

CITY OF PHILADELPHIA  
DEPARTMENT OF PUBLIC HEALTH  
BOARD OF HEALTH

**ASBESTOS CONTROL REGULATION**

Philadelphia Department of Public Health  
Air Management Services  
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Asbestos Control Regulation  
Page **1** of **70**

**ASBESTOS CONTROL REGULATION  
OF THE  
BOARD OF HEALTH  
CITY OF PHILADELPHIA, PENNSYLVANIA**

This Regulation is adopted pursuant to Title 6, Health Code, of the Philadelphia Code, specifically Chapter 6-600, Asbestos Projects, adopted June 26, 1986, which provides for the establishment of certain standards, procedures and other requirements for the removal, enclosure or encapsulation of asbestos or any other activity which disturbs or damages asbestos, under certain terms and conditions, through adoption of regulations by the Board of Health.

## TABLE OF CONTENTS

SECTION I. DEFINITIONS _____	4
SECTION II. LICENSES _____	11
SECTION III. PERMITS AND NOTIFICATIONS _____	12
SECTION IV. CERTIFICATION _____	14
SECTION V. TRAINING _____	20
SECTION VI. STANDARDS FOR MAJOR ASBESTOS PROJECTS _____	31
SECTION VII. STANDARDS FOR MINOR ASBESTOS PROJECTS _____	60
SECTION VIII. STANDARDS FOR SMALL ASBESTOS PROJECTS _____	65
SECTION IX. STANDARDS FOR INCIDENTAL ASBESTOS PROJECTS _____	66
SECTION X. ASBESTOS INSPECTIONS AND REPORTS _____	67
SECTION XI. EFFECTIVE DATE _____	70
SECTION XII. SEVERABILITY _____	70

**ASBESTOS CONTROL REGULATION  
OF THE  
BOARD OF HEALTH**

**SECTION I. DEFINITIONS**

- A. The following definitions apply to these Regulations:
1. *AGGRESSIVE SAMPLING* – A method of air sampling in which activity is simulated in the sample area by the use of mechanical equipment to stir up settled dust during the sampling period.
  2. *AIR MONITORING* – The process of sampling and measuring the fiber content of a known volume of air in a known period of time.
  3. *AIRLOCK* – A system for permitting the passage between a contaminated area and an uncontaminated area while restricting air movement and consisting of a curtained doorway having at least three (3) overlapping layers of plastic sheeting.
  4. *AMENDED WATER* – Water to which a surfactant has been added.
  5. ANSI. American National Standards Institute.
  6. *ASBESTOS* – Asbestiform varieties of chrysotile, crocidolite, amosite, actinolite, anthophyllite, and tremolite.
  7. *ASBESTOS ABATEMENT* – Any activity, such as the removal, enclosure, or encapsulation of asbestos materials, which is designed to control the release of asbestos fibers from asbestos materials and to prevent the exposure of humans to asbestos fibers.
  8. *ASBESTOS CONTRACTOR* – Any person who contracts to perform an asbestos project.
  9. *ASBESTOS INSPECTION REPORT* – A document prepared by an independent certified asbestos investigator concerning the presence and condition of asbestos material in a building.
  10. *ASBESTOS MATERIAL* – Any substance which contains more than one percent (1%) asbestos by weight.
  11. *ASBESTOS PROJECT* – Any activity involving the removal, enclosure, or encapsulation of asbestos materials or any renovation, repair or demolition which disturbs asbestos materials.
  12. *ASBESTOS PROJECT SUPERVISOR* – Any person employed by an asbestos contractor or building owner to supervise asbestos project activity.
  13. *ASBESTOS WORKER* – Any person who directly performs or supervises an asbestos project.
  14. *AUTHORIZED EMPLOYEE REPRESENTATIVE* – A person designated by the employees or the designated representative of an employee organization recognized or certified as the representative of the employees.

15. *BOARD* – Board of Health.
16. *BUILDING* – Any public or private commercial, industrial, or institutional structure or any residential structure which contains four (4) or more dwelling units.
17. *BUILDING OCCUPANTS* – Employees, tenants, or other persons who live, work or utilize the services offered in a building.
18. *BUILDING OWNER* – The owner of a building or his/her authorized representative.
19. *CERTIFIED ASBESTOS WORKER* – A person who has completed an approved training or review course and has received a training certificate.
20. *CFR* – Code of Federal Regulations.
21. *CLEAN ROOM* – An uncontaminated area or room which is part of the worker decontamination enclosure system with provisions for storage of workers' street clothes and protective equipment.
22. *COMMISSIONER* – Health Commissioner.
23. *CONTAINMENT BAG* – A plastic bag specifically signed to permit the removal of asbestos material without releasing asbestos fibers into the air.
24. *CRITICAL BARRIER* – Two (2) layers of plastic sheeting applied to openings occurring in a wall, the underside of ceiling construction, electrical outlets, non-removable lights, HVAC systems, windows, doorways, entranceways, ducts, grilles, grates, diffusers, floor drains, etc., that prevent the distribution of asbestos fibers to the surrounding area.
25. *DEMOLITION* – The taking out or wrecking of load-supporting structures in a building or private residence.
26. *DEPARTMENT* – Department of Public Health.
27. *DISCRIMINATORY ACTION* – Any action by an employer which adversely affects an employee with respect to any terms or conditions of employment or opportunity for promotion and which includes, but is not limited to, dismissal, layoff, suspension, demotion, transfer of job or location, reduction in wages, changes in hours of work, or reprimand.
28. *DISPOSAL BAG* – A transparent bag that when filled makes readily visible the contents of the bag.
29. *EM* – Electron microscopy.
30. *EMERGENCY SITUATION* – A condition requiring immediate removal or repair of less than eighty (80) square feet of friable asbestos material or less than twenty (20) linear feet of asbestos pipe covering where the failure to remove or repair such material would result in the shutting down of mechanical systems or manufacturing equipment.
31. *EMPLOYEE* – Any person permitted or suffered to work by an employer.

32. *EMPLOYER* – A public or private body, person, board, corporation, agency, institution, partnership, proprietorship, joint venture, fund, authority, or similar entity employing, permitting, or suffering another to work.
33. *ENCAPSULANT* – A material which can be applied to asbestos material to prevent the release of asbestos fibers from the material either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant).
34. *ENCAPSULATION* – The spraying or coating of exposed asbestos materials with an approved sealant to prevent the release of asbestos fibers.
35. *ENCLOSURE* – The erection of air-tight, impact-resistant barriers around asbestos materials to prevent the release of asbestos fibers into the environment.
36. *EPA* – United States Environmental Protection Agency.
37. *EQUIPMENT ROOM* – An area or room which is part of the worker decontamination enclosure system with provisions for the storage of contaminated clothing and equipment.
38. *FRIABLE ASBESTOS MATERIAL* – Any asbestos material that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure, including any asbestos material that will be crumbled, pulverized, or reduced to powder by the proposed asbestos project activity.
39. *HEPA* – A High Efficiency Particulate Absolute (Air) filter capable of filter efficiency at ninety-nine and ninety-seven one-hundredths percent (99.97%) of a test aerosol with an average particle size of three-tenths (0.3) microns.
40. *HVAC* – Heating, ventilation, and air conditioning.
41. *INCIDENTAL ASBESTOS PROJECT* – A project that disturbs or damages either: (a) five (5) square feet or less of friable asbestos material at one location or (b) one (1) linear foot or less of asbestos pipe covering at one location.
42. *INDEPENDENT CERTIFIED ASBESTOS INVESTIGATOR* – An individual approved by the Department of Public Health and employed or retained by a building owner to identify the presence and evaluate the condition of asbestos material in a building. An asbestos investigator shall not be associated with the contractor employed to perform the alteration or demolition work in the building.
43. *INDEPENDENT CERTIFIED ASBESTOS PROJECT INSPECTOR* – A technically qualified individual approved by the Department of Public Health and employed or retained by a building owner to perform continuous monitoring of a major asbestos project. An asbestos project inspector shall not be associated with the asbestos contractor on the project.

44. *INDEPENDENT CERTIFIED LABORATORY* – Any analytical testing laboratory approved by the Department of Public Health to analyze bulk, dust or air samples for asbestos. The laboratory utilized for analysis of samples from an asbestos project shall not be associated with the contractor performing the work on the asbestos project.
45. *INDUSTRIAL HYGIENE* – That science and art devoted to the recognition, evaluation and control of those environmental factors or stresses, arising in or from the workplace, which may cause sickness, impaired health and well-being, or significant discomfort and inefficiency among workers or among the citizens of the community.
46. *INDUSTRIAL HYGIENIST* – An individual having a college or university degree or degrees in Engineering, Chemistry, Physics, or Medicine or related Biological Sciences who, by virtue of special studies and training, has acquired competence in industrial hygiene. Such special studies and training must have been sufficient in all of the above cognate sciences to provide the abilities:
  - a. To recognize the environmental factors associated with the workplace and to understand their effect on workers and their well-being;
  - b. To evaluate, on the basis of experience and with the aid of quantitative measurement techniques, the magnitude of work-related stresses in terms of impact upon workers' health and well-being; and
  - c. To prescribe methods to eliminate, control or reduce such work-related stresses when necessary to alleviate their effects on workers.
47. *ISOLATION BARRIER* – A constructed partition that isolates the work area and is covered on the work side with two (2) layers of plastic sheeting so that it completely seals off the work area to prevent the distribution of asbestos fibers to the surrounding area.
48. *LICENSE* – A document issued by the Department of Censes and Inspections, after approval of the Department of Public Health, authorizing a contractor to engage in the business of asbestos abatement or renovation, repair, or demolition work involving asbestos materials.
49. *LIMITED USE STANDARD* – A maximum allowable concentration of airborne asbestos fibers established by the Department of Public Health for a building or portion thereof only for that use necessary prior to demolition.
50. *LOCATION* – Any work area in which an asbestos project is undertaken, except that where contiguous minor asbestos project work areas may be practicably combined for the purpose of meeting the standards for major asbestos projects, such combination of minor asbestos project work areas shall comprise one location.

51. *MAJOR ASBESTOS PROJECT* – Any project, except in a private residence, which involves, within one (1) year, the removal, enclosure, or encapsulation of or any renovation, repair, or demolition work which disturbs or damages either: (a) eighty (80) square feet or more of friable asbestos material from ceilings, walls, structural members, mechanical components, or other surfaces at one location; or (b) forty (40) linear feet or more of asbestos pipe covering at one location.
52. *MINOR ASBESTOS PROJECT* – Any project involving, within one (1) year, the removal, enclosure, or encapsulation of or any renovation, repair, or demolition work which disturbs or damages either:
  - a. more than twelve (12) square feet but less than eighty (80) square feet of friable asbestos material at one location; or
  - b. more than three (3) linear feet but less than forty (40) linear feet of asbestos pipe covering at one location; or
  - c. any asbestos project in a private residence involving more than twelve (12) square feet of friable asbestos material, or more than three (3) linear feet of asbestos pipe covering.
53. *NESHAPS* – National Emission Standards for Hazardous Air Pollutants as prescribed in 40 CFR Part 61.
54. *NIOSH* – National Institute for Occupational Safety and Health.
55. *OSHA* – United States Occupational Safety and Health Administration.
56. *PCM* – Phase contrast microscopy.
57. *PERMIT* – A document issued by the Department of Licenses and Inspections, after approval by the Department of Public Health, authorizing a contractor or any other person to commence a major asbestos project.
58. *PERSON* – Any individual, natural person, syndicate, association, partnership, firm, corporation, institution, trustee, agency, authority, department, bureau, or other legal entity.
59. *PLASTIC SHEETING* – Polyethylene sheeting of six (6)-mil thickness.
60. *PLASTICIZING* – The covering of all surfaces within a work area, which do not require asbestos abatement, with plastic sheeting.
61. *PRIVATE RESIDENCE* – Any private residential structure which contains less than four (4) dwelling units.
62. *REMOVAL* – The taking out or stripping of asbestos materials.
63. *RENOVATION* – Any modification of existing structures in a building or private residence.
64. *RE-OCCUPANCY STANDARD* – A maximum allowable concentration of airborne asbestos fibers established by the Department of Public Health for re-occupancy of a building, private residence, or portion thereof following completion of an asbestos project.



65. *REPAIR* – Restoration, reconstruction, or reconditioning of structures or fixtures in a building or private residence.
66. *SMALL ASBESTOS PROJECT* – Any project involving the removal, enclosure, or encapsulation of or any renovation, repair or demolition work which disturbs or damages either: (a) twelve (12) square feet or less but more than five (5) square feet of friable asbestos material at one location; or (b) three (3) linear feet or less but more than one (1) linear foot of asbestos pipe covering at one location.
67. *STRUCTURAL MEMBER* – Any load-supporting member of a structure, such as beams or load-supporting walls, or any non-load-supporting member of a structure, such as ceilings or non-supporting walls.
68. *SURFACING MATERIAL* – Material in a building that is sprayed-on, troweled-on, or otherwise applied to surfaces, such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, or other purposes.
69. *SURFACTANT* – A chemical wetting agent added to water to improve penetration.
70. *TECHNICALLY QUALIFIED INDIVIDUAL* – An individual with professional or technical education, training, or experience, who understands the health and safety risks associated with asbestos exposure and has a working knowledge of the precautions, procedures, and equipment required for proper asbestos removal, renovation, or demolition.
71. *THERMAL SYSTEM INSULATION* – Material in a building applied to pipes, fittings, boilers, breechings, tanks, ducts, or other interior structural components to prevent heat loss or gain, or water condensation, or for other purposes.
72. *WET CLEANING* – The removal of asbestos fibers from surfaces and objects using cloths, mops, or other cleaning tools which have been dampened with water.
73. *WETTABLE CLOTH* – A plaster-impregnated fiberglass webbing which is used in containment bag removal of asbestos pipe insulation to seal exposed ends of insulation remaining on pipe.
74. *WORK AREA* – Designated rooms, spaces, or areas where an asbestos project takes place and which are separated by isolation barriers from adjacent areas.
75. *WORKER DECONTAMINATION ENCLOSURE SYSTEM* – A system designed for the controlled ingress and egress of workers, authorized visitors, and other individuals between the work area and the non-work area consisting of a clean room, a shower room, and an equipment room and maintained separately by the use of airlocks.

## SECTION II. LICENSES

- A. No asbestos contractor shall engage in an asbestos project unless the contractor has obtained a license from the Department of Licenses and Inspections.
- B. In addition to the conditions set forth in Sections 6-503(1) and 6-602 of the Philadelphia Health Code for the issuance of licenses, the Department of Licenses and Inspections shall not issue a license authorizing any person to perform an asbestos project unless the Department has certified in writing that the applicant has complied with the following:
  - 1. Applicant shall submit an application for a license to the Department accompanied by the fees required pursuant to Section 6-602 of the Philadelphia Health Code;
  - 2. Applicant shall have a valid certification as an asbestos project supervisor or, where the contractor is a business, the business shall have in its employ at least one individual who has a valid certification as an asbestos project supervisor;
  - 3. Applicant shall certify that:
    - a. all worker protection equipment and all other equipment relating to asbestos abatement activities that are necessary to comply with the provisions of Chapter 6-600 and these Regulations will be used in asbestos abatement projects to be performed by the applicant;
    - b. all employees engaged in asbestos projects will have valid certifications as provided in Section IV of these Regulations. (The names, addresses, and certification numbers of all asbestos workers employed by the asbestos contractor shall be provided);
  - 4. Applicant shall submit a copy of written operating and employee-protection procedures to be followed by all employees engaged in an asbestos project; and
  - 5. Applicant shall submit copies of any and all citations or notices of violation of any federal, state, or local law or regulation relating to an asbestos project activity which has been issued to the applicant in any jurisdiction during the prior twelve months.
- C. All licenses shall:
  - 1. be valid for one (1) year from the date of issuance, unless suspended or revoked sooner as provided hereafter;
  - 2. be displayed publicly in a conspicuous place where the licensed activity is being conducted;
  - 3. be non-assignable and non-transferable; and\
  - 4. be conditioned upon continued compliance with the Health Code and the Regulations of the Board issued under it.

- D. The Department of Licenses and Inspections shall not renew a license unless the Department has certified, based upon an annual review of the licensee's record, in writing, that the licensee meets the conditions, qualifications, and standards established in these Regulations by the Board.
- E. The Department, whenever it determines that a licensee is not in compliance with the conditions of its license, shall certify such violation to the Department of Licenses and Section 6-503 of The Philadelphia Code.
- F. The Department of Licenses and Inspections, upon a finding by the Department that an asbestos contractor 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, a license in accordance with the certification of the Department. Suspension of a license shall not generate a license fee credit, and revocation will result in fee forfeiture.
- G. 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 the procedures prescribed by that Board. While an appeal from the suspension or revocation of any license is pending, such suspension or revocation shall nonetheless be effective if the Department certifies that the violation is willful or that continued operation constitutes a menace to the public health requiring immediate corrective action.

### **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 the fee required pursuant to Section 6-603 of The Philadelphia Health Code. The permit application shall include 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 hours; and
  - (.13) any other related information which the Department shall require;
- b. the applicant shall have a valid license issued by the Department of Licenses and Inspections pursuant to Section II of these Regulations;
  - c. the applicant shall include all appropriate information and/or notifications required under the federal asbestos NESHAP, 40 CFR 61.145; and
  - d. 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.
  4. The Department may, in its discretion, determine that the potential division of a major asbestos project into subparts would be consistent with the safety-based requirements of these regulations, such all or parts of the project may be treated as minor asbestos projects.

**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 certified in accordance with the requirements of Sections IV 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 and paying the fee required under Section 6-603 of The

Philadelphia Health Code. 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 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.

## **SECTION IV. CERTIFICATION**

A. Asbestos Workers Certification

1. No individual shall engage in an asbestos project 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 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:
    - 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 the fee required pursuant to Section 6-604 of The Philadelphia Health Code;
    - 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 successfully complete a Department-provided course for asbestos project inspectors, and achieve a passing grade on a Departmental examination;
  - g. the applicant shall certify that he/she will engage to perform on-site analyses only analytical testing laboratories certified by the Department; and
  - h. the applicant shall submit a description of his/her resources, laboratory affiliations, and the methods which he/she will employ to ensure 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 the fee required pursuant to Section 6-604 of The Philadelphia Health Code; and
    - b. the training certificate issued upon successful completion of a Department 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, as referenced in Section IV C.2.f., 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 the fee required pursuant to Section 6-604 of The Philadelphia Health Code;
  - 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 the fee required pursuant to Section 6-604 of The Philadelphia Health Code; and
    - b. the applicant shall submit the name and address of the laboratory, the name of the laboratory owner or his/her authorized representative and his/her telephone number;
    - c. for phase contrast microscopy (PCM) the laboratory shall have current accreditation by the American Industrial Hygiene Association (AIHA), or for individual microscopists, listing in the Asbestos Analysis Registry of the AIHA;
    - d. for transmission electron microscopy (TEM) the laboratory shall have current accreditation for TEM by the National Institute of Standards and Technology (NIST).
    - e. for bulk analysis the laboratory shall 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 findings 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 findings 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.

## **SECTION V. TRAINING**

- A. Asbestos contractors, asbestos project inspectors, asbestos project supervisors, asbestos workers, and asbestos investigators shall, as a requirement for licensing or certification, successfully complete asbestos training courses which have been

certified by the Department of Licenses and Inspections, with the approval of the Department.

B. Application For Certification.

The Department shall approve for annual certification applicant training programs that provide the material required in this paragraph and conform with the standards and criteria set forth below. The applicant shall notify the Department immediately of any significant changes in any information submitted. An applicant for certification of an asbestos abatement training program shall submit the following to the Department accompanied by an initial application fee of Twenty-Five Dollars (\$25) and an annual fee of Three Hundred Dollars (\$300):

1. The name and address of the agency, institution or private firm which plans to conduct the training course, and the name of the person responsible and his/her telephone number;
2. A description of course location, course schedule, including hours and dates, and course fees;
3. A description of the public outreach and publicity efforts which will be employed to inform potential attendees of the availability of the training courses;
4. A detailed outline of the course curriculum, including the topics set forth in Sections V.C.12. and/or V.C.13. of these Regulations below, the amount of time allotted to each topic, and the name of the instructor for each topic;
5. A description of the teaching methods to be used to present each topic including, where appropriate, lectures, discussions, demonstrations and audio-visual materials. When applicable, the name, producer, and date of production of audio-visual materials to be used shall be included;
6. Copies of written materials to be used in the training course;
7. Evidence demonstrates that the applicant employs enough instructors, not less than two, satisfy the education, experience and qualifications criteria as set forth below in paragraph C. below. Resumes describing special training, education and/or prior experience of the instructors may be submitted to the Department for the purpose of providing this evidence;
8. A list of the types, brand names, and quantities of respirators to be used to demonstrate fit tests or flow tests;
9. A description of the type and quantity of protective clothing to be used during practice exercises and demonstrations;
10. A description of the materials to be used for hands-on practice exercises and demonstrations, including hand tools, ladders, plastic sheeting and other

barrier construction supplies, negative air filtration units, water spray devices, and decontamination facilities;

11. A detailed description of the site of the training course, including the address of the site where demonstrations and hands-on practice exercises will be conducted;
12. Availability of bi-lingual instruction and the degree of literacy required for admission to the training course; and
13. Instructor-to-student ratio for the hands-on practice exercises and demonstrations.

C. Eligibility For Certification. In order to be eligible for certification of an asbestos abatement training program, an applicant shall demonstrate compliance with the standards and criteria set forth below:

1. The applicant shall use all training materials, evaluation forms, information, and audio-visual aids, which may be supplied or recommended by the Department;
2. The applicant shall send at least one course instructor to any meeting sponsored by the Department for the purpose of ensuring uniform and high quality training courses in asbestos abatement;
3. The applicant shall limit class size to not more than thirty (30) students, and the ratio of students to instructor for hands-on training shall be no more than ten to one (10:1);
4. The initial asbestos worker training course shall provide at least thirty-two (32) hours of instruction of which at least sixteen (16) hours are spent on actual experience in asbestos work practices through a simulated asbestos project and individual instruction and practice in the use and fit testing of respirators;
5. The asbestos worker review course shall provide at least eight (8) hours of review of topics covered in the initial training course, incorporating any new developments in asbestos abatement procedures and equipment;
6. The initial asbestos project supervisor course shall provide at least six hours of instruction in addition to the time requirements of 4. above.
7. The applicant shall inform the Department at least two weeks in advance of any asbestos abatement training or review course to be conducted by the applicant and shall permit representatives of the Department to attend, evaluate, and monitor any asbestos abatement training courses;
8. The applicant shall maintain a list of students trained through its program and the dates on which such training occurred;
9. The applicant shall issue a training certificate to persons who successfully complete an initial training or review course;

10. The successful completion of a training course shall include passage of a written examination approved by the Department or the equivalent, for those students who are unable to take a written examination;
11. Criteria For Staff and Instructors:
  - a. the applicant shall employ staff experienced in designing, implementing, and evaluating either employee educational programs in occupational health and safety or vocational education programs;
  - b. two or more course instructors shall be employed in order to ensure that all of the education and experience criteria for instructors set forth below are met:
    - (.1) those course sections that concern air monitoring, respiratory protection and personal protective equipment, and the relevant regulations of OSHA, EPA, and the Department shall be taught by either an industrial hygienist who is designated, at a minimum, as an Industrial Hygienist-in-Training (IHIT) by the American Board of Industrial Hygiene, or someone having the equivalent education and experience of an IHIT as determined by the Department;
    - (.2) those course sections that concern the health effects of asbestos shall be taught by a physician, a health educator, an industrial hygienist, or another health professional trained in the recognition and prevention of health hazards associated with exposure to asbestos;
    - (.3) those course sections that concern hands-on practice sessions shall be taught by either:
      - (.a) an individual who has been employed, for a minimum of one (1) year, as an asbestos abatement contractor or as an on-site foreman or supervisor of asbestos abatement workers. This person shall have had hands-on experience in all phases of asbestos abatement work, including work area preparation, construction of barriers, the use of personal protective equipment, engineering controls, work practices, clean-up, disposal and decontamination; or
      - (.b) an individual who has at least two (2) years of experience as an instructor at an asbestos abatement training facility and who has satisfactorily completed training at an EPA-or OSHA-endorsed course; or
      - (.c) an individual who has at least two (2) years of experience as an instructor in any industrial training

program with at least one (1) year of practical experience in asbestos abatement and who has satisfactorily completed training at an EPA-or OSHA-endorsed course.

12. Criteria For Topics In Asbestos Worker Training Courses:

a. the applicant shall design and conduct training courses which shall include, at a minimum, the following topics:

(.1) introduction:

(.a) goals of the training program;

(.b) requirements, procedures, and standards established in:

(i) the asbestos NESHAP by the U.S. Environmental Protection Agency, 40 CFR Part 61, subparts A and M; and

(ii) the Asbestos Control Regulations of the Board of Health of the City of Philadelphia;

(.c) history of asbestos use;

(.d) magnitude of asbestos problem;

(.2) recognition of asbestos:

(.a) types and physical characteristics of asbestos;

(.b) asbestos products and their end uses;

(.c) products where asbestos may be encountered; and

(.d) need for specific laboratory analyses to positively identify asbestos;

(.3) health effects of asbestos:

(.a) factors affecting asbestos-related disease development including: properties of asbestos, how asbestos enters the body (respiratory and digestive systems, abdominal and chest cavity), concentration and duration of exposure, critical dose, individual susceptibility and group susceptibility;

(.b) body defenses;

(.c) clinical signs of asbestos exposure based upon visible changes in x-rays, including plaques and asbestos bodies;

(.d) asbestos-related diseases: asbestosis, lung cancer, mesothelioma, and digestive system cancers, including definitions and the concepts of risk, latency, symptoms and diagnoses;

(.e) health risk to family members of asbestos workers; and



- (.f) effects of smoking and smoking cessation on asbestos-related disease rates;
- (.4) purposes and methods of asbestos monitoring and testing regarding the following:
  - (.a) bulk samples;
  - (.b) personal samples;
  - (.c) area samples;
  - (.d) sampling equipment demonstration: pumps, filters, calibration;
  - (.e) interpretation of analytical results;
  - (.f) permissible asbestos exposure limits established or recommended by OSHA, NIOSH, other agencies and professional organizations, and proposed changes;
  - (.g) OSHA regulations governing access to employee exposure and medical records;
- (.5) case studies, typical problems and corrective measures:
  - (.a) discussion of students' previous experiences with asbestos abatement operations;
  - (.b) presentation by course instructor(s) of problems which have actually occurred during asbestos abatement operations and how these problems have been resolved;
- (.6) introductions to abatement methods, removal, encapsulation, and enclosure, and to the principles of asbestos control which shall be applied to all asbestos application and abatement projects:
  - (.a) protection of the worker;
  - (.b) preparation of the workplace;
  - (.c) minimization of asbestos fiber release and work practices to minimize exposures;
  - (.d) clean-up and disposal; and
  - (.e) decontamination;
- (.7) protection of the Worker:
  - (.a) protective clothing: disposable and non-disposable; purpose; requirements; options; who must wear; donning, removal, storage, handling and disposal; and types, such as suits, booties, hoods, footwear, gloves, eye protection and hard hats;
  - (.b) respiratory protection: purpose; types of respirators; characteristics and limitations; choosing respirators; factors affecting fit (facial hair); fit testing; methods for

field testing; donning and removal; protection factors; inspection; cleaning; adjusting; use; storage; repair and replacement of parts;

(i) equipment:

(\*1) type "C" supplied air respirators, continuous flow or pressure demand class:

(\*a) description of physical characteristics; purpose limitations: components of the respirator, including the compressed air cylinders, and quality specifications for compressed air, low air alarm, pressure regulator, manifold, lines or hoses, belt-mounted regulator, breathing hose and facepiece; and

(\*b) demonstration and practice exercises in donning, using, flow testing and adjusting these respirators;

(\*2) Powered Air-Purifying Respirators (PAPR):

(\*a) description of physical characteristics; purpose; limitations; components of the respirator, including filters, battery, breathing hose and facepiece; and

(\*b) demonstration and practice exercises in donning, using, flow testing and adjusting these respirators;

(\*3) Air-Purifying Respirators:

(\*a) description of physical characteristics; limitations; components of the respirator, including full/half facepiece, filters and cartridges; and

- (\*b) demonstration and practice exercises in donning, using, fit testing and adjusting these respirators;
  - (\*c) Occupational Safety and Health Administration (OSHA) regulations, 29 CFR Part 1910.134, Respiratory Protection; and
  - (\*d) demonstration exercises of the above-named respirators, including fit testing or flow testing, wearing, adjusting, filter replacing and cleaning procedures. Each trainee shall have individually supervised personal practice using these procedures with at least one of the types of respirators listed in subdivision (.7)(b) above;
- (.8) special work practices to minimize exposure to asbestos fibers and health hazards;
- (.9) personal hygiene;
- (.10) general safety conditions:
  - (.a) heat stress;
  - (.b) fire safety;
  - (.c) emergency procedures to be followed in the event of fire and medical emergencies and the failure of containment barriers;
  - (.d) gas engines;
  - (.e) slips and falls;
  - (.f) scaffolding;
  - (.g) electrical hazards;
  - (.h) material handlings; and
  - (.i) negative air pressure systems and procedures;
- (.11) preparation of the work area:
  - (.a) care of occupants;
  - (.b) furniture and equipment-clean and remove movable furniture and equipment, and cover and seal unremovable equipment such as ductwork;

- (.c) ventilation and electric systems;
  - (.d) flooring;
  - (.e) enclosures: plastic sheeting for horizontal surfaces;
  - (.f) change area; and
  - (.g) signs;
- (.12) minimizing asbestos fibers in the air while disturbing and removing asbestos insulation:
- (.a) containment;
  - (.b) wetting and scraping;
  - (.c) vacuum cleaners equipped with High Efficiency Particulate Absolute (HEPA) Filters;
  - (.d) specialized tools; and
  - (.e) (promptly bagging asbestos debris, other housekeeping features;
- (.13) proper clean-up and disposal:
- (.a) clean-up, including techniques and sequence of activities; and
  - (.b) disposal, including bagging, drumming, storage and transport;
- (.14) decontamination:
- (.a) decontamination areas: clean room, shower room and equipment room;
  - (.b) direction of air flow; and
  - (.c) sequential steps;
- (.15) work practice demonstration:
- (.a) trainee shall participate in simulated on-the-job activities in the following subjects: suiting up in disposable full-body clothing; preparation of the work site; sealing off the work area; construction of a decontamination unit; various abatement techniques to include removal of asbestos; clean-up methods; material handling and disposal; and all other subjects included in subdivisions (.11) through (.14), inclusive, above. Each trainee shall wear a respirator during these activities. This respirator shall be one of those specified in Section V.C.12.a.(7)(b) of these Regulations; and
  - (.b) trainees shall demonstrate knowledge acquired from the entire course through participation in discussion groups and demonstrations; and
- (.16) review and course evaluation:

- (a) review;
  - (b) practice tests (optional); and
  - (c) evaluation of course by participants.
13. Criteria for Topics in Asbestos Project Supervisor and Asbestos Project Inspector Training Courses.

The course must include:

- a. all topics in Section V.C.12.of these Regulations.
- b. legal responsibilities and potential liabilities of various parties including, but not limited to, contractors, licensees, employers, employees, building owners, and suppliers.
- c. insurance and bonding.
- d. establishing a medical surveillance program.
- e. EPA and OSHA recordkeeping requirements.
- f. how to supervise effectively.
- g. additional emphasis on work practices, including the purpose, proper construction and maintenance of barrier and decontamination systems, posting of warning signs, electrical and ventilation system lock-out, proper working techniques for minimizing asbestos fiber release, use of wet methods and surfactants, use of negative pressure ventilation equipment, use and maintenance of HEPA vacuums, and proper clean-up and disposal procedures.

D. Criteria for Topics in Asbestos Investigator Course.

The course for asbestos investigators shall contain, at a minimum, fourteen (14) hours of instruction in the following topics:

- 1. The physical characteristics of asbestos including fiber size, aerodynamic properties, the recognition of types of asbestos and asbestos products; and the common applications for asbestos materials in buildings (minimum of one (1) hour).
- 2. The health hazards and effects of asbestos including asbestos-related diseases, routes of exposure, dose response relationships, clinical signs of asbestos exposure, synergistic relationship between asbestos exposure and cigarette smoking, and the health risk to family members (minimum of one (1) hour).
- 3. State-of-the-art personal protective equipment including: types of disposable and non-disposable clothing (e.g. suits, boots, head-covering, gloves); their requirements, purpose, selection, donning, removal, storage, handling and disposal; eye protection; hard hats and footwear (minimum of one-half (1/2) hour).

4. Respiratory protection (hands-on practice required) including the types, characteristics and limitations of respiratory classes; explanation of NIOSH approval (tested and certified); proper election, inspection, donning, cleaning and storage procedures for respirators; description of the physical characteristics, purpose, limitations, and components of the air-purifying respirator, including full-and half-face, filters and cartridges used during the collection of bulk samples; methods of field testing of the facepiece-to-face seal (positive and negative pressure fit test); and factors that alter the fit of air-purifying respirators (minimum of one and one-half (1 1/2) hours). Demonstration exercises of the air-purifying respirators shall include a qualitative or quantitative fit test.
5. Identification of homogeneous and heterogeneous sampling areas within the building, preparation of diagrams, selection of sampling locations, and the number of samples to be taken (minimum of one (1) hour).
6. The walk-through survey (hands-on practice required) including the visual inspection of all areas of the building including walls, ceilings, beams, ducts, etc.; identifying and distinguishing between different surfacing materials within the building which could have different asbestos contents; review of prior renovation and construction records kept by the owner (minimum of two (2) hours).
7. Proper methods of collecting bulk samples to minimize generation of airborne fibers (hands-on practice required). The methods shall include wetting of the surface material being sampled; proper use of sampling devices; packing, shipping, and labeling of containers for laboratory analysis; cleaning of the sampling area and the use of paint or a sealant to cover the spot where the sample was taken (minimum of two (2) hours). Students shall be appropriately suited in personal protective equipment for these procedures. All materials used for hands-on demonstrations shall be non-asbestos materials.
8. Interpretation of laboratory results including explanation of the differences between the varying types and percentages of asbestos in relation to its location in different areas of a building; description of laboratory analysis of bulk samples using polarized light microscopy; merits of the EPA bulk asbestos quality assurance program (minimum of one (1) hour).
9. Hazard assessment including basic considerations and methods used to recognize, evaluate, and control hazards based on the positive identification and condition of the asbestos material (minimum of one (1) hour).
10. Scope of OSHA, EPA, and Philadelphia asbestos regulations including air monitoring, medical monitoring, written respiratory protection programs, report writing and recordkeeping, and employee notification of exposures (minimum of one (1) hour).

11. A written examination consisting of a minimum of fifty (50) questions on the topics required in the above paragraphs (minimum of two (2) hours).
- E. 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.
- F. 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, or revoke such certification 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.
- G. 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 its procedures.

## **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;



- c. the partition shall be plasticized in accordance with paragraph 18. below; and
  - d. all accessible walls surrounding the area shall contain a minimum 18" square transparent viewing port made of shatterproof material greater than or equal to 0.125" in thickness located at a height appropriate for accessible viewing and in such a manner so as to maximize visibility of the work area. Viewing ports shall be maintained in a clear and unobstructed manner at all times.
- 6. Prior to the 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 HEPA-vacuumed before removal from the work ea. If the objects are disposed of as asbestos site 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 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 should 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 workplace 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) micro-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;
    1. where ducting to the outside is not possible, careful installation, smoke testing, air monitoring and daily inspections of ducting shall be performed to ensure 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 ensure that the asbestos nearest the substrate the asbestos material is thoroughly wetted to event 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 then 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 I.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, cut 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) only containment bags which are manufactured and designed to be used exclusively on vertical pipes shall 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 should 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 EPA-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 people 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.
- b. All surfaces within the work area from which asbestos material has been removed, and the bottom layer of plastic sheeting shall be

HEPA-vacuumed and where feasible, wet cleaned with amended water;

- c. Following thorough cleaning, and after the Certified Asbestos Project Inspector has confirmed that 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 Section VI.D.4.c. 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 independently certified laboratory. Testing results shall be forwarded directly to the Department and to the independently 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 be recommended 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 be recommended 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 electronmicroscopy (TEM);
  - (.b) clearance samples shall be collected after the asbestos abatement contractor has completed all asbestos abatement and clean-up activities and 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.

- (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 (feet <sup>2</sup> )	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 the asbestos abatement contractor has completed all asbestos abatement and clean-up activities and 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.

- (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:

<b>Amount of Asbestos/ft<sup>2</sup></b>	<b>Linear feet</b>	<b>Minimum number of air samples</b>
80 ** 100	40 ** 100	2
100 ** 130	110 ** 180	3
130 ** 160	180 ** 260	4
160 or more	260 or more	5

\*\* - or more but less than

- (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 each sample set; this representative cassette shall not be opened in the field; and
  - (iv) aggressive sampling conditions shall be used to dislodge any remaining dust in the asbestos abatement work area as follows:
    - (\*1) negative air filtration units shall remain on during the air monitoring period;
    - (\*2) prior to air monitoring, floors, ceilings and walls shall be swept with the exhaust of a one (1) horsepower leaf blower;
    - (\*3) stationary fans shall be placed on two (2) meter high stands in locations which will



not interfere with air monitoring equipment. Fan air shall be directed at ceiling and operated at low speed. One (1) fan shall be used for each ten thousand (10,000) cubic feet of work site;

(\*4) pump flow rates shall not exceed ten (10) liters per minute for twenty-five (25) millimeter cassettes; and

(\*5) the air volume sampled shall be sufficient to ensure an analytical sensitivity sufficient to measure the re-occupancy standard; and

(.e) asbestos abatement ambient air samples shall be collected as follows:

(i) ambient samplers shall be sited at places representative of the air entering the asbestos abatement work area. If make-up air entering the abatement area is drawn from another area of the building which is outside of the asbestos abatement work area, pumps shall be placed in this area. If no areas exist in the building and the air is drawn from outside the building, pumps shall be placed out of doors located near the building, and away from any obstructions that may influence wind 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 (f/cc) Abatement work area	Geometric means to pass
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

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 retest. 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 to the Department 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.

## **SECTION VII. STANDARDS FOR MINOR ASBESTOS PROJECTS**

A. Work Area Preparation

1. 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.
2. 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 concentration of

- asbestos may exceed ambient background levels. Caution signs shall be posted in English and other appropriate languages.
3. Building 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 by an airtight physical barrier, with the work area under negative pressure.
  4. Prior to plasticizing as required under paragraph 14. 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 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 14. 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.
  5. 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.
  6. An airlock shall be constructed at the entrance to the work area.
  7. 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 VII.A. of these Regulations, and (b) electrical and HVAC systems have been shutdown. 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.
  8. Emergency exits from the work areas shall be maintained, or alternative exits shall be established 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.
9. Entrances to the work area that will not be used for worker entry or emergency exits shall be locked to prevent unauthorized entry.
  10. Floor drains shall be sealed individually with two layers of plastic sheeting and tape, and then covered in accordance with paragraph 14. 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 14. below.
  11. Elevators running through the work area shall be shutdown, except as provided in subsection 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 shutdown 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 sheet 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 asbestos contractor.
  12. Heating, cooling, and ventilating air systems into or out of the work area shall be shutdown to prevent contamination and dispersal of asbestos fibers to other areas of the structure.
  13. 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 is 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 stationery and electrical equipment within the work area shall be adequately enclosed and ventilated.

14. 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.
15. Asbestos workers must have access to shower facilities after performing asbestos-related work activities, and a clean room for changing clothes.
16. A HEPA vacuum or equivalent shall be used to continuously exhaust the enclosed work area as specified in Section VI.B.20. of these Regulations except that (1) the negative air pressure in subdivision b. shall be demonstrated by smoke testing and (2) the minimum number of air changes referred to in subdivision f. shall be two (2) per hour.
17. Where there is no worker decontamination enclosure system contiguous with the work area, the workers shall wear protective equipment consistent with Section VI.C.4.c. of these Regulations and remove the equipment consistent with Section VI.C.4.j. of these Regulations.

B. Asbestos Project Procedures

1. General Procedures

- a. No person shall enter the work area without proper equipment, clothing, and training;
- b. The asbestos contractor or supervisor shall provide all authorized persons who enter the work area with the same protective clothing and equipment as is required for major asbestos projects and shall ensure that it is properly used;
- c. The asbestos contractor or supervisor shall ensure that all workers remove asbestos debris from clothing and equipment before leaving the work area; and
- d. The asbestos contractor or supervisor shall ensure that appropriate air monitoring to determine worker exposure shall be conducted for asbestos workers not covered by the OSHA Asbestos Standard.

2. Removal Procedures

The asbestos contractor or supervisor shall ensure that all removal, enclosure, encapsulation, waste disposal, work area clean-up, and re-insulation procedures required for major asbestos projects as provided in Section VI.C.2. through Section VI.C.9., inclusive, of these Regulations are followed.

C. Air Monitoring

1. 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.

2. Air samples shall be analyzed by an independently certified laboratory by appropriate analytic methods.
3. Siting of air monitoring samplers:
  - a. the sampling zone for indoor air samples shall be representative of the building occupants' breathing zone;
  - b. if possible, outdoor ambient and baseline samplers should be placed about six (6) feet above the ground surface in reasonable proximity of the building and away from obstructions and drafts that may unduly affect airflow. For outdoor samples, if access to electricity and concerns about security dictate a rooftop site, locations near vents and other structures on the roof which would unduly affect airflow shall be avoided;
  - c. air sampling equipment shall not be placed in corners of rooms or near obstructions such as furniture; and
  - d. ambient clearance samplers shall be sited according to Section VI.D.4.c.(2)(e) of these Regulations.
4. Air samples shall be taken before, during, and after asbestos abatement as follows:
  - a. three (3) initial samples shall be taken before asbestos abatement begins to establish prevalent airborne levels;
  - b. project samples shall be taken inside and outside the work area on a daily basis while asbestos abatement is occurring to monitor the work area and detect any escape of fibers; and
  - c. clearance samples shall be taken according to Section VI.D.4.c of these Regulations. Either PCM or TEM may be used for analysis.
5. The asbestos contractor or supervisor shall immediately halt asbestos work and implement appropriate remedial measures if air testing results show any increase in airborne asbestos levels outside the work area which exceeds the standard set forth for major asbestos projects in Section VI.D.4.b.(2)(f) of these Regulations.
6. The re-occupancy standard shall be an airborne asbestos level of one one-hundredth (0.01) fibers per cubic centimeter of air or the ambient level as measured by the same method, whichever is greater. If necessary, comparison with the ambient level will be in accordance with Section VI.D.5.b. of these



Regulations. After clean-up, the asbestos project work area, including any part of the building evacuated during an asbestos project, shall not be unsealed or reoccupied until the re-occupancy standard has been met.

D. Project Completion

1. The asbestos project work area, including any part of the building evacuated during an asbestos project, shall not be unsealed or re-occupied until the contractor or supervisor certifies that:
  - a. based on a visual inspection, the area contains no visible dust or debris; and
  - b. 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 area does not exceed the re-occupancy standard established by the Department.

## **SECTION VIII. STANDARDS FOR SMALL ASBESTOS PROJECTS**

A. Work Area Preparation

1. Appropriate caution signs shall be posted at all entrances to the asbestos project work area and the waste storage area at all times during the asbestos project until the re-occupancy standard has been met.
2. All furniture, equipment, fixtures, and other movable objects shall be HEPA-vacuumed and, where feasible, wet-cleaned and removed from the work area.
3. All other objects that cannot be removed shall be HEPA-vacuumed and, where feasible, wet-cleaned and covered with plastic sheeting taped in place.
4. A sealable barrier of plastic sheeting shall be constructed at the entrance to the work area.
5. All ventilation systems into and out of the work area shall be covered with plastic sheeting taped in place.
6. Occupants shall be removed from any floor where an asbestos project is in progress unless the work area is completely enclosed and sealed off from other areas.

B. Asbestos Project Procedures

All asbestos project procedures shall conform with the provisions of Section VII.B. of these Regulations.

C. Air Monitoring

1. 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.

2. Air samples shall be analyzed by an independently certified laboratory using appropriate analytical methods.
3. Clearance samples shall be taken to determine if the re-occupancy standard has been met as follows:
  - a. the clearance samples shall be taken after all asbestos abatement and clean-up activities have been completed but before the critical barriers are removed; and
  - b. two (2) samples shall be taken within each work area using aggressive sampling as follows:
    - (.1) sweep floors briskly with a broom immediately before sampling;
    - (.2) operate one ten (10) inch oscillating fan within twenty (20) feet of each sampler;
    - (.3) locate each sampler within five (5) feet of the asbestos abatement activity;
    - (.4) pump flow rates of up to ten (10) liters per minute may be used for twenty-five (25) millimeter cassettes; and
    - (.5) the air volume sampled shall be sufficient to sure the minimum quantification limits.

## **SECTION IX. STANDARDS FOR INCIDENTAL ASBESTOS PROJECTS**

### **A. Site Preparation**

1. Appropriate caution signs shall be posted at all entrances to the asbestos project site and the waste storage area at all times during the asbestos project.
2. All surfaces having the potential to become contaminated shall be covered with plastic sheeting.
3. All ventilation intakes within ten (10) feet of the project site shall either be shut down or sealed with plastic sheeting.
4. Occupants shall be removed from any room where the incidental asbestos project is in progress.

### **B. Asbestos Project Procedures**

1. General procedures

- a. no person shall perform or assist in an incidental asbestos project without wearing proper protective equipment and clothing; and
  - b. all asbestos debris must be removed from clothing and equipment before the worker leaves the project site.
2. Other procedures
- a. asbestos pipe covering shall be removed by containment bag techniques;
  - b. asbestos materials shall be thoroughly wetted with an appropriate wetting solution before being removed;
  - c. cutting, sawing, or other similar operations on asbestos materials shall be performed in conjunction with a HEPA vacuum system;
  - d. all encapsulation, waste disposal, and reinsulation procedures required for major asbestos projects shall be followed; and
  - e. the project site shall be HEPA-vacuumed or wet-cleaned such that no visible residue remains.

## **SECTION X. ASBESTOS INSPECTIONS AND REPORTS**

### **A. General.**

1. An asbestos inspection report including all laboratory sample reports and analyses shall be required prior to the issuance of a permit for demolition or alteration. This does not apply to buildings for which a building permit was issued after December 31, 1980 or any residence with three (3) dwelling units or less. For the purpose of these Regulations asbestos inspections shall be made only by an independent certified asbestos investigator.
2. A copy of the asbestos inspection report shall be provided to each contractor involved in the project for which the building permit was applied and shall be made available to all contractor employees working on the project.

### **B. Asbestos Inspection.**

In conducting an asbestos inspection of the area affected by the proposed work the independent certified asbestos investigator shall:

1. Visually inspect and identify the locations of all surfacing material, thermal system insulation, and miscellaneous material known or suspected to be asbestos material;
2. Determine if material known or suspected to be asbestos material is friable (i.e. able to be crumbled, pulverized, or reduced to powder by hand pressure when dry, or which will crumbled, pulverized, or reduced to powder by the proposed work) or non-friable;

3. Identify all homogeneous areas (i.e. areas uniform in color and texture) of friable and non-friable suspected asbestos material;
4. Determine the condition of known or suspected asbestos material and classify in three categories as follows:
  - a. type of material-known or suspected asbestos material
  - b. physical state-friable or non-friable
  - c. condition-damaged (or deteriorated or delaminated) or non-damaged;
5. Collect and submit for analysis bulk samples of friable suspected asbestos material in accordance with paragraph C. below and;
6. Attach warning signs immediately adjacent to any known or suspected asbestos material which is either friable or non-friable as follows:
  - a. the warning labels shall read in print which is readily visible because of large size or bright color: **CAUTION/ASBESTOS: DO NOT DISTURB WITHOUT PROPER TRAINING AND EQUIPMENT**
  - b. all labels shall be prominently displayed in readily visible locations and shall remain posted until the project is completed, or the asbestos material is removed.

C. Sampling Techniques.

1. Samples of surfacing material which is suspected to be asbestos material and is friable shall be collected in a random manner that is representative of the area affected by the proposed work as follows:
  - a. a minimum of three (3) bulk samples shall be collected from each homogeneous area as outlined in paragraph B. above that is one thousand (1000) square feet or less;
  - b. a minimum of five (5) bulk samples shall be collected from each homogeneous area as outlined in paragraph B. above that is greater than one thousand (1000) square feet but less than or equal to five thousand (5000) square feet;
  - c. a minimum of seven (7) bulk samples shall be collected from each homogeneous area as outlined in paragraph B. above that is greater than five thousand (5000) square feet;
2. Samples of thermal system insulation which is suspected to be asbestos material and is friable shall be collected in a random manner that is representative of the area affected by the proposed work as follows:
  - a. a minimum of three (3) bulk samples shall be collected from each homogeneous area as outlined in paragraph B. above;
  - b. a minimum of one (1) bulk sample shall be collected from each homogeneous area as outlined in paragraph B. above which has been

patched if the patched section is less than six (6) linear feet or square feet; and

- c. sufficient bulk samples shall be collected from each insulated mechanical system where cement or plaster is used on fittings such as tees, elbows, or valves unless it has been determined that such insulation is fiberglass, foam glass, rubber, or other non-asbestos material;

3. Samples of miscellaneous material which is suspected to be asbestos material and is friable shall be collected in a random manner that is representative of the area affected by the proposed work.

D. Analysis.

1. All bulk samples collected under paragraph C. above shall be analyzed for asbestos content by laboratories certified by the Department according to Section IV.E. of these Regulations;
2. Bulk samples shall not be composited for analysis and shall be analyzed by polarized light microscopy; and
3. A homogeneous area shall be determined to be asbestos material if at least one sample collected from that area contains more than one percent (1%) asbestos.

E. Reporting.

1. The asbestos inspection report shall contain the following information:
  - a. name of building;
  - b. address of building;
  - c. name and phone number of building owner;
  - d. name, business address, and phone number of independent certified asbestos investigator;
  - e. location, amount, and classification (as outlined in Section X.B.4. of these Regulations) of all known or suspected asbestos material which will be affected by the proposed work;
  - f. date samples were collected; and
  - g. name and address of the certified analytical laboratory which analyzed the samples.

## **SECTION XI. EFFECTIVE DATE**

Except as otherwise provided this Regulation shall become effective upon adoption.

## **SECTION XII. SEVERABILITY**

The provisions of this Regulation are severable. If any provision or part thereof is held to be unenforceable, the remaining provisions or parts thereof shall remain in effect. It is hereby declared to be the intent of the Board that this Regulation would have been adopted if the unenforceable provision or part had not been included.