pipe beneath the insulation. Finally, cut a slit in each of the two doughnuts so they can be slipped around the pipe;

(.4) one strip of duct tape shall be placed along the edge of the open top slit of the containment bag for reinforcement;

(.5) place the containment bag around the section of pipe to be worked on and staple the top together through the reinforcing duct tape. Staple at intervals of approximately one inch. Next, fold the stapled top flap back and tape it down with a strip of duct tape. Next, duct tape the ends of the containment bag to the pipe itself, previously covered with plastic or duct tape (see subdivision (.1) above);

(.6) using the smoke tube and aspirator bulb, place the tube into the water sleeve (two-inch opening to containment bag). By squeezing the bulb, fill the bag with visible smoke. Remove the smoke tube and twist the water sleeve closed. While holding the water sleeve tightly, gently squeeze the containment bag and look for smoke leaking out, especially at the top and ends of the containment bag. If leaks are found, they shall be taped closed using duct tape and the bag shall be re-tested;

(.7) insert the wand from the water sprayer through the water sleeve. Using duct tape, tape the water sleeve tightly around the wand to prevent leakage;

(.8) one person places their hands into the long-sleeved gloves while the second directs the water spray at the work;

(.9) if the section of pipe is covered with an aluminum jacket, this is removed first using wire cutters to cut any

bands and tin snips to remove the aluminum. It is important to fold the sharp edges in to prevent cutting the bag when it is placed in the bottom. A box may be put in the bottom of the bag with the tools placed in it, and the metal placed in the box to further protect the bag from being cut;

(.10) with the insulation exposed, using a bone saw, cut the insulation at each end of the section to be removed.

A bone saw is a serrated heavy-gauge wire with ring-type handles at each end. Throughout this process, water is sprayed on the cutting area to keep dust to a minimum;

(.11) once the ends are cut, the section of insulation should be slit from end to end using a utility knife. The cut should be made along the bottom of the pipe and water continuously supplied. Again, care should be taken when using the knife not to puncture the bag. Some insulation may have wire to be clipped as well. Again, a box may be used here as in subdivision (.9) above to protect the bag from puncture;

(.12) rinse all tools with water inside the bag and place back into pouch;

(.13) the insulation can now be lifted off the pipe and gently placed in the bottom of the bag, while the side of the insulation adjacent to the pipe is being thoroughly wetted;

(.14) using a scrub brush, rags, and water, scrub and wipe down the exposed pipe;

(.15) wet the doughnut-shaped pieces of wettable cloth over the exposed ends of insulation remaining on the pipe;

(.16) remove the water wand from the water sleeve and attach the small nozzle from the HEPA-filtered vacuum. Turn on the vacuum only briefly to collapse the bag;

(.17) remove the vacuum nozzle and twist the water sleeve closed and seal with duct tape;

(.18) from outside the bag, pull the tool pouch away from the back. Place duct tape over the twisted portion and then cut the tool bag from the containment bag, cutting through the twisted/taped section. In this manner, the contaminated tools may be placed directly into the next containment bag without cleaning. Alternatively, the tool pouch with the tools can be placed in a bucket of water, opened underwater, and the tools cleaned and dried without releasing asbestos into

the air. Rags and the scrub brush cannot be cleaned in this manner and should be discarded with the asbestos waste;

(.19) with removed insulation in the bottom of the bag, twist the bag several times and tape it to keep the material in the bottom during removal of the containment bag from the pipe;

(.20) slip a six (6)-mil disposal bag over the containment bag (still attached to the pipe). Remove the tape and open the top of the containment bag and fold it down into the disposal bag;

(.21) all surfaces in the work area shall be cleaned in accordance with Section VI.C.8. of these Regulations.

(.22) place any contaminated articles, debris, etc. into the bag with the waste;

(.23) twist the top of the bag closed, fold this over, and seal with duct tape. Place this bag into a second six (6)-mil disposable bag, and seal as in the above manner. Label the bag with a warning label;

(.24) asbestos material shall be disposed of in accordance with Section VI.C.7. of these Regulations; and

(.25) containment bags shall not be used on vertical sections of pipe.

4. Tent procedures

a. Tent procedures shall be used only for the purpose of fulfilling the conditions of Section VI.B.6. of these Regulations and are limited to the removal of less than one hundred sixty (160) square feet of asbestos material;

b. Tent procedures shall be accomplished in a constructed or commercially available plastic tent, plasticizing and sealing all surfaces not being abated within the tent periphery forming an enclosure. The tent shall be of six (6)-mil polyvinyl chloride at a minimum, with seams heat-sealed or double folded, stapled and taped air-tight and then taped flush with the adjacent tent wall. This is a single use barrier that shall not be reused once dismantled or collapsed;

c. Asbestos workers involved in the tent procedure shall wear two (2) disposable suits, including gloves, hood and footwear, and appropriate respiratory equipment if a decontamination unit is not contiguous to the tent;

d. The tent shall be attached to the substrate to produce an airtight seal except for a section large enough to allow for make-up air into the tent;

e. A HEPA vacuum or equivalent shall be used to continuously exhaust the enclosed area as specified under Section VI.B.20. of these Regulations, except that the negative air pressure in subdivision b. of that section shall be tested by smoke testing. The duct shall be attached securely and airtight through the tent wall at the most remote location possible from the asbestos material to be disturbed. A minimum of two (2) volume changes per hour is required;

f. Removal of asbestos material shall be by wet methods in accordance with Section VI.C.2. of these Regulations;

g. The removed asbestos material shall be carefully placed in plastic disposal bags and the bags handled in accordance with Section VI.C.7.c. of these Regulations;

h. Upon completion of abatement, and prior to tent collapse, the enclosed substrates shall:

(.1) be wet cleaned using clean rags, mops or sponges;
(.2) be permitted sufficient time to dry, prior to HEPA-vacuumping all substrates; and

(.3) be encapsulated to lockdown residual asbestos;

i. In the event of loss of negative pressure or barrier disturbance, the tent and the enclosed substrates shall be treated according to subdivision h. above;

j. The outer disposable suit shall be removed and remain in the tent upon exiting. Following tent disposal and work site cleanup the workers shall immediately proceed to a shower at the work site. The inner disposable suit and respirator shall be removed in the shower after appropriate wetting. The disposable clothing shall be disposed of as asbestos waste material. The workers shall then fully and vigorously shower with supplied liquid bath soap, shampoo, and clean, dry towels;

k. The HEPA vacuum shall be used to filter a minimum of six (6) volume changes through the tent prior to collapse of the tent/barrier; and

l. The tent shall be collapsed inward, enclosing the contaminated clothing. This contaminated material shall be disposed of in a plastic disposal bag. The vacuum shall be decontaminated and sealed.

5. Encapsulation Procedures

a. Encapsulation shall not be performed where:

(.1) asbestos material is friable and damaged, delaminated, or deteriorating;

(.2) effective long-term inspection of the encapsulated site cannot be assured;

(.3) the source of asbestos is readily accessible to

building occupants and damage to the asbestos material is probable;

(.4) the asbestos material does not adhere well to the substrate;

(.5) there is existing or potential water damage to asbestos material;

(.6) the asbestos material is more than one inch thick and is used to cover ceilings, walls, beams, or other structural members; or

(.7) the asbestos material is subject to high vibration;

b. If encapsulation is used as a method of asbestos abatement, the following maintenance procedures shall be employed:

(.1) a periodic monitoring and maintenance program, consisting of inspection at least annually to check for damage to all encapsulated surfaces;

(.2) maintenance of records by the building owner, on the location and condition of the encapsulated material; and

(.3) the removal of encapsulated asbestos when conditions change, indicating that the encapsulant no longer prevents the release of asbestos fibers;

c. Only encapsulants approved by the Department may be used to encapsulate asbestos materials; the Department shall maintain a list of Department-approved encapsulants;

d. Before encapsulation is performed, all loose asbestos material shall be dampened, removed while damp, and disposed of in accordance with Section VI.C.7. of these Regulations;

e. Material used to fill missing areas shall contain no asbestos, shall adhere well to the substrate, and shall provide an adequate base for the encapsulating agent;

f. Encapsulated asbestos materials shall be identified by signs, labels, color coding or some other mechanism prescribed by the Department to warn persons who may be required to disturb the material that asbestos is present, and such notification shall remain in place as long as the encapsulated asbestos material remains intact; and

g. Where encapsulants are sprayed on asbestos materials:

(.1) low pressure airless spray shall be used; and

(.2) negative air filtration units (with HEPA filters) shall be used during the encapsulation process which shall have sufficient capacity to cause one (1) complete air exchange every thirty (30) minutes.

6. Enclosure Procedures

a. The surface area of the asbestos material which will be

disturbed during the installation of hangers, brackets or other enclosure supports shall first be sprayed with amended water using a low-pressure airless spray;

b. Power drills used to install anchors or other tools which may disturb asbestos material shall be equipped with or used in conjunction with HEPA-vacuum systems;

c. Loose asbestos materials shall be removed while damp and disposed of in accordance with Section VI.C.7. of these Regulations;

d. After the installation of hangers, brackets or other supports and before the asbestos material is enclosed, asbestos-containing materials shall be repaired, using materials which do not contain asbestos;

e. Enclosures for asbestos materials shall be identified by signs, labels, color coding or some other mechanism approved by the Department to warn persons who may be required to disturb the enclosure, that asbestos is present; and

f. Enclosures shall be inspected at least annually to ensure their integrity.

7. Waste Disposal Procedures

a. As asbestos materials are removed, they shall be thoroughly wetted and placed into six (6)-mil plastic disposal bags;

b. Asbestos-contaminated materials such as plastic sheeting, clothing, and other items shall be placed into six (6)-mil plastic disposal bags;

c. Plastic disposal bags containing asbestos and asbestos-contaminated materials shall be sealed, cleaned, and, while being removed from the work area, placed into approved six (6)-mil plastic disposal bags, which shall be sealed, labeled, and transported directly to an approved waste disposal, storage, or transfer facility, in accordance with the applicable Pennsylvania Department of Environmental Resources, and EPA regulations;

d. Any asbestos-contaminated materials which may penetrate the asbestos disposal bags shall be placed into fiber drums, which shall be sealed and labeled in accordance with applicable EPA regulations;

e. There shall be no visible emission of asbestos dust during the transport of asbestos or asbestos-contaminated waste; and

f. Large structural or mechanical components may be removed with the attached asbestos material for disposal provided:

(.1) the component has been completely wrapped with two (2) layers of six (6)-mil polyethylene plastic and securely sealed with duct tape for transport to an

approved disposal facility; and

(2) the component has been cut away at places free of asbestos material. If there is no asbestos-free area to make the cut, the asbestos material shall be removed using the glove bag technique or equivalent, and the cut shall be made at the asbestos-cleared place.

8. Work Area Clean-Up Procedures

a. After all asbestos abatement work has been completed, but before the plasticizing is removed, wet wipe all surfaces in the work area to eliminate gross debris and then remove the top layer of plastic sheeting shall be HEPA vacuumed and, where feasible, wet cleaned with amended water. When surfaces have dried, they shall be HEPA vacuumed;

b. ~~After thorough cleaning, such that no visible residue remains, a~~ All surfaces within the work area from which asbestos material has been removed, and the bottom layer of all plastic sheeting shall be HEPA-vacuumed and sprayed, where feasible, wet cleaned with amended water; with an encapsulant; and

c. ~~The sequence of wet and dry cleaning shall be repeated in twenty four (24) hour intervals until the Certified Asbestos Project Inspector has determined that no residue is visible and, based on aggressive air monitoring conducted after all surfaces have dried, the airborne asbestos levels do not exceed the re-occupancy standard set forth in Section VI D.5. of these Regulations.~~ Following thorough cleaning, and after the Certified Asbestos Project Inspector has confirmed that the no visible residue remains, all surfaces in the work area from which asbestos has been removed and the bottom layer of plastic sheeting shall be sprayed where feasible with an encapsulant;

d. Clearance sampling shall be conducted in accordance with paragraph D.4.c. below after the bottom layer of plastic sheeting on walls, floors, and objects in the work area has dried and has been removed;

e. The sequence of wet and dry cleaning shall be repeated in twenty-four (24) hour intervals until the Certified Asbestos Project Inspector has determined that no residue is visible and, based on aggressive air monitoring conducted after all surfaces have dried, the airborne asbestos levels do not exceed the re-occupancy standard set forth in Section VI D.5. of these Regulations.

f. Critical barriers shall remain in place until the requirements of paragraph e. above has been satisfied.

9. Re-Insulation

No structural or mechanical surfaces from which asbestos has been removed shall be re-insulated with asbestos materials.

D. Air Monitoring

1. The independent certified asbestos project inspector shall monitor the level of airborne asbestos fibers on both the inside and outside of the asbestos abatement work area(s) by the collection of air samples before (Pre-test Samples), during (Project Samples) and after (Clearance Samples) the asbestos abatement project as specified in paragraph 4. below.

2. Air sampling and analysis for asbestos shall be conducted either according to the latest NIOSH methods for phase contrast microscopy (PCM) (Method 7400, NIOSH Manual of Analytical Methods) or transmission electron microscopy (TEM) (Method 7402, NIOSH Manual of Analytical Methods). Otherwise OSHA and EPA methods, or other methods approved by the Department, shall be employed. The applicable OSHA method for PCM is set forth in 29 CFR 1926.58, Appendix B. The applicable EPA method for TEM is set forth in 40 CFR 763, Subpart E, Appendix A.

3. Air samples shall be analyzed by an independent certified laboratory. Testing results shall be forwarded directly to the Department and to the independent certified asbestos project inspector and posted outside the work area so that they are readily accessible to asbestos workers and their authorized representatives.

4. The following types of samples of airborne asbestos fibers are to be collected by, or at the direction of, the independent certified asbestos project inspector:

a. Pre-Test Samples

The purpose of collecting pre-test air samples is to establish baseline levels of airborne asbestos fibers in those areas in which asbestos abatement work is to be conducted and in those areas immediately adjacent to the asbestos abatement work areas. Pre-test sample results are compared to project sample results to determine if asbestos has escaped from the asbestos abatement work areas;

(.1) for outdoor projects:

(.a) all pre-test air samples shall be collected and analyzed either by phase contrast microscopy (PCM) or transmission electron microscopy (TEM);

(.b) a sufficient number of pre-test air samples shall be collected to ensure that prevalent existing levels of airborne asbestos fibers have been characterized. A minimum of five samples

shall be taken within a distance of one hundred feet from the proposed abatement area in all directions (to the extent practicable);

(.c) all pre-test air samples shall be collected and analyzed before any asbestos abatement work begins and the results of the analyses shall be posted in a visible place, or maintained at the work site for easy review, throughout the course of the asbestos abatement action;

(2) for all other projects:

(.a) all pre-test air samples shall be collected and analyzed either by phase contrast microscopy (PCM) or transmission electron microscopy (TEM);

(.b) a sufficient number of pre-test air samples shall be collected to ensure that prevalent existing levels of airborne asbestos fibers have been characterized. A minimum of five samples shall be taken inside the proposed asbestos abatement work area and five samples shall be taken outside the proposed work area;

(.c) all pre-test air samples shall be collected before any asbestos abatement work begins under routine conditions of normal occupancy, wherever possible;

(.d) all pre-test air samples shall be analyzed before any asbestos abatement work begins, and the results of the analyses shall be posted in a visible place, or maintained at the work site for easy review, throughout the course of the asbestos abatement action;

(.e) the sampling zone for indoor air samples shall be representative of the building occupants' breathing zone; and

(.f) air samples shall not be taken in corners of rooms or near obstructions, such as furniture;

b. Project Samples

Project samples shall be collected during the asbestos abatement action to determine airborne concentrations of asbestos fibers (1) inside of the asbestos work areas or in the immediate vicinity of an outdoor abatement action in order to evaluate work practices, the level of necessary respiratory protection, and the risk of contamination posed to adjacent non-asbestos work

areas, and (2) outside of the asbestos abatement areas to ensure that asbestos fibers are not being released into "clean" areas as a result of the asbestos abatement action;

(.1) for outdoor projects:

(.a) all project samples shall be collected and analyzed either by phase contrast microscopy (PCM) or transmission electron microscopy (TEM);

(.b) project samples shall be taken within a distance of one hundred feet from the abatement area in all directions (as practicable) on a daily basis throughout the course of an asbestos abatement action. Samples shall be taken in sufficient quantity and at appropriate places so as to determine if airborne asbestos fibers are escaping from the abatement area into adjacent areas;

(.c) all project samples shall be analyzed within twenty-four (24) hours of their collection and the results shall be posted at or near the asbestos abatement area;

(.d) if, at any time during the course of the asbestos abatement work, airborne asbestos fiber concentrations determined by the project samples exceed the greater of either (1) the background concentration (as determined by statistical comparison of the project sample results with pre-test air sample results) or (2) one one-hundredth fibers per cubic centimeter of air (0.01 f/cc), the independent certified asbestos project inspector shall direct an immediate halt to all asbestos abatement work, require that corrective measures be undertaken to reduce airborne fiber concentrations in the immediate vicinity of the abatement action, and inform the Department immediately. Work shall not recommence until the source of the contamination has been identified and additional air samples have been collected indicating airborne fiber concentrations are below either one one-hundredth fibers per cubic centimeter (0.01 f/cc) or the background level;

(.2) for all other projects:

(.a) all project samples shall be collected and analyzed either by phase contrast microscopy(PCM) or transmission electron microscopy(TEM);

(.b) project samples shall be taken both inside and outside the asbestos abatement work area on a daily basis throughout the course of an asbestos abatement action;

(.c) project samples shall be collected from representative places throughout the work area;

(.d) project samples taken outside the asbestos abatement work area shall include:

(i) air samples from the clean room of the decontamination unit;

(ii) air samples outside of the asbestos abatement area in sufficient quantity and at appropriate places so as to determine if airborne asbestos fibers are escaping from the containment area(s) into adjacent non-asbestos work area(s);

(iii) air filtration unit exhaust, if there is a possibility that exhausted air may be conveyed into non-asbestos work area(s); and

(iv) other air samples as may be determined by the independent certified asbestos inspector;

(.e) all project samples shall be analyzed within twenty-four (24) hours of their collection and the results shall be posted at or near the asbestos abatement work area;

(.f) if, at any time during the course of the asbestos abatement work, airborne asbestos fiber concentrations determined by the project samples taken outside the asbestos abatement work area exceed the greater of either (1) the background concentration (as determined by statistical comparison of the project sample results with pre-test air sample results) or (2) one one-hundredth fibers per cubic centimeter of air (0.01 f/cc) outside of the work area, the independent certified asbestos project inspector shall direct an immediate halt to all asbestos abatement work, require that corrective

measures, such as misting the air, wet wiping, and/or HEPA vacuuming, be undertaken to reduce airborne fiber concentrations in the air outside the asbestos abatement work area, and inform the Department immediately. Work shall not recommence until the source of the contamination has been identified and additional air samples have been collected indicating airborne fiber concentrations outside the work area are below either one one-hundredth fibers per cubic centimeter (0.01 f/cc) or the background level;

c. Clearance Samples

The purpose of clearance samples is to determine if the asbestos abatement project was conducted in a proper manner so as to safely allow either (1) re-occupancy or (2) only that use necessary immediately prior to demolition. Clearance samples shall not be required for outdoor projects.

(.1) for projects prior to demolition (i.e. no re-occupancy):

(.a) all clearance samples shall be collected and analyzed either by phase contrast microscopy (PCM) or transmission electron microscopy (TEM);

(.b) clearance samples shall be collected after:

(i) the asbestos abatement contractor has completed all asbestos abatement and clean-up activities and ~~has so notified the independent certified asbestos project inspector~~ has certified that the work area has passed the visual inspection set forth in Section VI C.8. of these regulations. ;
and

~~(ii) the top layer of plastic sheeting on walls, floors, and objects in the work area has been thoroughly dried, has passed visual inspection tests by the independent certified asbestos inspector to a no-visible dust standard, and has been removed. Critical barriers shall remain in place until the clearance sampling and analysis is completed, and the results meet the clearance test criteria;~~

(.c) the minimum number of air samples which

shall be collected inside the asbestos abatement work area shall be based on the area of floor space as indicated below:

area of floor space, square feet	number of air samples
less than 5000	3
5000 or more	5

(.d) sampling sites in the abatement area shall be selected on a random basis to provide an unbiased and representative sample;

(.e) aggressive sampling conditions shall be used to circulate air in the vicinity of the air samplers with one twenty-inch fan used for each twenty thousand (20,000) cubic feet of work site;

(.f) the work area shall be considered cleared for that use necessary immediately prior to demolition when the concentration of asbestos does not exceed the limited use standard of five one-hundredths fibers per cubic centimeter of air (0.05 f/cc) based on the arithmetic average of those clearance air samples taken inside the asbestos abatement work area. If any part of the building is occupied during the course of the asbestos project this standard shall not apply; there-occupancy standard set forth in Section VI.D.5. of these Regulations shall apply;

(.2) for projects for which re-occupancy will follow:

(.a) all clearance samples shall be collected and analyzed by transmission electron microscopy(TEM), unless the asbestos project inspector certifies that an alternate analytic method provides adequate assurance that airborne asbestos levels will not exceed there-occupancy standard and the Department concurs therewith in writing;

(.b) clearance samples shall be collected after:

(i) the asbestos abatement contractor has completed all asbestos abatement and clean-up activities and ~~has so notified~~ the independent certified asbestos project inspector has certified that the work area

has passed the visual inspection set forth in Section VI C.8. of these regulations, † and

~~(ii) the top layer of plastic sheeting on walls, floors, and objects in the work area has been thoroughly dried, has passed visual inspection tests by the independent certified asbestos inspector to a no visible dust standard, and has been removed. Critical barriers shall remain in place until the clearance sampling and analysis is completed, and the results meet the clearance test criteria;~~

(c) the minimum number of air samples which shall be collected inside the asbestos abatement work area shall be based on the amount of asbestos removed, enclosed, or encapsulated as indicated below. The same number of "ambient" samples shall be collected concurrently outside of the asbestos abatement work area:

Amount of Asbestos	
Square feet	Linear feet
80 ** 100	40 ** 110
100 ** 130	110 ** 180
130 ** 160	180 ** 260
160 or more	260 or more

** - or more but less than

Minimum number of air samples

2
3
4
5

(d) asbestos abatement work area air samples shall be collected as follows:

(i) sampling sites in the abatement area shall be selected on a random basis to provide an unbiased and representative sample;

(ii) a field blank shall be taken at each abatement area before sampling is initiated by removing the cap for not more than thirty (30) seconds and replacing it at the time of sampling. Field blanks shall not be left open during the sampling period;

(iii) a sealed blank shall be carried with

patterns. Air samples shall be representative of any air entering the asbestos work area;

(ii) the ambient air samplers shall be located at least three (3) feet apart, and they shall be protected from adverse weather conditions;

(iii) unless otherwise indicated, five (5) air samples shall be taken to match the clearance sampling; and

(iv) a field blank shall be taken at the ambient air sampling site.

5. The re-occupancy standard shall be an airborne level of asbestos fibers inside the asbestos abatement work area of one one-hundredth fibers of asbestos per cubic centimeter of air (0.01 f/cc), as analyzed by Transmission Electron Microscopy (TEM) or by an alternative analytic method as provided for in Section VI.D.4.c.(1) of these Regulations.

a. the standard shall be considered met, when the geometric mean of the asbestos concentrations of air samples taken inside the work area is less than the appropriate value listed below:

Number of Air Samples taken inside the Asbestos Abatement work area	Geometric mean to pass (f/cc)
2	0.00393
3	0.00467
4	0.00517
5	0.00554

b. if the work area fails to meet the re-occupancy standard specified in subsection a. above, the standard shall be met when the average concentration of airborne asbestos fibers based on those air samples taken inside the asbestos abatement work area is not significantly different from the average asbestos concentration of the "ambient" samples collected at the same time outside the work area, as determined by the Z-test method found in 40 CFR 763, Subpart E., Appendix A.

E. Project Completion

In order to be considered a completed project each work area must pass a final inspection by meeting the conditions outlined below.

1. For projects for which re-occupancy will follow:

a. a building owner shall not permit an asbestos project work area, or any part of the building evacuated during an asbestos

project, to be reoccupied until the Department has certified, in writing, that the following conditions have been met:

(.1) the asbestos project inspector has certified that, based on a visual inspection, the area contains no visible dust or debris;

(.2) the asbestos project inspector has certified that, based on the results of the aggressive air monitoring procedures listed in Section VI.D.4.c.(2)(d)(iv) of these Regulations, the airborne asbestos level in the work area does not exceed the re-occupancy standard established by these Regulations;

(.3) the Department, based on a visual inspection, has determined that the area contains no visible dust or debris;

(.4) the Department has determined that the air monitoring required to establish that the re-occupancy standard has been met has been performed in accordance with applicable regulations and procedures; and

(.5) the asbestos contractor or supervisor has submitted an amended permit application for any project changes and evidence of the final, total cost of the asbestos abatement portion of the project, and has paid any incremental permit fee due.

2. For projects for which demolition will follow (i.e. no re-occupancy):

a. a building owner shall not permit an asbestos project work area, or any part of the building evacuated during an asbestos project, to be open for limited use until the Department has certified, in writing, that the following conditions have been met:

(.1) the asbestos project inspector has certified that, based on a visual inspection, the area contains no visible dust or debris;

(.2) the asbestos project inspector certifies that, based on the results of the aggressive air monitoring procedures listed in Section VI.D.4.c.(1)(e) of these Regulations, the airborne asbestos level in the work area does not exceed the limited use standard set forth in Section VI.D.4.c.(1)(f) of these Regulations;

(.3) the Department, based on a visual inspection, has determined that the area contains no visible dust or debris;

(.4) the Department has determined that the air monitoring required to establish that the limited use

standard has been met has been performed in accordance with applicable regulations and procedures; and

(.5) the asbestos contractor or supervisor has submitted an amended permit application for any project changes and evidence of the final, total cost of the asbestos abatement portion of the project, and has paid any incremental permit fee due.

3. For outdoor projects:

a. the asbestos project inspector has certified that, based on a visual inspection, the area contains no visible dust or debris;

b. the asbestos project inspector has certified that project samples taken on the final day of the project do not exceed the limits set forth in Section VI.D.4.b.(1)(d). If these limits are exceeded the project inspector shall make an evaluation of the cause, recommend remedial action and direct a re-test. This process shall continue until these limits have been met;

c. the Department, based upon a visual inspection, has determined that the area contains no visible dust or debris;

d. the Department has determined that the air monitoring required to establish that the final day's project samples meet appropriate limits has been performed in accordance with applicable regulations and procedures; and

e. the asbestos contractor or supervisor has submitted an amended permit application for any project changes and evidence of the final, total cost of the asbestos abatement portion of the project, and has paid any incremental permit fee due.

4. The Certified Asbestos Project Inspector shall within ten (10) days from the completion of the asbestos project submit a report containing the results of the final visual inspection and the laboratory report of the final clearance sampling.

F. Inspections

The asbestos contractor or supervisor shall make a request to the Department at least seventy-two (72) hours prior to the time when pre-inspections and final inspections are required.