ENVIRONMENTAL SERVICES, LLC

GENERAL ASBESTOS REMOVAL SPECIFICATIONS

Prepared for

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GENERAL ASBESTOS REMOVAL SPECIFICATIONS

INTRODUCTION

These specifications are necessarily general and are intended only to give a general description of what is required to adequately complete asbestos abatement projects for the School Board of Brevard County (SBBC). Each asbestos abatement project is accompanied by a job-specific Request for Proposal (RFP) issued by SBBC, which summarizes the extent and nature of the asbestos removal or abatement. These specifications are not intended to cover all variations that may occur, however, the RFP will address anticipated variations.

TERMS AND DEFINITIONS

The following section is a list of terms and definitions that will be used in this specification.

Abatement: Procedures to control fiber release from ACM. Includes encapsulation, enclosure and removal.

Accredited: A person who holds a current certificate of training or updated certificate of continuing training as required by Florida Statute 455.301 - 455.308.

AHERA: The Asbestos Hazard Emergency Response Act of 1986, also referred to as the Asbestos-Containing Materials in Schools; Final Rule and Notice, and 40 CFR Part 763

Asbestos-Containing Building Material (ACBM): Surfacing ACM, thermal system insulation ACM, or miscellaneous ACM that is found in or on interior structural members or other parts of a building.

Asbestos-Containing Material (ACM): Any material or product that contains more than one percent asbestos as determined by PLM analysis, or assumed to contain greater than one percent asbestos.

Airlock: A system for permitting ingress or egress without permitting air movement between a contaminated area and an uncontaminated area, typically consisting of two curtained doorways at least 6 feet apart.

Air Monitoring: The process of measuring the fiber content of a specific volume of air in a stated period of time in an appropriate location.

Amended Water: Water to which a surfactant has been added.

Authorized Visitor: Owner, Consultant, or representative of any regulatory or other agency having jurisdiction over the project.

Clean Room: An uncontaminated area or room that is part of the worker decontamination unit, with provisions for storage of uncontaminated clothing and equipment.

Confined Space: A space that is large meets all three of the following requirements:

- Is large enough and so configured that an employee can bodily enter and perform assigned work.

- Has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry).

- Is not designed for continuous employee occupancy.

Consultant: An asbestos consulting company and its employees retained by Owner, which employs a full-time consultant who is licensed in the State of Florida to provide asbestos consulting services, and whose employees hold current applicable accreditation.

Containment: The temporary, polyethylene-lined, enclosure structure erected to control the release of asbestos fibers to the ambient environment.

Contractor: An asbestos abatement contracting company and its employees, which employs a full-time Contractor who is licensed in the State of Florida to provide asbestos abatement services, and whose employees hold current applicable accreditation.

Critical Barrier: A physical barrier that seals openings to the contaminated work area in such a way that airborne contaminants can not be released to uncontaminated areas.

Curtained Doorway: A device to allow entry or exit from one room to another while permitting minimal air movement between the two rooms, typically constructed by placing two overlapping sheets of polyethylene over an existing or temporary framed doorway, securing the vertical edge of one sheet along one vertical side of the doorway, and securing the vertical edge of the other sheet along the opposite vertical side of the doorway.

Decontamination Unit: A series of connected rooms, each room being an airlock, with curtained doorways between any two adjacent rooms, for the decontamination of workers or of materials and equipment.

Demolition: The wrecking of taking out of any load-supporting structural member and any related razing, removing, or stripping of asbestos products.

Encapsulant : A liquid material that can be applied to ACM or surfaces stripped of ACM and that controls the possible 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). When used, care must be taken that any re-insulation material will adhere to the encapsulant.

Encapsulation: All herein specified procedures necessary to coat surfaces from which ACM has been removed with sealing substance meeting applicable government standards. Encapsulation may also be referred to as "lock-down" encapsulation.

Equipment Decontamination Unit: A decontamination unit for materials and equipment, typically consisting of a designated area of the work area, a washroom, holding area, and an uncontaminated area.
Equipment Room: A contaminated area or room that is part of the worker decontamination unit, with provisions for storage of contaminated clothing and equipment.

Friable ACM: Asbestos-containing material that can be crumbled, or reduced to a powder by ordinary hand pressure or materials assessed as friable by an accredited asbestos abatement inspector.

Fixed Object: A piece of equipment or furniture in the work area that cannot be removed from the work area.

HEPA Filter: A High Efficiency Particulate Air (HEPA) filter that traps and retains at least 99.97% of monodispersed particles 0.3 microns in diameter or larger.

HEPA-Filtered Exhaust Unit: An exhaust fan that draws contaminated air through a HEPA filter and exhausts the filtered air to the outside of the building.

HEPA-Filtered Vacuum: High efficiency particulate air filtered vacuuming equipment with a filter system that collects and retains 99.97% of monodispersed particles 0.3 microns in diameter or larger.

Holding Area: A room between the washroom and an uncontaminated area in the equipment decontamination unit. The holding area has an airlock constructed at its entrance from an uncontaminated area.

Lockout: The placement of a lockout device on an energy isolating device, in accordance with an established procedure, ensuring that the energy-isolating device and the equipment being controlled cannot be operated until the lockout device is removed.

Lockout Device: A device that utilizes a positive means such as lock, either key or combination type, to hold an energy-isolating device in the safe position and prevent the energizing of a machine or equipment. Included are blank flanges and bolted slip blinds.

Moveable Object: A piece of equipment or furniture in the work area that can be removed from the work area.

Nonfriable ACM: Asbestos-containing material that does not crumble, or become reduced to powder by ordinary hand pressure, or material that has been assessed as nonfriable by an accredited asbestos abatement inspector.

Owner: School Board of Brevard County (SBBC) or its employees or agents.

PACM: Presumed Asbestos-Containing Material.

Presumed Asbestos-Containing Material: Thermal system insulation and surfacing material found in buildings constructed no later than 1980.

Pressure Differential: A condition whereby the containment is maintained at a pressure differential of at least minus 0.02 inches of water relative to the adjacent unsealed areas.

Removal: All herein specified procedures necessary to strip all ACM from the designated areas and dispose of these materials at an acceptable site.
Renovation: The modifying of any existing structure, or portion (component) thereof.

Shower Room: A room in the worker decontamination unit that is located between the clean room and equipment room, and is equipped with a functional shower stall and waste water filtering system.

Surfactant: A non-toxic, non-flammable, chemical wetting agent added to water to improve

penetration, thus reducing the quantity of water required for a given operation or area.

Supervisor: An employee of Contractor who is accredited as a Supervisor for Asbestos Abatement Projects, qualifies as a competent person on asbestos abatement projects, and holds current applicable accreditation.

Tagout: The placement of a tagout device on an energy-isolating device, in accordance with an established procedure, to indicate that the energy-isolating device and the equipment being controlled may not be operated until the tagout device is removed.

Tagout Device: A prominent warning device, such as a tag and a means of attachment, which can be securely fastened to an energy-isolating device in accordance with an established procedure, to indicate that the energy-isolating device and the equipment being controlled may not be operated until the tagout device is removed.

Washroom: A room between the work area and the holding area in the equipment decontamination unit. The washroom has an airlock between it and the holding area.

Wet-Clean: The process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning tools that have been dampened with amended water, and by afterwards disposing of these cleaning tools as asbestos-containing waste.

Work Area: The area of a building where asbestos-containing materials will be, or are being, removed or abated.

Worker Decontamination Unit: A decontamination enclosure system for workers, typically consisting of a clean room, a shower room, and an equipment room.

SECTION 1.00 GENERAL REQUIREMENTS

PART 1.0 DESCRIPTION OF WORK AND CONTRACTOR RESPONSIBILITIES

This specification covers removal and disposal of materials previously identified as Asbestos-Containing Material (ACM) in independently prepared bulk material analysis reports, and removal and disposal of related materials in the subject building.

1.1.1 Description of Work

A. The work is, in general terms: Provide all labor, equipment, materials, supervision, and subcontracting for the removal and disposal of all ACM as specified in the Request for Proposal (RFP) issued by SBBC for each specific asbestos abatement job and building that is owned, leased, or operated by SBBC. This includes all asbestos-containing debris, dust, or asbestos-contaminated materials.

B. Special note is given to the combination of interior demolition with removal and disposal of ACM. ACM encountered during demolition shall be left intact and removed and disposed of under controlled conditions as ACM.

C. This specification covers removal and disposal of ACM and all materials that may have been contaminated during decay or disruption of ACM either prior to or during Contractor's work.

D. The procedures for removal of the following asbestos-containing materials are contained in this general specification:

1. Friable Asbestos-Containing Materials: Friable ACM is defined as any material known to contain greater than one percent asbestos, and can be crumbled, or reduced to a powder by simple hand pressure, or has been assessed as a friable material by an accredited asbestos abatement inspector.

2. Nonfriable Asbestos-Containing Materials: Nonfriable ACM is defined as any material known to contain greater than one percent asbestos, and can not be crumbled, or reduced to a powder by simple hand pressure, or has been assessed as a nonfriable material by an accredited inspector.

3. Asbestos-Containing Mastic Materials: These materials are defined as any asphalt-based, or coal tar-based material known to contain greater than one percent asbestos, have an adhesive quality, and are not likely to become friable during asbestos removal operations.

4. Other Asbestos-Containing Materials: A section of this specification addresses special procedures that may be employed when removing ACM. The Special Procedures Section includes procedures for:

    a. Exterior, Nonfriable ACM: Specifically Asbestos-Containing Roofing Materials and asbestos cement panels.

    b. Glove Bag Procedure: This procedure is to be utilized for small-scale, short-duration work only or when authorized by Consultant and SBBC.
    c. Mini-Containment Procedure: Certain abatement tasks may utilize this procedure only when authorized by Consultant and SBBC.

d. Decontamination of Contaminated Areas: This procedure will apply only when contamination of an area of in a building has occurred, and emergency decontamination must be performed.

5. When work areas include both friable and nonfriable types of ACM, Contractor shall prepare work area using procedures for friable asbestos removal.

E. The following asbestos-containing materials shall be removed and disposed of:

1. All materials identified in the RFP issued by SBBC.

2. All materials that have accumulated from installation, decay, or disruption of any ACM.

3. All other materials in removal area must be thoroughly cleaned and sealed in 2 layers of 6 mil fire-retardant polyethylene sheeting, or removed prior to disturbance of ACM.

F. Related Work

1. Related work includes all work necessary for successful completion of removal and disposal of ACM but not directly involving ACM. This work includes but is not limited to:

a. Protection of the building and property in the building from work related damage.

b. Proper cleaning and/or disposal of contaminated and non-contaminated materials.

2. Related work includes the maintenance of daily work logs by Contractor on the job site. These work logs shall be supplied to Contractor by Consultant and must include:

a. The name each person, and description of type of respiratory protection worn by each person entering containment or work area.

b. Descriptions of meetings or discussions regarding the job, special or unusual events, records of daily containment inspections, records of waste removal from containment, the chart from the recording manometer, and air monitoring results.

c. A copy of this log, signed by Supervisor must be submitted to Consultant at the end of the project as a condition for completion.

G. The project shall be termed complete and Contractor released upon satisfaction of all terms and conditions of this specification.

H. Work Schedule

Upon receipt of notification to proceed with this project by SBBC, Contractor must file all notices to the applicable regulatory agencies, and obtain all required permits to perform asbestos abatement in Brevard County, Florida. Contractor must submit to SBBC a copy of the notification of intent to renovate or demolish. Upon commencement of work, Contractor must complete the project within the time specified in the RFP.

1.1.2 Contractor Responsibilities

A. Contractor represents that Contractor and its employees are experts in asbestos removal with full knowledge of, and compliance with, all applicable Federal, State, and Local rules, regulations, and guidelines governing asbestos removal as well as state-of-the-art removal techniques.

B. Contractor must furnish all permits, labor, material, services, insurance, tools, equipment, and notifications in accordance with EPA, OSHA, Florida DEP., and all other applicable agencies to complete removal of ACM.

C. Prior to beginning an asbestos abatement project, Contractor shall attend a pre-construction meeting to be held at a mutually agreeable time and date. Attending this meeting will be SBBC (including local shop or work area representative), Contractor, Supervisor, and Consultant.

1. Contractor shall be prepared to discuss and submit plans or documentation for:

    a. Preparation of work area
    b. Personal protective equipment
    c. Historical air monitoring data that shows levels of airborne fibers on similar jobs in the past
    d. Employee training certificates
    e. Decontamination procedures
    f. Abatement methods and procedures
    g. Handling and disposal procedures for ACM
    h. Final decontamination and cleanup procedures
    i. Sequence and schedule of work
    j. Procedures for maintaining containment during power failures
    k. Emergency procedures
    l. Respiratory Protection Program including evidence of respiratory protection training and current respirator fit tests.
    m. Safety requirement
    n. Any site-specific SBBC requirements

2. There will be a final walk-through of the work area(s) within the building(s) and discussion of plans, anticipated problems, and areas of special concern.

3. Based on discussions at this meeting, Contractor may be asked to provide additional submittals or documentation to SBBC before commencement of work.

4. SBBC retains the right to waive the requirement of a pre-construction meeting for any specific asbestos abatement project.

D. If SBBC permits Contractor to use any of its equipment, tools, utilities, or facilities, such use shall be gratuitous and Contractor shall release them from any responsibility arising from claims or personal injuries, including death, arising out of the use of such equipment, tools, or facilities

irrespective of the condition thereof or any negligence on the part of SBBC in permitting their use.

E. Should Contractor fail or be unable to execute the contract and complete the work for any reason, then Contractor shall be penalized in accordance with agreements stated in contract documents.

F. Consultant or SBBC retain the right to stop work by and/or dismiss Contractor for any breach of specified procedures, including but not limited to airborne fiber levels above 0.01 f/cc measured outside containment. Dismissal of Contractor may result in claims against Contractor in accordance with agreements stated in contract documents.

G. Inspections: Inspections of work area will be made by Consultant at scheduled intervals during the course of the project. It is Contractor's responsibility to ensure that:

1. Work area is initially cleaned and properly prepared for removal of ACM.
2. Asbestos-containing materials are being properly removed.
3. Employees of Contractor are properly protected.
4. All asbestos-containing materials have been removed in accordance with the procedures contained in these specifications, in additional documents provided by Consultant, or referenced in the RFP.

H. The inspections will merely confirm that these conditions have been met. It is the sole responsibility of Contractor to correct any subsequent discoveries of inadequate initial cleaning, preparation, work procedures, or remaining ACM encountered after an inspection, regardless of the outcome of such an inspection.

I. Supervisory Personnel: Contractor must have an accredited Supervisor on the job site at all times, from mobilization to tear-down. Failure to have a Supervisor present shall result in termination of all asbestos abatement activities for the remainder of the day, or until an accredited Supervisor is again present. Contractor shall not begin work until an accredited Supervisor is present, and shall cease all work when Supervisor leaves the work site.

J. Security of Containments: Contractor must secure all entrances to containments with a lockable plywood door. The door will be locked with a combination lock. The combination will be given to Consultant, and SBBC Police and Special Services Department. When decontamination units are located on the exterior of buildings, Contractor must cover the exterior portion of decontamination unit with 1/2" plywood, or suitable optional material to be approved by SBBC.

SECTION 1.00 GENERAL REQUIREMENTS

PART 2.0 SUBMITTALS, NOTICES, RECORDKEEPING, AND REFERENCES

1.2.1 Submittals

A. Upon notification of award of contract, Contractor must submit to Consultant the following documents:

1. A copy of Contractor's licenses.

2. A certificate of insurance issued by Contractor's insurance carrier which indicates that Contractor holds an asbestos risk insurance policy on an occurrence basis for an amount not less than $2,000,000 U.S. dollars. The insurance carrier must be state-admitted, and rated at least B+ by a nationally recognized insurance rating agency. The certificate of insurance shall name SBBC and Consultant as additionally insured.

3. A notarized statement signed by an officer of the company, containing the following information:

   a. A complete record of citations issued by Federal, State, or Local regulatory agencies in the United States and its recognized territories relating to asbestos abatement activities. Include projects, dates and resolutions.

   b. A list of penalties incurred through non-compliance with asbestos abatement project specifications including liquidated damages, overruns in scheduled time limitations, and resolutions.

   c. Situations in which an asbestos abatement-related contract has been terminated including projects, dates and reasons for termination.

   d. Copies of any notices of intent to initiate enforcement or settlement agreements such as: Notice of Violation, Notice of Intent to Enforce Violation, or Consent Agreements issued to Contractor in the past five years.

   e. A list of any asbestos-related legal proceedings/claims in which Contractor, or employees scheduled to participate in this project, have participated in for the past five years, or are currently involved in.

4. A copy of Contractor's drug and alcohol abuse policy.

5. The resumes of the person(s) who are employed by Contractor and are licensed as asbestos abatement contractors in the State of Florida, and all accredited Supervisors that will be used in the asbestos abatement projects for SBBC.

6. A copy of the training certificates and current medical records for all personnel to be employed on asbestos abatement projects for SBBC.

7. A copy of Contractor's Respiratory Protection Program that includes:
   a. A statement of Respiratory Protection Training

b. Current copies of qualitative or quantitative respirator fit test results for all employees to be used on asbestos abatement projects for SBBC. Respirator fit tests must be performed using respirator brands worn by Contractor's employees.

c. A copy of the current medical certificates for all employees to be used on asbestos abatement projects for SBBC. The certificates must have the name of the medical center, name of attending physician, and signature of attending physician, and some indication that the individual is physically capable of performing asbestos abatement work.

8. A copy of each type of form used by Contractor in the course of asbestos abatement work, including forms used for daily logs and containment entry logs.

9. A copy of a certificate of Worker Acknowledgment and Statement of Worker's Release for each employee to be used on asbestos abatement projects for SBBC.

10. A copy of Contractor's Worker Protection Procedures.

11. A copy of the emergency procedures and evidence employee training in these procedures.

12. A copy of the manufacturer's certification that vacuums, ventilation equipment, and other equipment required to contain airborne fibers conform to American National Standards Institute (ANSI) "Fundamentals Governing the Design and Operation of Local Exhaust Systems", Publication Z9.2-79, and certification that all respirators to be used are NIOSH and MSHA approved.

13. A copy of the product specifications for all other asbestos abatement supplies and equipment to be used on asbestos abatement projects for SBBC. These product specifications include, but are not limited to: protective clothing, head gear, footwear, safety belts, goggles, fire-retardant polyethylene sheeting, pressurized washers, shredders, and all other equipment or supplies that shall require decontamination on the asbestos abatement projects.

14. Documentation and test results for encapsulating materials proposed for use as "lock-down" encapsulant. Documents must indicate the compatibility of encapsulant with the material to be used for replacement of ACM.

15. A written description of the proposed landfill(s) to be used by Contractor with a statement that proposed landfill(s) meet all applicable Federal, State, and Local regulations for the disposal of ACM removed in SBBC buildings for this contract.

16. A copy of the product specifications and material safety data sheets for all encapsulants to be used on asbestos abatement projects for SBBC for this contract.

17. A sample of warning signs and barrier tape to be used on the asbestos abatement projects.

18. A statement that reserve or auxiliary power for HEPA-filtered exhaust units has been obtained in case of power failure.

19. A statement that initial cleaning before the initiation of any response action in work areas shall be performed in accordance with 40 CFR Part 763.91(c).

20. A statement that all Contractor employees to be used on the job site have seen (viewed videotape), read, and understood SBBC safety rules, if any, for outside contractors. A complete list of employees with signatures stating the above must be received by SBBC.

21. A statement that all royalties and patents have been honored by Contractor or that Contractor holds Owner harmless from any situation arising from negligence of Contractor to honor such fees.

B. Five working days prior to proceeding with a specific asbestos abatement project, Contractor must submit to SBBC the following documents:

1. A copy of the notice of intent to demolish or renovate to the Florida Department of Environmental Protection, or U.S. Environmental Protection Agency, depending on the location of the work.

2. A proposed Schedule of Progress for the specific asbestos abatement project.

3. A copy of Contractor's assessment of existing building and fixture damage present in the building or work area(s) prior to release of the building to Contractor. This document may be submitted to SBBC either before or after the pre-construction meeting for any specific project.

C. Upon completion of a specific asbestos abatement project, Contractor must submit the following to SBBC:

1. All disposal receipts for asbestos-containing materials acquired during the asbestos abatement project.

2. A copy of all daily logs, sign-in sheets, and daily reports.

3. The original daily chart recordings from manometers for the specific asbestos abatement project, or documentation that negative pressure was continually maintained throughout the course of the specific project.

4. A certification of compliance statement that all asbestos-containing materials related to the RFP have been removed and disposed of in accordance with all applicable federal, regional, state, and local regulations for asbestos abatement.

D. All submittals to SBBC are expected to be neat, complete, and accurate.

1.2.2 Notices to Contractor

The following section contains general notices applicable to Contractor for all asbestos abatement work for SBBC:

A. Employee Behavior

1. Contractor must provide its employees with a written policy of drug and alcohol abuse. No employee of Contractor shall be allowed to remain on SBBC property who is intoxicated by drugs and/or alcohol, or who is observed using drugs or alcohol on SBBC property.

2. Contractor is expected to enforce its drug and alcohol abuse policy at all times while conducting business.

3. Weapons, and other hazardous, dangerous or otherwise disruptive items in the possession of Contractor, or its employees are not allowed on SBBC property.

4. Contractor and its employees are required to display good manners to building staff and occupants at all times while on SBBC property. Complaints to Consultant or SBBC regarding harassment, threatening behavior, poor personal hygiene, or use of profanity or offensive language by any employee of Contractor may result in the suspension of abatement activities until the behavior problem is corrected, or employee is removed from SBBC property.

B. Performance Standards: Contractor shall perform all asbestos removal using techniques and procedures recognized by the asbestos removal industry as being safe and effective in the control of fiber release during removal of ACM. Contractor is expected to perform all removal, cleaning, and disposal operations in a manner that would meet final air clearance standards for analysis by Transmission Electron Microscope (TEM) or Phase Contrast Microscope (PCM) depending on the size of the project and the material removed.

C. Pay Requests: Requests for payment by Contractor must be submitted to SBBC for approval.

D. Analytical and Test Results

1. Results of bulk sample analyses of ACM pertaining to the scope of the asbestos abatement projects are available from SBBC or Consultant at Contractor's request.

2. Results of background and previous air monitoring tests made by Consultant prior to commencement of work will be available from Consultant upon request prior to the beginning of asbestos removal project.

3. Results of final air tests analyzed by PCM will be made available to Contractor within, at least, 12 hours of collection of the sample. Results of final air tests analyzed by TEM will be made available within, at least, 24 hours of completion of collection of the sample. Consultant will make every reasonable effort to obtain these test results in a time and manner suitable to Contractor's work schedule.

E. Condition of Building and Fixtures: Contractor and Consultant shall agree in writing on the condition of the building and fixtures, prior to commencement of work. Damages incurred by Contractor must be either repaired or damaged materials replaced at Contractor's expense.

F. Royalties and Patents: All fees, royalties, and claims for any invention, or pretended invention, or patent on any article, material, arrangement, appliance or method that may be used upon or in any manner be connected with the construction of this work or appurtenances are hereby included in the prices stipulated in this contract for said work; Contractor hereby expressly binds himself or itself to indemnify and save harmless SBBC from all such claims, fees, and from any and all suits and actions of every name and description that may be brought against SBBC on account of any such claims, fees, royalties, or costs for any such invention or patent, and from any and all suits or actions that may be brought against SBBC for the infringement of any and all patents or patent rights claimed by any person, firm or corporation.

F. Indemnification: Contractor agrees to indemnify, defend, save and hold harmless SBBC from all claims, demands, liabilities, and suits of any nature whatsoever to the extent they arise out of, or are due to the negligent or wrongful act or omission by Contractor or its employees.

1.2.3 Recordkeeping

A. For each building where ACM has been removed, all records concerning removal of asbestos-containing materials shall be kept and a copy of these records given to Consultant at the completion of the asbestos removal project. The Consultant shall submit all documentation to SBBC.

B. Furnish to Consultant a copy of training records for each person used by Contractor.

C. For each asbestos abatement project performed for SBBC, Contractor shall certify that all asbestos-containing materials related to the RFP have been removed and disposed of in accordance with all applicable federal, regional, state, and local regulations for asbestos abatement.

1.2.4 Applicable Reference Documents

The most recent issue of each document is applicable. In case of overlapping jurisdiction of documents or regulations, the most stringent requirements are applicable.

A. Applicable Regulations

Compliance with all applicable regulations is required. These regulations include, but are not limited to:

EPA 40 CFR part 61, subpart A: Regulation for Asbestos

EPA 40 CFR part 61, subpart M: National Emission Standard for Asbestos

EPA 40 CFR 763 subpart E: Asbestos-Containing Materials in Schools; Final Rule and Notice

EPA 40 CFR 763 subpart G: Asbestos Abatement Projects; Worker Protection

OSHA 29 CFR part 1910.157: Portable Fire Suppression Equipment; Portable Fire Extinguishers

OSHA 29 CFR part 1910, subpart Z: Occupational Exposure to Asbestos, Tremolite, Anthophyllite, and Actinolite; Final Rule

OSHA 29 CFR 1926 subpart D: Asbestos Standard for Construction Industry

OSHA 20 CFR part 1910 subpart I: Personal Protective Equipment

OSHA 29 CFR part 1910.134: Respiratory Protection

OSHA 29 CFR part 1910.1200: Hazard Communication

DOT 49 CFR parts 171 and 172: Hazardous Substances Transportation

OSHA 20 CFR part 1910.1020: Access to Employee Exposure and Medical Records

OSHA 29 CFR part 1910.146: Permit Required for Confined Spaces

OSHA 29 CFR part 1910.147 The Control of Hazardous Energy (Lockout/Tagout) Asbestos: Final Rule

Florida Statutes F.S. 455.301 - 455.308: Licensure of Asbestos Consultants and Contractors

Procedures described in the following guidance documents are also applicable to this contract unless specifically stated by Consultant or his agent:

EPA 600/4-85-049: Measuring Airborne Asbestos Following an Abatement Action (November)

EPA 560/5-85-005: Evaluation of the EPA Asbestos-in Schools Identification and Notification Rule

EPA 560/5-85-006: Asbestos in Buildings: National Survey of Asbestos-Containing Friable Materials

EPA 560/5-85-024 Guidance for Controlling Asbestos-Containing Materials in Buildings

EPA 530 SW-85-007 Asbestos Waste Management Guidance (May)

NIOSH 7400 Method: NIOSH Manual of Analytical Methods, NIOSH Publication 84-100.

NIOSH 7402 Method: Asbestos Fibers, NIOSH Manual of Analytical Methods, NIOSH Publication 84-100

1.2.5 Warning Signs and Labels

A. Each disposal container shall be marked with labels that read as follows:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER & LUNG DISEASE HAZARD
AVOID BREATHING AIRBORNE ASBESTOS TREMOLITE, ANTHOPHYLLITE,
ACTINOLITE, CROCIDOLITE, AMOSITE, OR CHRYSOTILE FIBERS
RQ Hazardous Substance
Solid, N.O.S. (ASBESTOS)
ORM-E, NA9188

B. Warning signs shall be posted at all entrances to the work area and shall be labeled as follows:

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

C. Barrier tape shall be placed at all hallways and corridors that lead to the work area and will display the following:

DANGER DO NOT ENTER

OR

RESTRICTED AREA - AUTHORIZED PERSONNEL ONLY

SECTION 1.00 GENERAL REQUIREMENTS

PART 3.0 EQUIPMENT REMOVAL, SITE SECURITY, AND SITE CONDITIONS

1.3.1 Equipment Removal Procedures

Clean external surfaces of contaminated containers and equipment thoroughly by wet-cleaning with sponges, or use HEPA-filtered vacuum before moving such items into equipment decontamination unit washroom for final cleaning and removal to uncontaminated areas. Ensure that personnel do not leave work areas through equipment decontamination unit.

1.3.2 Site Conditions

A. Facilities: Domestic power and access to water will be made available for Contractor's use for the duration of each specific abatement project. When these utilities are inadequate, Contractor must supply additional utilities.

B. Extent of initial cleaning: All exposed surfaces in work areas having damaged or significantly damaged friable ACM, and will be protected by fire-retardant polyethylene sheeting shall be thoroughly cleaned with HEPA-filtered vacuums and wet-cleaned prior to installation of fire-retardant polyethylene sheeting over these surfaces.

C. Equipment storage: Arrangement for equipment storage will be made during pre-construction meeting.

D. Dumpster location: Arrangements for location of dumpsters to be made at pre-construction meeting. All dumpsters used on asbestos abatement projects for SBBC must be secured with locks. Dumpsters must remain locked at all times while present on SBBC property, except when opened to receive waste.

E. Contractor parking: Arrangements for Contractor employee parking to be made at the pre-construction meeting.

F. Use of building facilities: Contractor and SBBC shall agree on arrangements for use of building facilities, such as restrooms and eating facilities, prior to commencement of work.

SECTION 1.00 GENERAL REQUIREMENTS

PART 4.0 PERSONAL PROTECTION

1.4.1 Personal Protection

A. Prior to commencement of work, the workers must be instructed and knowledgeable on the hazards of asbestos exposure, on the use and fitting of respirators, on protective clothing, and on all aspects of work practices and protective measures. This training must comply with all regulations applicable to worker training in the State of Florida. All workers must have evidence of current accreditation in their possession, or I.D. cards issued by the training provider. Workers having expired accreditation certificates will not be allowed in the work area.

B. In accordance with 29 CFR 1910.157, Contractor shall supply fire extinguishers for use inside and outside the work area. Contractor shall ensure that all employees have been instructed in the general principles of fire extinguisher use and the hazards involved with incipient stage fire fighting.

C. Respiratory Protection

1. Provide workers with personally issued and marked respiratory equipment approved by NIOSH and suitable for asbestos exposure level in work area.

2. Half-mask, dual cartridge, air purifying respirators must be worn by all personnel during the preparation of work areas having friable ACM. Respiratory protection will not be required for preparation of work areas having only nonfriable ACM. Workers may use respiratory protection when not required, if they so desire.

3. If Contractor personnel intend to use a respirator less efficient than a Powered Air Purifying Respirator (PAPR) for removal of friable ACM, Contractor must make available air testing results that show that fiber levels for similar work performed in the past were less than 0.1 f/cc. When fiber counts in excess of 0.1 f/cc are anticipated, PAPR or Type C pressure demand respiratory equipment will be the minimum required respiratory equipment.

4. When respirators with disposable filters are employed, Contractor must provide sufficient replacement filters as required by the worker or applicable regulations.

D. Respirator Selection and Protection Factors: The following table shall be used as guideline for respirator selection criteria for asbestos removal projects:

Table 1. Respirator Selection Criteria

Respirator Type	OSHA Protection Factor	Maximum Protection f/cc
Air Purifying:		
Half-mask	10x	0.1
Full-mask	50x	0.5
PAPR	1000x	10.0
Air Supplied:		
Continuous	1000x	10.0
Pressure Demand	1000x	10.0
Self-Contained*	10.000x	100.0

*Pressure demand mode

E. Protective Clothing

1. All employees of Contractor, and authorized visitors are required to wear protective clothing while inside work areas. The protective clothing must be worn properly. No modifications to the clothing may be made that exposes the wearer's skin, other than the hands and face.

2. Contractor must provide workers and authorized visitors with sufficient sets of protective full body clothing. Such clothing will consist of protective full body coveralls and headgear. Contractor must provide eye protection and hard hats to all employees and authorized visitors, as required by applicable safety regulations.

3. Non-disposable protective clothing and footwear must be left in equipment room until the completion of the asbestos abatement work. At this time, such items must be disposed of as ACM, or must be thoroughly cleaned of all ACM. Disposable protective clothing, headgear, and footwear may be provided.

4. The use of canvas or leather footwear is strictly prohibited in contaminated areas or work areas. All authorized personnel must wear rubber boots, or other approved footwear that is easily decontaminated. Footwear must be approved by Consultant.

F. Provide and post, in equipment room and clean room, the decontamination procedures, work procedures, and personal protection procedures to be followed by workers, as described in PARAGRAPH I of this part of these specifications.

G. Provide and post, in clean room, the location of the nearest hospital, telephone, applicable emergency phone numbers, and any other emergency information and procedures for this work.

H. Provide and post by the entrance, the name of the contractor, supervisor’s name and phone number, and the 24-hour phone number for SBBC site security (407) 317-3333.

I. Worker Protection Procedures

1. Each worker and authorized visitor must, upon entering the job site: remove street clothing in clean room and put on a respirator with new filters and clean protective clothing before entering equipment room or work area.

2. All workers and authorized visitors must, each time they leave work area:

   a. Remove gross contamination from clothing before leaving work area

   b. Proceed to equipment room, remove all clothing except respirators and optional swimsuit, and proceed directly to shower room.

   c. Clean the outside of the respirator with soap and water while showering

   d. Remove the respirator and thoroughly shampoo and wash themselves

   e. Remove filters if warranted, wet them, and dispose of filters in the container provided for this purpose

   f. Wash and rinse the inside of the respirator

3. After showering and drying off, each worker and authorized visitor must:

   a. Proceed directly to clean room and dress in uncontaminated street clothes at the end of each day's work, or before eating, smoking, or drinking.

   b. Before re-entering work area from clean room, each worker and authorized visitor must put on clean respirator and must dress in clean protective clothing.

4. Workers intending to re-wear contaminated protective clothing stored in equipment room must enter equipment room wearing only respirators (workers will be permitted to wear tight-fitting, nylon swimsuits beneath their protective clothing).

5. Workers removing waste containers from equipment decontamination unit must enter holding area from outside wearing a respirator and dressed in clean protective clothing. No worker shall use this unit as a means to leave or enter washroom or work area.

6. Workers must not eat, drink, smoke, or chew gum or tobacco at the worksite except outside the controlled area. Smoking will not be permitted in the building at any time.

J. Type C Air Supplied System

When a Type C Supplied Air System is to be used, the following specifications apply:

1. Grade D Air: Compressed air must be at least Grade D quality. Certification of Grade D air quality must be supplied by an independent testing lab after the system has been installed on site.

2. Compression: When supplied air is required, compressors shall be used throughout removal project to generate the air supply. The following specifications apply to compressor

procedures:

a. Compressor Shut Down: Interconnect monitors, alarms and compressor so that compressor is automatically shut down and the alarms sounded if any of the following occur:

   1) Carbon monoxide (CO) concentrations exceed 5 ppm/v in the air line between the filter bank and backup air supply,

   2) Compressor temperature exceeds normal operating range.

b. Compressor Location: Locate compressor in a location that will not impede access to the building and that will not cause a nuisance by virtue of noise or fumes to occupied portions of the building.

c. Air Intake: Locate air intake remotely from any source of automobile exhaust or any exhaust from motors or buildings.

3. Purification: Supplied air must be purified using the following system of equipment:

   a. After cooler
   b. A coalescing filter
   c. Two adsorption filters consisting of:
      1) A molecular sieve to remove water vapor
      2) An activated charcoal filter
   d. A carbon monoxide catalytic converter
   e. A mechanical filter capable of removing particles greater than 10 microns in diameter.
   f. A carbon monoxide monitor equipped with a visual and audible alarm.

4. Storage: Provisions must be made to store a volume of air sufficient for safe exit from work area in the event of compressor failure. Stored air may not be necessary when respirators are equipped with a HEPA egress filter. HEPA egress filters may be used for emergency egress only.

5. Delivery: The air supply system must deliver air at a pressure sufficient to meet the respirator manufacturer's flow requirements. Any air-line respirators chosen must be of the Positive Pressure, Pressure Demand type, and approved by NIOSH. No unapproved respirators may be used at any time. The maximum air-line length must not exceed 300 feet, and maximum inlet pressure at the mask must not exceed 125 psi.

K. Protection from Heat Stress: In work areas where heat stress to workers is inevitable, such as roofs and hot mechanical rooms Contractor must provide the following:

1. Adequate work breaks in cool areas outside work area, and/or body vests with ice pack inserts, depending on the site conditions.

2. For exterior work areas, a respirator decontamination facility may be used in a remote section of work area (as described in SECTION 4.00, PART 1.0) so workers may maintain body fluids with a replenishing drink.

SECTION 2.00 MATERIALS AND EQUIPMENT

PART 1.0 MATERIALS

2.1.1 Materials

A. Contractor must furnish all materials and equipment necessary for removal and disposal of ACM in a manner consistent with these specifications. These materials include but are not limited to:

1. Fire-retardant polyethylene sheeting (6 mil minimum thickness).
2. Staples, nails, and tape capable of sealing joints and securing polyethylene to all necessary surfaces.
3. Surfactant mixed in recommended proportions.
4. Containers to receive and retain ACM with appropriate labels.
5. Warning signs and labels (OSHA 29 CFR 1910.1001).
6. Glove bags.
7. Encapsulant.
8. Other Materials: All necessary materials for removal and disposal of asbestos in compliance with all applicable codes and regulations, and these specifications.

B. Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name.

C. Store all materials subject to damage off the ground, away from wet or damp surfaces, and under cover sufficient to prevent damage or contamination.

D. Damaged or deteriorated materials shall not be used and must be removed from the premises. Material that becomes contaminated with asbestos must be disposed of in accordance with the applicable regulations.

SECTION 2.00 MATERIALS AND EQUIPMENT

PART 2.0 TOOLS AND EQUIPMENT

2.2.1 Tools and Equipment

A. Provide suitable tools for asbestos removal, including but not limited to scrapers, brushes, razor knives, wrenches, tools for constructing containment and decontamination units, brooms, carts, and safety equipment.

B. Provide suitable air moving and exhaust equipment, including but not limited to:

1. A method for maintaining pressure differential of 0.02 inches of water column inside containment than outside.
2. HEPA-filtered vacuums.
3. Recording manometers for monitoring the pressure inside containment relative to outside.
4. Portable lighting and power supplies as necessary.

C. No equipment shall cause suspension of ACM within work area or discharge of asbestos fibers outside of work area.

SECTION 3.00 EXECUTION

This section applies to the preparation, removal, cleanup, and disposal of asbestos-containing materials that are friable, nonfriable, and mastic material. Refer to SECTION 4.00 for SPECIAL PROCEDURES to be used for removal of exterior roofing materials, exterior asbestos cement panels, glove bag removal, mini-containment, and decontamination of contaminated areas.

PART 1.0 PREPARATION

This part is intended to be used as a general specification for preparation of work area for any particular asbestos abatement project for SBBC.

3.1.1 General

Proper preparation of the work area prior to asbestos abatement is crucial to the success of asbestos abatement projects. The general aspects of preparation of the work area, as required by SBBC are discussed below:

A. Critical Barriers: All asbestos abatement work shall require the installation of critical barriers at all penetrations to the work area.

B. HVAC and Electrical Shut Down: HVAC systems serving the work area must be either shut down or temporarily capped on all asbestos abatement projects. Electrical systems serving the work area shall be shut down and secured, or special provisions with SBBC must be made to ensure the safety of abatement workers while asbestos abatement is performed. All electrical equipment used by Contractor in the work area must have GFI circuits. The electrical supply to the work area must be located outside the containment.

C. Pre-cleaning: When Consultant has determined that friable or damaged asbestos-containing materials have contaminated or potentially contaminated equipment and surfaces in the work area, Contractor must HEPA vacuum and wet-wipe these items before application of protective covering.

D. Polyethylene Sheeting: In general, all fixed objects and architectural surfaces in the work area must be protected from contamination during asbestos removal or from damage from application of encapsulant after asbestos removal. In certain instances, a wall, floor, or ceiling covering may not be required if the material is smooth, non-porous, easily cleaned, and will not be aesthetically affected or damaged by application of encapsulants.

E. Pressure Differential: All work areas must be placed under a pressure differential of at least minus 0.02 inches of water column, with respect to outside areas, prior to disturbance of asbestos-containing materials. If an adequate pressure differential can not be established on small-scale, short-duration work, or in confined spaces then the intake of HEPA-filtered exhaust units must be placed within three feet of the area where asbestos is being disturbed.

3.1.2 Preparation for Friable Materials

Friable ACM include, but are not limited to: spray-applied fireproofing; spray-applied ceilings or walls; plaster walls (during demolition); all thermal system insulation classified as corrugated asbestos paper, asbestos block, plaster mud insulation, or mudded fitting insulation; ceiling tiles; or any other materials identified by SBBC or Consultant as being friable ACM.

A. Preparation for Full Containment for Friable Materials

1. Post warning signs and barrier tape in and around work area as required by all applicable regulatory agencies, and restrict access to work area to approved and authorized personnel.

2. Shut down electric power when necessary. Proper Lockout/Tagout procedures shall be used to ensure that the power source will not be reenergized during the removal activities. Provide temporary power and lighting and ensure safe installation of temporary power sources and equipment per applicable electric code requirements and provide low-voltage safety lighting. Use ground-fault interrupter circuits (GFIC) at all power receptacles in work area. Locate power source for electrical equipment outside work area. All electrical work must be carried out by a licensed electrician.

3. Clean supply and return air grilles, remove filters and dispose of filters as ACM.

4. Shut down and isolate heating, cooling and ventilating air systems to prevent contamination and fiber dispersal to other areas of the structure. During the work, vents within work area must be sealed with, at least, tape and fire-retardant polyethylene sheeting, unless otherwise directed by Consultant.

5. Clean moveable objects and carpeting within the proposed work areas using HEPA-filtered vacuums and/or wet-cleaning methods as appropriate, and remove such objects from work area to a suitable temporary location.

6. Clean fixed objects within the proposed work area using HEPA-filtered vacuums and/or wet-cleaning methods as appropriate, and enclose objects with 6 mil fire-retardant polyethylene sheeting sealed with tape.

7. Clean proposed work areas using HEPA-filtered vacuums or wet-cleaning methods as appropriate. Methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters must not be used.

8. Seal off all openings, including but not limited to: corridors, doorways, elevators, skylights, ducts, grills, diffusers, and any other penetrations of work areas. Doorways and corridors that will not be used for passage during work must be sealed with barriers. These seals are barriers critical to the integrity of containment and must be left in place until final air testing is complete and the results received and approved. Allowances must be made for emergency exits.

9. Cover surfaces with fire-retardant polyethylene sheeting in the following manner:

    a. Cover walls or erect temporary walls with 2 layers of (6 mil minimum thickness) fire-retardant polyethylene sheeting sealed with tape. This sheeting must be secured by staples and tension nails as necessary to maintain the integrity of containment throughout removal and testing process. The two layers of fire-retardant polyethylene sheeting must be placed so the upper layer can be removed without damaging the integrity of the lower layer.
    b. Cover floors with 2 layers of (6 mil minimum thickness) fire-retardant polyethylene sheeting sealed with tape, when appropriate. The floor covering must extend at least 12" up the wall to contain leakage. The wall covering must overlap the floor covering.

    c. Cover ceilings with 2 layers of (6 mil minimum thickness) fire-retardant polyethylene

sheeting, sealed with tape, when appropriate. This sheeting must be secured in a manner that shall maintain the integrity of containment throughout removal and testing.

d. For work areas that do not have an adequately flat surface, or have extensive mechanical and/or electrical fixtures attached to the ceiling, Contractor shall perform initial cleaning of the exposed surfaces at the ceiling prior to removal, and perform wet-cleaning and HEPA-vacuuming during final cleanup. The ceiling area shall be encapsulated prior to final air testing.

10. Construct airlocks between contaminated area and uncontaminated area, consisting of two curtained doorways at least 6 feet apart, at entrances to and exits from work area.

11. Cover, isolate, or remove and clean ceiling-mounted objects, such as lights and other items not previously sealed off, or covered, that interfere with asbestos abatement. Use localized water spraying or HEPA-filtered vacuums during fixture removal to reduce fiber dispersal.

12. Maintain emergency and fire exits from work areas, or establish alternative exits satisfactory to the fire code.

13. Seal all unused elevator doors on floors where work is in progress with fire-retardant polyethylene sheeting and plywood.

B. Decontamination Units

1. Build suitable framing and line with double layer of fire-retardant polyethylene sheeting sealed with tape at all lap joints in the fire-retardant polyethylene sheeting for all containments and decontamination unit rooms.

2. Access between contaminated and uncontaminated rooms or areas must be through an airlock consisting of two curtained doorways at least 6 feet apart, at entrances to and exits from work area. Access between any two rooms within decontamination unit must be through a curtained doorway.

3. Construct a worker decontamination unit contiguous to work area consisting of three totally enclosed rooms as follows:

a. An equipment room with two curtained doorways, one to work area and one to shower room.

b. A shower room with two curtained doorways, one to equipment room and one to clean room. Shower room must contain at least one shower with hot and cold water.

1) Careful attention must be paid to shower room to insure against leaking of any kind and to insure proper drainage of shower water. There must be no standing water in the shower stall or shower room. Insure a supply of soap at all times in shower room.
2) Waste water must be filtered through a medium that is capable of removing suspended particles of a diameter greater than or equal to 5 microns. Filtered waste water must be discharged into public sanitary sewer systems. Discharge of filtered water onto surface soil, asphalt, concrete, or any other porous surface shall not be permitted.

c. A clean room with one curtained doorway into shower room and one entrance or exit to

non-contaminated areas of the building. Clean room must have sufficient space for storage of the workers street clothes, towels, and other non-contaminated items.

4. (Optional, unless indicated by SBBC or Consultant) Provide or construct an equipment decontamination unit consisting of two totally enclosed rooms as follows:

   a. A washroom, consisting of an airlock, with a curtained doorway to a designated area of work area and a curtained doorway to holding area.

   b. A holding area, consisting of an airlock, with a curtained doorway to an uncontaminated area.

   c. When the uncontaminated area is an elevator, a lockable plywood door must also be constructed and placed over the elevator door.

   d. Worker decontamination unit may be used as an equipment decontamination unit when deemed appropriate by Consultant.

5. All decontamination units must have a Plexiglas window installed to provide a reasonable view of work area. If a reasonable view can not be obtained from decontamination unit, Contractor may install two or more Plexiglas windows in uncontaminated areas that provide a reasonable view of work area.

C. Establish Pressure Differential and Ventilation

1. Install HEPA-filtered exhaust units in work area to lower concentration of airborne fibers in work area and contain airborne fibers.

2. Install a sufficient amount of HEPA-filtered exhaust units to maintain a complete volume change in work area 4 times per hour, or more, when required by Consultant, and to maintain a pressure differential between the uncontaminated and contaminated areas of at least 0.02 inches of water column.

3. Locate HEPA-filtered exhaust units so that make-up air enters work area through decontamination unit, or other suitable source of make-up air. Place HEPA-filtered exhaust units as far as possible from the entrance/exit or other make-up air sources.

4. Exhaust ducts shall be placed through opening in fire-retardant polyethylene sheeting barrier, window, or wall covering, sealed with tape, and vented to outside of building.

5. Start HEPA-filtered exhaust units prior to removal and continue operating until final air clearance of work area has been successfully obtained. If an electric power failure occurs, stop removal immediately. Contractor must arrange for back-up power source for HEPA-filtered exhaust units on all abatement projects. Spare units and back-up power must be available to guarantee continuous operation.

6. Replace the air filters in HEPA-filtered exhaust unit under the following circumstances:

   a. When the unit's manometer indicates that a pressure drop across the filters exceeds 1.0 inch of water, replace pre-filter first.

   b. Replace intermediate filter if manometer still exceeds 1.0 inch

c. Replace HEPA filter if replacement of pre- and intermediate filters does not reduce manometer reading.

7. HEPA-filtered exhaust units will be inspected at regular intervals by Consultant to ensure proper maintenance, and correct placement of filters.

8. When pressure differential system is shut down at the end of the project, the filters must be left in HEPA-filtered exhaust unit and HEPA-filtered vacuums, and openings on these items must be sealed with polyethylene sheeting and duct tape. Exhaust tubes and vacuum tubes for the HEPA-filtered must be sealed with duct tape in double bags or 2 layers of fire-retardant polyethylene sheeting. Filters on these pieces of equipment must not be replaced after final cleanup is complete to avoid any risk of re-contaminating the area.

C. Separation of Work Areas from Occupied Areas

1. Maintenance of Containment:

a. Ensure that barriers and fire-retardant polyethylene sheeting are effectively sealed and taped. Repair damaged barriers and sheeting, and remedy defects immediately upon discovery. Maintenance is to continue until clearance to remove containment is given by Consultant.

b. Supervisor shall visually inspect containment continually for the duration of each work shift.

c. Monitor effectiveness of barriers with recording manometer. A pressure differential must be maintained at all times, beginning at the first disturbance of ACM and ending only when final air testing results show that fiber concentrations are acceptable by whichever method has been specified in the SCOPE OF WORK for final air clearance.

d. The strip chart from the recording manometer must be marked with the date and time and submitted to Consultant daily.

3. Asbestos abatement work shall not be permitted until:

a. Arrangements have been made for disposal of waste at the selected and approved landfill, as identified in Contractor submittals.

b. Arrangements have been made to contain, filter or properly dispose of contaminated wastewater. No asbestos-contaminated waste water is to be discharged unfiltered into public sanitary sewer systems.

1) Waste water must be filtered through a medium that is capable of removing suspended particles of a diameter of greater than or equal to 5 microns.

2) Discharge of filtered water onto surface soil, asphalt, concrete, or any other porous surface shall not be permitted.

c. Decontamination units are in place and work area is effectively isolated from the remainder of the building

d. All other preparatory steps have been taken and applicable notices posted and permits obtained.

e. An inspection of each containment by Consultant will be performed prior to the start of removal. Removal shall not be performed until the condition of each containment is approved by Consultant.

3.1.3 Preparation for Nonfriable Materials

Nonfriable ACM include, but are not limited to: non-ACM thermal system insulation coated with asbestos-containing mastic; asbestos cement board, panel, or pipe; vinyl floor tiles, and mastic; or any other materials identified by SBBC or Consultant as being nonfriable ACM.

A. Prepare Work Areas Having Nonfriable Materials in the Following Manner:

1. Post warning signs and barrier tape in and around work area as required by all applicable regulatory agencies, and restrict access to work area to personnel approved by Consultant.

2. Shut down electric power when necessary. Proper Lockout/Tagout procedures shall be used to ensure that the power source will not be reenergized during the removal activities. Provide temporary power and lighting and ensure safe installation of temporary power sources and equipment per applicable electric code requirements and provide low-voltage safety lighting. Use ground-fault interrupter circuits (GFIC) at all power receptacles in work area. Locate power source for electrical equipment outside work area. All electrical work must be carried out by a licensed electrician.

3. Shut down and isolate heating, cooling and ventilating air systems to prevent contamination and fiber dispersal to other areas of the structure. During the work, vents within work area must be sealed with, at least, tape and fire-retardant polyethylene sheeting.

4. Clean moveable objects and carpeting within the proposed work areas using HEPA-filtered vacuums and/or wet-cleaning methods as appropriate, and remove such objects from work area to a suitable temporary location.

5. Clean fixed objects within the proposed work area using HEPA-filtered vacuums and/or wet-cleaning methods as appropriate, and enclose objects with 6 mil (minimum thickness) fire-retardant polyethylene sheeting sealed with tape.

6. Clean proposed work areas using HEPA-filtered vacuums or wet-cleaning methods as appropriate. Methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters shall not be used.

7. Seal off all openings with critical barriers. Critical barriers must be placed on penetrations that include but are not limited to: corridors, doorways, elevators, skylights, ducts, grills, diffusers, and any other penetrations of work areas. Doorways and corridors that will not be used for passage during work must be sealed with barriers. These seals are critical to the integrity of containment and must be left in place until final air testing is complete and the results received and approved. Allowances must be made for emergency exits.

8. Cover surfaces with fire-retardant polyethylene sheeting in the following manner:

   a. Cover walls from the floor to the ceiling with 2 layers of (6 mil minimum thickness) fire-

retardant polyethylene sheeting sealed with tape when directed by Consultant. This sheeting must be secured as necessary to maintain the integrity of the covering throughout removal and testing process.

b. Cover floors with 2 layers of (6 mil minimum thickness) fire-retardant polyethylene sheeting sealed with tape, when directed by Consultant. The floor covering must extend at least 12" up the wall to contain leakage. The wall covering must overlap the floor covering.

c. Cover ceilings with 2 layers of (6 mil minimum thickness) fire-retardant polyethylene sheeting, sealed with tape, when directed by Consultant. This sheeting must be secured in a manner that shall maintain the integrity of the covering throughout removal and testing process.

d. For work areas that do not have an adequately flat surface, or have extensive mechanical and/or electrical fixtures attached to the ceiling, Consultant shall determine if these areas require initial cleaning prior to removal.

9. Construct airlocks consisting of two curtained doorways at least 6 feet apart, at entrances to and exits from work area.

10. Cover ceiling-mounted objects, such as lights and other items not previously sealed off, or covered, that interfere with asbestos abatement.

11. Maintain emergency and fire exits from work areas, or establish alternative exits satisfactory to the fire code.

B. Decontamination Units - General

1. For nonfriable asbestos removal a remote or contiguous decontamination unit may be used. The type of facility will be determined by Consultant prior to commencement of work...

2. Build suitable framing and line with double layer of fire-retardant polyethylene sheeting sealed with tape at all lap joints in the fire-retardant polyethylene sheeting for all containments and decontamination unit rooms.

3. Access between contaminated and uncontaminated rooms or areas must be through an airlock consisting of two curtained doorways at least 6 feet apart, at entrances to and exits from work area. Access between any two rooms within decontamination unit must be through a curtained doorway.

C. Decontamination Units - Remote

1. Construct worker entry containment contiguous to work area consisting of two totally enclosed rooms as follows:

a. An equipment room with two curtained doorways, one to work area and one to shower room.

b. A clean room with one curtained doorway into equipment room and one entrance or exit to non-contaminated areas of the building. Clean room must have sufficient space for storage of the workers street clothes and other non-contaminated items.

2. Provide or construct a remote decontamination unit consisting of three totally enclosed rooms as follows:

    a. An equipment room with two curtained doorways, one to work area and one to shower room. Equipment room must have a HEPA-filtered exhaust unit located near the entrance to provide airflow through the remote decontamination unit.

    b. A shower room with two curtained doorways, one to equipment room and one to clean room. Shower room must contain at least one shower with hot and cold water.

        1) Careful attention must be paid to shower room to insure against leaking of any kind and to insure proper drainage of shower water. There must be no standing water in the shower stall or shower room. Ensure a supply of soap at all times in shower room.

        2) Waste water must be filtered through a medium that is capable of removing suspended particles of a diameter greater than or equal to 5 microns. Filtered waste water must be discharged into public sanitary sewer systems. Discharge of filtered water onto surface soil, asphalt, concrete, or any other porous surface shall not be permitted.

    c. A clean room with one curtained doorway into the shower and one entrance or exit to non-contaminated areas of the building. Clean room must have sufficient space for storage of the worker's street clothes, towels, and other non-contaminated items.

D. Decontamination Units - Contiguous

1. Construct a worker decontamination unit contiguous to work area consisting of three totally enclosed rooms as follows:

    a. An equipment room with two curtained doorways, one to work area and one to shower room.

    b. A shower room with two curtained doorways, one to equipment room and one to clean room. Shower room must contain at least one shower with hot and cold water.

        1) Careful attention must be paid to shower room to insure against leaking of any kind and to insure proper drainage of shower water. There must be no standing water in the shower stall or shower room. Ensure a supply of soap at all times in shower room.

        2) Waste water must be filtered through a medium that is capable of removing suspended particles of a diameter greater than or equal to 5 microns. Filtered waste water must be discharged into public sanitary sewer systems. Discharge of filtered water onto surface soil, asphalt, concrete, or any other porous surface shall not be permitted.

    c. A clean room with one curtained doorway into shower room and one entrance or exit to non-contaminated areas of the building. Clean room must have sufficient space for storage of the workers street clothes, towels, and other noncontaminated items.

2. (Optional, unless otherwise indicated by SBBC or Consultant) Provide or construct an equipment decontamination unit consisting of two totally enclosed rooms as follows:

    a. A washroom, consisting of an airlock, with a curtained doorway to a designated area of work area and a curtained doorway to holding area.

    b. A holding area, consisting of an airlock, with a curtained doorway to an uncontaminated area.

    c. Worker decontamination unit may be used as an equipment decontamination unit when deemed appropriate by Consultant.

E. Establish Pressure Differential and Ventilation

1. Install HEPA-filtered exhaust units in work area to lower concentration of airborne fibers in the contaminated area, and contain airborne fibers.

2. Install a sufficient amount of HEPA-filtered exhaust units to maintain a complete volume change in work area 4 times per hour, or more, when required by Consultant, and to maintain a pressure differential between the uncontaminated and contaminated areas of at least 0.02 inches of water column.

3. Locate HEPA-filtered exhaust units so that make-up air enters work area through decontamination unit, or other suitable source of make-up air. Place HEPA-filtered exhaust units as far as possible from the entrance/exit or other make-up air sources.

4. Exhaust ducts must be placed through opening in fire-retardant polyethylene sheeting barrier, window, or wall covering, sealed with tape, and vented to outside of building.

5. Start HEPA-filtered exhaust units prior to removal and continue operating until decontamination of work area is complete. If an electric power failure occurs, stop removal immediately. Contractor must arrange for back-up power source for HEPA-filtered exhaust units on all abatement projects. Spare units and back-up power must be available to guarantee continuous operation.

6. Replace the air filters in HEPA-filtered exhaust unit under the following circumstances:
    a. When the unit's manometer indicates that a pressure drop across the filters exceeds 1.0 inch of water column, replace pre-filter first.

    b. Replace intermediate filter if manometer still exceeds 1.0 inch of water column.

    c. Replace HEPA filter if replacement of pre- and intermediate filters does not reduce manometer reading.

7. HEPA-filtered exhaust units will be inspected at regular intervals by Consultant to ensure proper maintenance and seating of filters.

8. When pressure differential system is shut down at the end of the project, the filters must be left in HEPA-filtered exhaust unit and HEPA-filtered vacuums, and openings on these items must be sealed with polyethylene sheeting and duct tape. Exhaust tubes and vacuum tubes for the HEPA-filtered must be sealed with duct tape in double bags or 2 layers of fire-retardant polyethylene sheeting. Filters on these pieces of equipment must not be replaced

after final cleanup is complete to avoid any risk of re-contaminating the area.

F. Separation of Work Areas from Occupied Areas

1. Maintenance of Containment:

a. Ensure that barriers and fire-retardant polyethylene sheeting are effectively sealed and taped. Repair damaged barriers and sheeting, and remedy defects immediately upon discovery. Maintenance is to continue until clearance to remove containment is given by Consultant.

b. Supervisor shall visually inspect containment continually for the duration of each work shift.

c. Monitor effectiveness of barriers with recording manometer. A pressure differential must be maintained at all times, beginning at the first disturbance of ACM and ending only when final air testing results show that fiber concentrations are acceptable for final air clearance.

2. Asbestos abatement work shall not begin until:

a. Arrangements have been made for disposal of waste at the selected and approved landfill, as identified in Contractor submittals.

b. Arrangements have been made to contain, filter or properly dispose of contaminated wastewater. No asbestos-contaminated waste water is to be discharged unfiltered into public sanitary sewer systems.

1) Waste water must be filtered through a medium that is capable of removing suspended particles of a diameter greater than or equal to 5 microns.

2) Discharge of filtered water onto surface soil, asphalt, concrete, or any other porous surface shall not be permitted.

c. Decontamination units are in place and work area is effectively isolated from the remainder of the building.

d. All other preparatory steps have been taken and applicable notices posted and permits obtained.

e. An inspection of containments by Consultant will be performed prior to the start of removal. No removal shall be performed until the condition of each containment is approved by Consultant.

SECTION 3.00 EXECUTION

PART 2.0 ASBESTOS REMOVAL

This section is intended to be used as a general specification for asbestos removal in work area for any particular asbestos abatement project for SBBC.

3.2.1 Asbestos Removal, Friable Materials

A. Prepare site as per 3.1.1. and 3.1.2. In areas where ACM is greater than 2" thick, wetting would begin the day before removal is to take place.

B. Spray asbestos material with amended water using spray equipment capable of providing a mist application to reduce the release of fibers. Saturate friable material sufficiently to wet the substrate without causing excessive wetting, dripping, or delamination of the material.

C. Spray the asbestos material repeatedly during removal process to maintain wet condition and minimize asbestos fiber dispersion. The spraying must not be used as a technique to remove or dislodge ACM.

D. Remove saturated asbestos material in small sections. As it is removed, pack the material in sealable 6 mil polyethylene bags and place in appropriately labeled (OSHA CFR 1910.1001 (g)(2)) container for transport. Material must not be allowed to dry out or be tracked around or re-suspended in work area prior to placement in containers.

E. Waste Load-out Procedure

1. Seal bags or containers. Clean external surfaces of containers thoroughly by wet-cleaning in the designated area of work area that is part of equipment decontamination unit.

2. Move containers to washroom, wet-clean each container thoroughly, and move to holding area pending removal to uncontaminated areas. The material must be placed in a clean bag or container as it exits the equipment washroom and enters holding area.

3. Ensure that containers are removed from holding areas by workers who have entered from uncontaminated areas dressed in clean coveralls. Ensure that workers do not enter from uncontaminated areas into washroom or work area. Ensure that contaminated workers do not exit work area through equipment decontamination unit.

4. When disposal bags are used, the bagged material must be placed within a second bag in equipment decontamination unit. The second, outer bag must be labeled with all applicable warnings, including D.O.T. labeling.

    a. Double bagged material shall then be passed through clean room to a covered cart for removal from the building.

    b. When larger pieces of material are to be disposed of, the material must be wrapped in 2 layers of fire-retardant polyethylene sheeting and properly labeled in equipment decontamination unit.

5. All bags, containers, and drums that are to be buried at the disposal site must be tagged with the numbering system approved by SBBC.

F. Secondary Removal

1. After completion of gross removal work, all surfaces from which asbestos has been removed must be brushed and/or wet-cleaned by an equivalent method to remove all visible material, including the mastic. During this work the surfaces being cleaned must be kept wet.

2. Consultant will individually approve each area of encapsulation in writing prior to commencement of encapsulation.

3. Encapsulant is to be applied only to surfaces from which ACM has been removed and must not be used as a method for sealing dust on surfaces.

3.2.2 Asbestos Removal, Nonfriable Materials

A. Prepare site as per 3.1.1 and 3.1.3.

B. Wet nonfriable material with amended water and remove with appropriate equipment. Dispose of material according to waste load-out procedure.

OR

C. Spray asbestos material with amended water using spray equipment capable of providing a mist application to reduce the release of fibers. Saturate friable material sufficiently to wet the substrate without causing excessive wetting, dripping, or delamination of the material.

D. Spray the asbestos material repeatedly during removal process to maintain wet condition and minimize asbestos fiber dispersion. The spraying must not be used as a technique to remove or dislodge ACM.

E. Remove material in small sections. As it is removed place the material in sealable 6 mil polyethylene bags and place in appropriately labeled (OSHA CFR 1910.1001 (g)(2)) container for transport. Material must not be allowed to dry out in work area prior to placement in containers.

F. Waste Load-out Procedure

1. Seal bags or containers. Clean external surfaces of containers thoroughly by wet-cleaning in the designated area of work area that is part of equipment decontamination unit.

2. Move containers to decontamination unit or washroom, wet-clean each container thoroughly, and move to storage area located outside building, or holding area pending removal to uncontaminated areas. The material must be placed in a clean bag or container as it exits decontamination unit or equipment washroom and enters holding area.

3. Ensure that containers are removed from decontamination unit, or holding areas by workers who have entered from uncontaminated areas dressed in clean coveralls. Ensure that workers do not enter from uncontaminated areas into equipment room, or washroom, or work area. Ensure that contaminated workers do not exit work area through equipment decontamination unit.

4. When disposal bags are used, the bagged material must be placed within a second bag in

equipment decontamination unit. The second, outer bag must be labeled with all applicable warnings, including D.O.T. labeling.

a. Double bagged material shall then be passed through clean room to a covered cart for removal from the building.

b. When larger pieces of material are to be disposed of, the material must be wrapped in 2 layers of fire-retardant polyethylene sheeting and properly labeled in equipment decontamination unit.

5. All bags, containers, and drums that are to be buried at the disposal site must be tagged with the numbering system approved by SBBC.

G. Secondary Removal

1. After completion of gross removal work, all surfaces from which asbestos has been removed must be brushed and/or wet-cleaned by an equivalent method to remove all visible material. During this work the surfaces being cleaned must be kept wet with solvent.

2. Consultant will individually approve each area for encapsulation in writing prior to commencement for encapsulation.

3. Encapsulant is to be applied only to surfaces from which ACM has been removed and must not be used as a method for sealing dust on surfaces.

3.2.3 Asbestos Removal, Mastic Materials

A. Procedure for Removal of Mastic-coated Insulation

1. Place warning signs at entrances to work areas, and use barrier tape to restrict access.

2. Install airlock or curtained doorway at entrance to work area. Install critical barriers on all floor, wall and ceiling penetrations. Place one layer of 6 mil fire-retardant polyethylene sheeting on floor below insulation to be removed.

3. Use HEPA-filtered exhaust units to provide ventilation to work area.

4. Mist insulation with amended water and remove insulation in small sections. Place in bag immediately.

5. Wipe down duct or pipe surfaces with amended water and rags. Apply encapsulant to any remaining mastic on sheet metal surfaces or metal pipes.

6. Dispose of bagged material as per SECTION 3.5.1 DISPOSAL.

B. Procedure for Removal of Floor Tile Mastic

1. Apply solvent to remaining mastic and allow an appropriate period of time for the solvent to dissolve the mastic.

2. Remove mastic material in small sections. As it is removed place the dissolved mastic

material in sealable 6 mil polyethylene bags and place in appropriately labeled (OSHA CFR 1910.1001 (g)(2)) container for transport. Material must not be allowed to dry out or be tracked around in work area prior to placement in containers.

3. Seal bags or containers. Clean external surfaces of containers thoroughly by wet-cleaning in the designated area of work area that is part of equipment decontamination unit.

4. Move containers to decontamination unit, wet-clean each container thoroughly, and move to storage area located outside building, or holding area pending removal to uncontaminated areas. The material must be placed in a clean bag or container as it exits decontamination unit and enters holding area.

5. Ensure that containers are removed from decontamination unit by workers who have entered from uncontaminated areas dressed in clean coveralls. Ensure that workers do not enter from uncontaminated areas into equipment room or work area.

6. When disposal bags are used, the bagged material must be placed within a second bag in equipment decontamination unit. The second, outer bag must be labeled with all applicable warnings, including D.O.T. labeling.

    a. Double bagged material must then be passed through clean room to a covered cart for removal from the building.

    b. When larger pieces of material are to be disposed of, the material must be wrapped in 2 layers of fire-retardant polyethylene sheeting and properly labeled in equipment decontamination unit.

7. All bags, containers, and drums that are to be buried at the disposal site must be tagged with the numbering system approved by SBBC.

C. Secondary Removal

1. After completion of gross removal work, all surfaces from which asbestos has been removed must be brushed and/or wet-cleaned by an equivalent method to remove all visible material. During this work the surfaces being cleaned must be kept wet with solvent, unless otherwise directed by Consultant.

2. Consultant will individually approve each area for encapsulation in writing prior to commencement of encapsulation.

3. Encapsulant is to be applied only to surfaces from which ACM has been removed and shall not be used as a method for sealing dust on surfaces.

SECTION 3.00 EXECUTION

PART 3.0 CLEANUP

This part is intended to be used as a general specification for cleanup of work area for any particular asbestos abatement project for SBBC.

3.3.1 Cleanup

A. Remove visible accumulations of asbestos material and debris. Wet-clean all surfaces within work area.

B. Remove the upper layer of fire-retardant polyethylene sheeting from walls and floors only. The windows, doors, and HVAC vents must remain sealed and any HEPA-filtered exhaust units, air filtration and decontamination unit must remain in place and in service.

C. Clean all surfaces in work area and any other contaminated areas with wet-cleaning methods using amended water, and/or using HEPA-filtered vacuums. After cleaning work area, allow for settlement of dust, and again wet-clean or clean with HEPA-filtered vacuums, all surfaces in work area. After completion of the second cleaning operation, perform a complete visual inspection of work area to ensure that work area is free of dust and/or visible asbestos debris.

D. Time for settlement of dust between initial cleaning and final cleaning will be determined by Consultant. Typical settling times for various types of ACM are: 12-16 hours for friable materials, and 3-4 hours for nonfriable materials.

E. Sealed containers and all equipment in use in work area must be included in the cleanup and must be removed from work area via equipment decontamination unit, at an appropriate time in the cleaning sequence.

SECTION 3.00 EXECUTION

PART 4.0 INSPECTIONS AFTER REMOVAL

This part is intended to be used as a general specification for inspections of work area for any particular asbestos abatement project for SBBC.

3.4.1 Inspections After Removal (see also 5.1)

A. If Consultant finds visible accumulations of asbestos debris in work area after the completion of step 3.3.1 (C), Contractor shall repeat wet-cleaning until work area is in compliance, at Contractor's expense.

B. When an inspection by Consultant in the presence of Contractor determines that the area is free of accumulations of dust and visible asbestos debris and the final air clearance has been met, decontamination unit shall be removed, the area thoroughly wet-cleaned, and materials from equipment room and shower room disposed of as contaminated waste.

C. A final inspection will be carried out by Consultant in the presence of Contractor to ensure that no dust or debris remains on surfaces as a result of dismantling operations.

SECTION 3.00 EXECUTION

PART 5.0 DISPOSAL

This part is intended to be used as a general specification for disposal of asbestos-containing materials for any particular asbestos abatement project for SBBC.

3.5.1 Disposal

A. Preparation and Security of Waste Holding Areas

1. Prepare enclosed transport vehicles and/or enclosed dumpsters with at least 2 layers of 6 mil fire-retardant polyethylene sheeting.

2. Secure transport vehicles and dumpsters with padlocks. Dumpsters and waste transport vehicles must be locked at all times while engaged in asbestos disposal on SBBC property, except when waste materials are being loaded into these items.

B. Storage and Disposal of Containers

1. Containers of ACM shall not be stored in uncontaminated areas, but must be moved directly from work area to an enclosed dumpster in enclosed carts.

2. ACM must be disposed of at the selected and approved disposal site in accordance with requirements of all applicable disposal authorities.

3. Disposal documents and receipts must be submitted to Consultant prior to final clearance of Contractor.

C. Contractor must tag each container to be buried at the disposal site with a label that displays the numbering system approved by SBBC.

D. Discharge of Waste Water

1. All waste water must be filtered through a medium that is capable of removing all suspended particles of a diameter greater than or equal to 5 microns.

2. All filtered waste water must be discharged into public sanitary sewer systems. Discharge of filtered water onto surface soil, asphalt, concrete, or any other porous surface shall not be permitted.

SECTION 4.00 SPECIAL PROCEDURES

This section is intended to be used as a general specification for special procedures for any particular asbestos abatement project for SBBC.

PART 1.0 EXTERIOR ASBESTOS REMOVAL

This part applies only to removal of nonfriable exterior roofing materials, nonfriable asphalt-based exterior mastic materials, or nonfriable exterior asbestos cement panels.

4.1.1 Personal Protection

A. Exterior work may be performed using half-mask, dual cartridge, air purifying respirators. Organic vapor cartridges placed in tandem with HEPA filters shall be required when solvents are used to remove mastic materials.

B. All workers engaged in exterior removal must wear protective clothing over disposable underwear, or a tight-fitting, nylon swimsuit. Shoes may be worn for exterior work, provided the shoes are stored in sealed bags in equipment room of the remote decontamination unit at the end of the day, and properly decontaminated after completion of the work.

4.1.2 Protection from Heat Stress

In exterior areas where heat stress to workers is inevitable, the Contractor must provide the following:

A. Frequent work breaks in cool areas outside work area, and/or body vests with ice pack inserts, depending on the site conditions.

B. A respirator decontamination facility (see 4.1.4) may be located in a remote section of work area so workers may maintain body fluids with a replenishing drink.

4.1.3 Remote Decontamination Units

Locate decontamination units in an exterior or interior area when access from the contaminated work area can be accomplished through a tunnel constructed with fire-retardant polyethylene sheeting (for interior decontamination units) or at ground level with exterior access. See SECTION 3.00, PART 1.0, PARAGRAPH C, REMOTE DECONTAMINATION UNITS, for specifications for remote decontamination unit construction.

4.1.4 Respirator Decontamination Facilities (Optional)

A respirator decontamination facility consisting of a water hose equipped with a spray nozzle, an adequate supply of 6 mil bags, and an adequate supply of disposable towels may be used in a remote section of work area so workers may maintain body fluids with a replenishing drink.

1. Each person who uses the respirator decontamination facility shall rinse the exterior of the respirator while holding head over an open 6 mil bag.

2. After thoroughly rinsing the respirator each person shall wipe the excess water off the exterior of the respirator with a disposable towel, and dispose of the towel in the bag.

3. After removing excess water from the exterior of the respirator, the respirator may be removed.

4. Waste water that has accumulated in the rinse bag shall be disposed of as ACM or properly filtered in the decontamination unit.

4.1.5 Exterior Asbestos Removal

A. Provide suitable tools for removal of asbestos cement panels, roof felts, tar, and mastics. Roof cutters are permissible only when proper steps are taken to ensure dust-free removal conditions, and local regulatory agencies permit the use of such equipment.

B. Spray asbestos material with amended water using spray equipment capable of providing a mist application to reduce the release of fibers. Saturate the material sufficiently to wet the substrate without causing excess dripping.

C. Remove wet asbestos material in small sections. As it is removed wrap the material in 6 mil fire-retardant polyethylene sheeting and place in appropriately labeled (OSHA CFR 1910.1001 (g)(2)) lined with 6 mil fire-retardant polyethylene sheeting and enclosed truck or closed dumpster for transport.

D. Asbestos cement panels must be removed carefully and in complete sections. Breakage of the panels must be minimized, and must not be used as a method of removal without written approval of Consultant.

E. Roofing material may be cut with a roof cutter provided that steps are taken to eliminate the generation of dust and the local governing regulations permit such use. This may be accomplished by wetting with amended water and placing a HEPA-filtered exhaust unit or HEPA-filtered vacuum sufficiently close to the cutter to ensure a dust-free removal.

F. After completion of removal work, all surfaces from which asbestos has been removed must be wet-cleaned, and the entire surface must be vacuumed with a HEPA-filtered vacuum.

G. Any adhesive materials such as mastic, asphalt, or tar must be removed using a suitable (non-toxic) solvent. The residue must be bagged and properly disposed of as ACM. On porous or irregular surfaces where all traces of ACM cannot be removed, encapsulant may be applied. Prior to encapsulation, however, these areas must be inspected and approved by Consultant.

H. Encapsulant is to be applied only to surfaces from which ACM has been removed and must not be used as a method for sealing ACM on surfaces. Consultant will individually approve each area of encapsulation in writing prior to commencement of encapsulation.

SECTION 4.00 SPECIAL PROCEDURES

PART 2.0 GLOVE BAG PROCEDURE

Glove bag procedures may only performed when access and preparation limit possibilities for removal. The procedure shall only be utilized when work of small-scale, short-duration is planned, or when the circumstances dictate this type of removal, as determined by Consultant.

4.2.1 Personal Protection

A. The glove bag procedure may be performed using half-mask, dual cartridge, air purifying respirators, provided Contractor shows previous, similar work has not produced airborne fiber levels in excess of 0.01 fibers/cc during the glove bag removal procedure.

B. All workers engaged in glove bag removal work must wear protective clothing over disposable underwear, or a tight-fitting, nylon swimsuit. Shoes may be worn for the glove bag procedure, provided the shoes are stored in sealed bags in equipment room of the remote decontamination unit at the end of the day, and properly decontaminated after completion of the work.

4.2.2 Preparation for Glove Bag Procedure

A. Post warning signs and barrier tape in and around work area as required by all applicable regulatory agencies, and restrict access to work area to personnel approved by Consultant.

B. Shut down electric power when necessary. Proper Lockout/Tagout procedures shall be used to ensure that the power source will not be reenergized during the removal activities. Provide temporary power and lighting and ensure safe installation of temporary power sources and equipment per applicable electric code requirements and provide low-voltage safety lighting. Use ground-fault interrupter circuits (GFIC) at all power receptacles in work area. Locate power source for electrical equipment outside work area. All electrical work must be carried out by a licensed electrician.

C. Shut down and isolate heating, cooling and ventilating air systems to prevent contamination and fiber dispersal to other areas of the structure. During the work, vents within work area must be sealed with, at least, tape and fire-retardant polyethylene sheeting.

D. Clean moveable objects and carpeting within the proposed work areas using HEPA-filtered vacuums and/or wet-cleaning methods as appropriate, and remove such objects from work area to a suitable temporary location.

E. Clean fixed objects within the proposed work area using HEPA-filtered vacuums and/or wet-cleaning methods as appropriate, and enclose objects with 6 mil fire-retardant polyethylene sheeting sealed with tape.

F. Cover floors, walls, and ceilings, in the proposed work areas using 6 mil fire-retardant polyethylene sheeting, as appropriate. Cover scaffolding with at least one layer of 6 mil fire-retardant polyethylene sheeting, when appropriate.

G. Seal off all openings, including but not limited to: corridors, doorways, elevators, skylights, ducts, grills, diffusers, and any other penetrations of work areas. Doorways and corridors that will not be used for passage during work must be sealed with barriers.

H. Prepare curtained doorways at entrances to and exits from work area.

4.2.3 Remote Decontamination Unit

A. Build suitable framing and line with double layer of fire-retardant polyethylene sheeting sealed with tape at all lap joints in the fire-retardant polyethylene sheeting for all decontamination units.

B. Access between contaminated and uncontaminated rooms or areas must be through an airlock consisting of two curtained doorways at least 6 feet apart, at entrances to and exits from work area. Access between any two rooms within decontamination unit must be through curtained doorway.

C. Construct a worker decontamination unit near work area consisting of three totally enclosed rooms as follows:

1. An equipment room with two curtained doorways, one to work area and one to shower room. Equipment room must have a HEPA-filtered exhaust unit located near the entrance to provide airflow through the remote decontamination unit.

2. A shower room with two curtained doorways, one to equipment room and one to clean room. Shower room must contain at least one shower with hot and cold water.

    a. Careful attention must be paid to shower room to insure against leaking of any kind and to insure proper drainage of shower water. There must be no standing water in the shower stall and shower room. Insure a supply of soap at all times in shower room.

    b. Waste water must be filtered through a medium that is capable of removing suspended particles of a diameter greater than or equal to 5 microns. Filtered waste water must be discharged into public sanitary sewer systems. Discharge of filtered water onto surface soil, asphalt, concrete, or any other porous surface shall not be permitted.

3. A clean room with one curtained doorway into shower room and one entrance or exit to noncontaminated areas of the building. Clean room must have sufficient space for storage of the workers street clothes, towels, and other noncontaminated items.

D. Workers may use double suits, or decontaminate a single suit with a HEPA-filtered vacuum. Before leaving work areas each worker must remove and dispose of the outer suit (if double suits are used) and dispose of this suit in a suitable container (see 3.5.1 DISPOSAL), or thoroughly vacuum the suit using a HEPA-filtered vacuum (if single suits are used) before leaving the glove bag work area to enter decontamination unit.

4.2.4 Separation of Work Areas from Occupied Areas

A. Maintenance of Critical Barriers

1. Ensure that barriers and fire-retardant polyethylene linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately upon discovery. Maintenance is to continue until clearance to remove critical barriers is given by Consultant.

2. Supervisor shall visually inspect critical barriers continually for the duration of each work shift.

B. Asbestos abatement work shall not begin until:

1. Arrangements have been made for disposal of waste at the selected and approved landfill, as identified in Contractor submittals.

2. Arrangements have been made to contain, filter or properly dispose of contaminated wastewater. No asbestos-contaminated waste water is to be discharged unfiltered into public sanitary sewer systems.

   a. Waste water must be filtered through a medium that is capable of removing suspended particles of a diameter greater than or equal to 5 microns.

   b. Discharge of filtered water onto surface soil, asphalt, concrete, or any other porous surface shall not be permitted.

3. Glove bag and decontamination unit are in place and work area is effectively isolated from the remainder of the building.

4. All other preparatory steps have been taken and applicable notices posted and permits obtained.

5. An inspection of the glove bag containments by Consultant will be performed prior to the start of removal. No removal shall be performed until the condition of the glove bag containments are approved by Consultant.

4.2.5 Asbestos Removal

A. Install critical barriers and place work area under negative pressure.

B. Install glove bag according to manufacturer's recommendations, and in accordance with 29 CFR 1926.58, Appendix G.

C. Cut covering on insulation along the top seam to allow wetting of the insulation, and cut cover all around section to be removed.

D. Remove ACM in small sections. Lower the insulation carefully in the bottom of the glove bag. Do not drop material. One glove bag must be used for each section of ACM to be removed. Sliding or re-use of a single glove bag is strictly prohibited. Use appropriate size bag for the dimensions of the material to be removed to ensure economy of materials.

E. Prior to removal of the glove bag, ensure that all surfaces from which asbestos has been removed are clean of all visible material, and that the upper portion of the bag is clean of all visible waste. Spray all surfaces and tools in the glove bag with amended water. Wipe all sections of pipe with rag or appropriate material. Wipe upper section of bag as well.

F. Use appropriate encapsulant on all surfaces inside the bag. Cover exposed insulation remaining on pipe with wettable fiberglass, duct tape, or other suitable material.

G. Place tools inside sleeves of glove bag and isolate from interior of glove bag. Collapse bag using HEPA-filtered vacuum. Squeeze and twist bag at mid-level to isolate waste from upper portion of

bag. Seal bag with duct tape or locking ties. Vacuum the unsealed upper portion. Keep HEPA-filtered vacuum connected until the glove bag is removed. Cut the glove bag along the top and sides, and then remove from pipe. Cut off isolated sleeves containing any tools or supplies from bag and place in bucket of water. Clean tools in equipment room of decontamination unit.

H. Disposal of glove bag, material, and waste water (see SECTION 3.5.1 DISPOSAL).

I. HEPA vacuum bags and HEPA filters must be removed to a location and in a manner that will prevent any asbestos fiber release.

SECTION 4.00 SPECIAL PROCEDURES

PART 3.0 MINI-CONTAINMENT PROCEDURE

The mini-containment may be specified in certain instances, such as removal of ACM from a small ventilation system or from a short length of duct where a glove bag may be appropriate to adequately contain the asbestos fibers during removal. The procedure shall only be utilized when work of small-scale, short-duration is planned, or when the circumstances dictate this type of removal, as determined by Consultant.

4.3.1 Personal Protection

A. The mini-containment procedure may be performed using half-mask, dual cartridge, air purifying respirators, provided Contractor shows previous, similar work has not produced airborne fiber levels in excess of 0.01 fibers/cc during mini-containment removal procedures in the past.

B. All workers engaged in mini-containment removal work must wear protective clothing over disposable underwear, or a tight-fitting, nylon swimsuit. Shoes may be worn for the mini-containment procedure, provided the shoes are stored in sealed bags in equipment room of the remote decontamination unit at the end of the day, and properly decontaminated after completion of the work.

4.3.2 Preparation for Mini-Containment Procedure

A. Post warning signs and barrier tape in and around work area as required by all applicable regulatory agencies, and restrict access to work area to personnel approved by Consultant.

B. Shut down electric power when necessary. Proper Lockout/Tagout procedures shall be used to ensure that the power source will not be reenergized during the removal activities. Provide temporary power and lighting and ensure safe installation of temporary power sources and equipment per applicable electric code requirements and provide low-voltage safety lighting. Use ground-fault interrupter circuits (GFIC) at all power receptacles in work area. Locate power source for electrical equipment outside work area. All electrical work must be carried out by a licensed electrician.

C. Shut down and isolate heating, cooling and ventilating air systems to prevent contamination and fiber dispersal to other areas of the structure. During the work, vents within work area must be sealed with, at least, tape and fire-retardant polyethylene sheeting.

D. When appropriate, clean moveable objects and carpeting within the proposed work areas using HEPA-filtered vacuums and/or wet-cleaning methods as appropriate, and remove such objects from work area to a suitable temporary location.

E. When appropriate, clean fixed objects within the proposed work area using HEPA-filtered vacuums and/or wet-cleaning methods as appropriate, and enclose objects with 6 mil fire-retardant polyethylene sheeting sealed with tape.

F. Construct mini-containment using a double layer of fire-retardant polyethylene sheeting placed over a temporary frame constructed with 2x4" lumber or other suitable material, as determined by Consultant. When permanent walls are present, and will suffice for containment barriers, cover walls and ceilings with a double layer of fire-retardant polyethylene sheeting.

G. Construct a change room contiguous to the mini-containment consisting of a double layer of fire-retardant polyethylene sheeting attached to 2x4" lumber or other suitable material, as determined by Consultant. The change room shall be at least 3 square feet in area, and shall have curtained doorways at the entrance to work area and exit to uncontaminated areas.

H. Place HEPA-filtered vacuum or low-volume HEPA-filtered exhaust unit in such a manner that a pressure differential can be established in the change room.

I. Seal off all openings, including but not limited to: ducts, grills, diffusers, and any other penetrations of work area within mini-containment. Doorways and corridors outside the mini-containment that will not be used for passage during work must be barricaded with barrier tape.

4.3.3 Remote Decontamination Unit

A. Build suitable framing and line with double layer of fire-retardant polyethylene sheeting sealed with tape at all lap joints in the fire-retardant polyethylene sheeting for all decontamination units.

B. Access between contaminated and uncontaminated rooms or areas must be through an airlock consisting of two curtained doorways at least 6 feet apart, at entrances to and exits from work area. Access between any two rooms within decon unit must be through curtained doorway.

C. Construct a worker decontamination unit near work area consisting of three totally enclosed rooms as follows:

1. An equipment room with two curtained doorways, one to work area and one to shower room. Equipment room must have a HEPA-filtered exhaust unit located near the entrance to provide airflow through the remote decontamination unit.

2. A shower room with two curtained doorways, one to equipment room and one to clean room. Shower room must contain at least one shower with hot and cold water.

    a. Careful attention must be paid to shower room to insure against leaking of any kind and to insure proper drainage of shower water. There must be no standing water in the shower stall and shower room. Insure a supply of soap at all times in shower room.

    b. Waste water must be filtered through a medium that is capable of removing suspended particles of a diameter greater than or equal to 5 microns. Filtered waste water must be discharged into public sanitary sewer systems. Discharge of filtered water onto surface soil, asphalt, concrete, or any other porous surface shall not be permitted.

3. A clean room with one curtained doorway into shower room and one entrance or exit to noncontaminated areas of the building. Clean room must have sufficient space for storage of the workers street clothes, towels, and other noncontaminated items.

D. Workers may use double suits, or decontaminate a single suit with a HEPA-filtered vacuum. Before leaving work areas each worker must remove and dispose of the outer suit (if double suits are used) and dispose of this suit in a suitable container (see 3.5.1 DISPOSAL), or thoroughly vacuum the suit using a HEPA-filtered vacuum (if single suits are used) before leaving the mini-containment to enter decontamination unit.

4.3.4 Separation of Work Areas from Occupied Areas

A. Maintenance of Mini-Containment

1. Ensure that barriers and fire-retardant polyethylene linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately upon discovery. Maintenance is to continue until clearance to remove mini-containment is given by Consultant.

2. Supervisor shall visually inspect mini-containment continually for the duration of each work shift.

B. Asbestos abatement work shall not begin until:

1. Arrangements have been made for disposal of waste at the selected and approved landfill, as identified in Contractor submittals.

2. Arrangements have been made to contain, filter or properly dispose of contaminated wastewater. No asbestos-contaminated waste water is to be discharged unfiltered into public sanitary sewer systems.

   a. Waste water must be filtered through a medium that is capable of removing suspended particles of a diameter greater than or equal to 5 microns.

   b. Discharge of filtered water onto surface soil, asphalt, concrete, or any other porous surface shall not be permitted.

3. Mini-containment and decontamination unit are in place and work area is effectively isolated from the remainder of the building.

4. All other preparatory steps have been taken and applicable notices posted and permits obtained.

5. An inspection of the mini-containment by Consultant will be performed prior to the start of removal. No removal shall be performed until the condition of the mini-containment is approved by Consultant.

4.3.5 Asbestos Removal

A. Mist materials with amended water and remove materials in small sections. Place in bag immediately.

B. Wipe down exposed surfaces with amended water and rags.

C. Seal bags or containers. Clean external surfaces of containers thoroughly by wet-cleaning in the mini-containment.

4.3.6 Waste Load-out Procedure

A. Move containers to change room, wet-clean each container thoroughly, and move to storage area located outside building, or holding area pending removal to uncontaminated areas. The material must be placed in a clean bag or container as it exits mini-containment and enters change room.

B. Ensure that containers are removed from change room by workers who have entered from uncontaminated areas dressed in clean coveralls. Ensure that workers do not enter from uncontaminated areas into mini-containment.

C. When disposal bags are used, the bagged material must be placed within a second bag in change room. The second, outer bag must be labelled with all applicable warnings, including D.O.T. labeling.

    1. Double-bagged material must then be passed through change room to a covered cart for removal from the building.

    2. When larger pieces of material are to be disposed of, the material must be wrapped in 2 layers of fire-retardant polyethylene sheeting and properly labelled in change room.

D. All bags, containers, and drums that are to be buried at the disposal site must be tagged with the numbering system approved by SBBC.

4.3.7 Cleanup and Encapsulation

A. After completion of removal work, all surfaces from which asbestos has been removed must be brushed and/or wet-cleaned by an equivalent method to remove all visible material.

B. Consultant will individually approve each area for encapsulation in writing prior to commencement of encapsulation.

C. Encapsulant is to be applied only to surfaces from which ACM has been removed and shall not be used as a method for sealing dust on surfaces.

SECTION 4.00 SPECIAL PROCEDURES

PART 4.0 DECONTAMINATION OF CONTAMINATED AREAS

In the event that an area of a building is determined by Consultant or SBBC as being contaminated with asbestos dust or debris, the area must be decontaminated using the procedures included in this part of the specification.

4.4.1 Personal Protection

A. All personnel entering an area that is visibly contaminated with assumed, suspected, or known ACM must wear half-mask, dual cartridge, air purifying respirators and protective clothing to install temporary barriers and begin preparation of the contaminated area.

B. When area or personal air samples indicate a level of airborne fibers to be in excess of 0.1 fibers/cc, all personnel in the contaminated area must use PAPR until fiber concentrations are consistently measured below 0.1 fibers/cc.

C. When area or personal air samples indicate a level of fiber concentrations to be in excess 1.0 fibers/cc, all personnel in the contaminated area must use a Type C, pressure demand respirator until fiber concentrations are measured below 1.0 fibers/cc.

D. All personnel entering the contaminated area must wear protective clothing and use decontamination units upon leaving the contaminated area.

4.4.2 Preparation

A. Immediately shut down and isolate heating, cooling and ventilating air systems to prevent contamination and fiber dispersal to other areas of the structure. Adequately wet all visible asbestos debris in the contaminated area. Cover vents within the contaminated area with tape and fire-retardant polyethylene sheeting.

B. Seal off contaminated area with temporary barriers constructed with 6 mil fire-retardant polyethylene sheeting. Construct curtained doorway for temporary access to contaminated area.

C. Construct a worker decontamination unit contiguous to the contaminated area consisting of three totally enclosed rooms as follows:

1. An equipment room with two curtained doorways, one to the contaminated area and one to shower room.

2. A shower room with two curtained doorways, one to equipment room and one to clean room. Shower room must contain at least one shower with hot and cold water.

    a. Careful attention must be paid to shower room to insure against leaking of any kind and to insure proper drainage of shower water. There must be no standing water in the shower stall or shower room. Insure a supply of soap at all times in shower room.

    b. Waste water must be filtered through a medium that is capable of removing suspended particles of a diameter greater than or equal to 5 microns. Filtered waste water must be

discharged into public sanitary sewer systems. Discharge of filtered water onto surface soil, asphalt, concrete, or any other porous surface shall not be permitted.

3. A clean room with one curtained doorway into shower room and one entrance or exit to noncontaminated areas of the building. Clean room must have sufficient space for storage of the workers street clothes, towels, and other noncontaminated items.

D. Seal off all openings, including but not limited to: corridors, doorways, elevators, skylights, ducts, grills, diffusers, and any other penetrations to the contaminated areas. Doorways and corridors that will not be used for passage during work must be sealed with barriers. These seals are barriers critical to the integrity of containment and must be left in place until final air testing is complete and the results received and approved.

4.4.3 Establish Pressure Differential

A. Install HEPA-filtered exhaust units in the contaminated area to lower concentration of airborne fibers in the contaminated area, and contain airborne fibers.

B. Install a sufficient amount of HEPA-filtered exhaust units to maintain a complete volume change in work area 4 times per hour, or more, when required by Consultant, and to maintain a pressure differential between the uncontaminated and contaminated areas of at least 0.02 inches of water column.

C. Locate HEPA-filtered exhaust units so that make-up air enters the contaminated area through decontamination unit, or other suitable source of make-up air. Place HEPA-filtered exhaust units as far as possible from the entrance/exit or other make-up air sources.

D. Exhaust ducts shall be placed through opening in fire-retardant polyethylene sheet barrier, window, or wall covering, sealed with tape, and vented to outside of building.

E. Start HEPA-filtered exhaust units before beginning removal. After removal has begun, run units continuously to maintain a constant pressure differential until decontamination of work area is complete. Start removing at a location farthest from the units and work toward them.

F. When pressure differential system is shut down at the end of the project, the filters must be left in HEPA-filtered exhaust unit and HEPA-filtered vacuums, and openings on these items must be sealed with polyethylene sheeting and duct tape. Exhaust tubes and vacuum tubes for the HEPA-filtered must be sealed with duct tape in double bags or 2 layers of fire-retardant polyethylene sheeting. Filters on these pieces of equipment must not be replaced after final cleanup is complete to avoid any risk of re-contaminating the area.

4.4.4 Decontamination of Contaminated Surfaces

A. Clean moveable objects and carpeting within the contaminated areas using HEPA-filtered vacuums and/or wet-cleaning methods as appropriate, and remove such objects from the contaminated area to a suitable temporary location.

B. Clean fixed objects, including ceiling and wall fixtures, within the contaminated area using HEPA-filtered vacuums and/or wet-cleaning methods as appropriate.

C. Clean all exposed surfaces in the contaminated area using HEPA-filtered vacuums or wet-

cleaning methods as appropriate. Methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters shall not be used.

SECTION 5.00 INSPECTIONS, PROJECT MANAGEMENT, AIR MONITORING, AND COMPLETION

PART 1.0 INSPECTIONS

This section is intended to be used as a general specification for inspections, air monitoring, and completion for any particular asbestos abatement project for SBBC.

5.1.1 Inspections Prior to and During Work

A. Contractor shall make all work areas available to inspection at all times, although Consultant agrees not to cause undue delay in the progress of Contractor's work.

B. Each work area will be inspected by Consultant accompanied by Contractor:

1. Immediately after initial cleaning has been completed and prior to the application of fire-retardant polyethylene sheeting to exposed surfaces.

2. Immediately prior to the commencement of removal of ACM (after preparation of work area is complete).

3. After removal is complete but prior to the application of any encapsulant to the exposed substrates, and pre-encapsulation air testing.

C. Regular inspections of the HEPA-filtered ventilation system will be performed by Consultant to ensure filters are not overloaded, and are properly seated in HEPA-filtered exhaust units.

5.1.2 Inspection of Non Asbestos-Containing Materials

Consultant may inspect all materials from work area that are being disposed of as Non Asbestos-Containing Materials.

5.1.3 Final Visual Inspections

A. A final visual inspection will be made after all Contractor's materials have been removed from work area and all removal, encapsulation, disposal, and related work is completed.

B. Work area must be adequately lighted for inspection by Consultant. Insufficient lighting will result in failure of the final visual inspection.

C. All fire-retardant polyethylene sheeting must be removed from work area, with the exception of critical barriers, and decontamination unit. HEPA-filtered exhaust units must remain operational, and pressure differential maintained until final clearance by TEM or PCM is obtained.

SECTION 5.00 INSPECTIONS, PROJECT MANAGEMENT, AIR MONITORING, AND COMPLETION

PART 2.0 PROJECT MANAGEMENT

5.2.1 Project Management

A. SBBC will employ Consultant to conduct on-site Project Management for all phases of the asbestos abatement work.

B. Consultant will be responsible for:

1. Approval of all submittals by Contractor.

2. Conducting all inspections at the job site, as required.

3. Performing all personal, area, and final air testing throughout the course of each project.

4. Submitting final report to SBBC that will include all documents, logs, charts, photographs, and test results pertaining to each project.

SECTION 5.00 INSPECTIONS, PROJECT MANAGEMENT, AIR MONITORING, AND COMPLETION

PART 3.0 AIR MONITORING

5.3.1 General

A. The Asbestos Contractor is responsible for the personal air sampling. All other sampling will be performed by Consultant. Personal, area, and pre-encapsulation air samples will be analyzed by an NVLAP-accredited laboratory using NIOSH method 7400 using phase contrast microscopy (PCM). In some cases, PCM may be used for final air testing.

B. Final air samples will be analyzed by a laboratory accredited by NVLAP for Transmission Electron Microscopy (TEM), using the AHERA Mandatory Transmission Electron Microscopy Method in Appendix A of 40 CFR 763, subpart E.

5.3.2 Background Air Testing

A. Background Air Testing will be carried out by Consultant prior to initiation of work by Contractor in order to establish background levels of contamination.

B. During work by Contractor, if air monitoring shows an increase in airborne fiber concentrations outside containment system, work shall cease until the source of the contamination is found and remedied to Consultant's satisfaction. Any areas that have been contaminated as a result of Contractor's work shall be cleaned by Contractor.

C. Background air samples will be analyzed by PCM. TEM analysis of questionable samples will be made available at the expense of Contractor should he request it.

5.3.3 Personal Air Sampling

A. The personal air monitoring will consist of:

1. An 8-hour Time Weighted Average (TWA) for samples collected on 25% of the work force during each eight hour shift for the duration of the project.

2. Continuous personal monitoring to be conducted during preparation, removal, and final cleanup, unless Type C pressure demand respiratory protection is used.

3. Excursion Limit, or Short Term Exposure Limit (STEL) sampling, shall be performed during all phases of the asbestos abatement project to establish the STEL for each job function.

5.3.4 The Pre-encapsulation Test

A. After successful completion of the pre-encapsulation inspection, but prior to removal of the wall and floor coverings, critical barriers, decontamination unit, and use of any encapsulant, Consultant will conduct pre-encapsulation air testing.

B. This will consist of filtered air samples of sufficient volume to yield a detection limit of less than 0.01 f/cc.

1. The sampling will not begin until work area is dry.

2. Sampling will utilize aggressive techniques (a 1 HP leaf blower and electric fans) to re-suspend any dust or material that has settled in work area.

3. The pre-encapsulation air testing will be analyzed by PCM (NIOSH 7400) with a concentration of .01 f/cc being acceptable (see Section 5.3.6 for discussion of confidence limits).

5.3.5 Conditions for Final Air Testing

A. Final air testing shall take place when removal is complete, the fire-retardant polyethylene sheeting not necessary to the integrity of containment removed, and a visual inspection of work area shows that work area is clean and dry.

B. Contractor should expect a delay of at least 24 hours from the time the samples reach the laboratory to the time the results are known for all PCM analyses. Consultant will make every reasonable effort to obtain these results in a time period suitable to Contractor's work schedule.

C. Contractor should expect at least a 48 hour delay from the time the samples reach the laboratory to the time the results are known for samples analyzed by TEM. Consultant will make every reasonable effort to obtain these results in a time period suitable to Contractor's work schedule.

5.3.6 Air Clearance Criteria

A. Consultant and Contractor recognize the samples taken for all PCM clearance or pre-encapsulation samples must meet a standard that allows Consultant 95% certainty that the sample does, in fact, meet the 0.01 f/cc final air standard. Ninety-five percent certainty is defined by the equation:

MC + 1.645 (CV) (FAS) = 95% upper confidence level

where: MC = measured concentration of fibers
CV = coefficient of variation
FAS = final air standard

B. The results of this equation must be less than the final air standard for any sampled area to pass the test.

C. For samples analyzed by the Transmission Electron Microscope Method, the arithmetic mean of the measured airborne asbestos concentration for the five inside samples must be less than or equal to 70 structures/mm^2, or the average airborne asbestos concentration measured inside work area is not statistically higher than the average airborne asbestos concentration measured outside work area as determined by the statistical Z-test.

5.3.7 Final Air Testing

A. After work area has met the 0.01 f/cc standard for the pre-encapsulation test, final air testing will be conducted and analyzed by Transmission Electron Microscopy (TEM), when the amount of

ACM removed in work area is greater than 160 square feet, or 260 linear feet. Final air testing will consist of five TEM samples inside work area and five TEM samples outside work area. The sampling procedures and guidelines in EPA 40 CFR 763 part III will be followed.

B. When the amount of ACM removed in work area is less than 160 square feet or 260 linear feet, the results of the pre-encapsulation (PCM) air test will be considered as the criteria for Contractor compliance, unless TEM analysis is required by SBBC.

5.3.8 Final Air Testing: Exterior Areas

Final air testing will not be required for exterior, open work areas. Instead, a thorough and meticulous inspection will be performed by Consultant to determine Contractor compliance.

5.3.9 Final Air Testing: Glove Bag Procedure

A. Each work area in which glove bag removal has occurred will be visually inspected by Consultant prior to final air testing.

B. Aggressive sampling procedures will not be used unless work areas are fully contained by critical barriers.

C. Each work area will be tested and analyzed by the PCM method, using static sampling procedures, unless conditions allow aggressive testing (see B. above).

D. A TEM final air test of the general areas of glove bag removal may be performed at Consultant's discretion.

5.3.10 Failure of Final Air Tests

A. When the results of the final air test show values of airborne asbestos in excess of the final air standard, Contractor must re-clean work area.

B. The final air testing procedure shall then be repeated at Contractor's expense.

5.3.11 Availability of Consultant

A. Consultant will be on-site or on-call and available within 2 hours at all times.

B. Contractor must notify Consultant of work schedule at the start of the job and on a daily basis. Departures from this schedule may result in charges for waiting or unnecessary site visits and shall be charged to Contractor.

C. Departures from this schedule may result in charges for waiting or unnecessary site visits and shall be charges to Contractor.

D. Calls that require Consultant to work overtime are subject to the approval of SBBC.

SECTION 5.00 INSPECTIONS, PROJECT MANAGEMENT, AIR MONITORING, AND COMPLETION

PART 4.0 COMPLETION

5.4.1 Completion

A. Completion Criteria

1. After final inspections and final air testing are complete and the results known, Consultant will advise Contractor of the test results.

2. When a work area fails either the inspection or the final air testing, the area must be re-cleaned, re-inspected and re-tested. The sequence of re-cleaning and re-testing shall continue until the area passes the inspection and the final air test.

3. When work area has passed final air test, Contractor will be informed immediately.

B. Re-establishment of Objects and Systems

When the project is complete:

1. Relocate all objects moved to temporary locations in the course of the work to their former positions.

2. Re-establish HVAC, mechanical and electrical systems to proper working order. Install new filters on HVAC equipment.

SECTION 6.00 ALTERNATE PROCEDURES AND VIOLATIONS OF SPECIFICATIONS

This section is intended to be used as a general specification for alternate procedures for any particular asbestos abatement project for SBBC.

6.1 Alternate Procedures

A. Procedures described in this specification must be utilized at all times.

B. When specific procedures cannot be utilized, a request must be made in writing to Consultant providing details of the problem encountered and recommended alternatives.

C. Alternative procedures must provide equivalent or greater protection than procedures that they replace.

D. Any alternative procedure must be approved in writing by Consultant prior to implementation.

6.2 Violations of Specifications

A. SBBC will enforce these specifications through Consultant.

B. SBBC authorizes Consultant to issue cease work orders upon discovery of any violation of these specifications.

C. Minor infractions of the specifications may result in cessation of work until the infraction is corrected.

D. Major violations of this specification may result in the dismissal of the Contractor from all asbestos abatement work, and application of liquidated damages as stated and agreed to by Contractor in contract documents.

SECTION 7.00 EMERGENCY PLANNING

7.1 Emergency Planning

A. Emergency planning must be developed by Contractor and approved by SBBC and Consultant.

B. Emergency procedures must be in written form and prominently posted in clean room and equipment room of worker decontamination unit. Prior to entering work area everyone must read and sign these procedures to acknowledge receipt and understanding of work site layout, location of emergency exits, and emergency procedures.

C. Emergency planning must include:

1. Written notification of police, fire and emergency medical personnel of planned abatement activities, work schedule, and layout of work area.

2. An employee safety meeting must be conducted by Contractor prior to the commencement of work. The meeting shall be attended by all Contractor employees on site, and Consultant. All aspects of emergency planning shall be covered in the meeting.

3. Access to fire extinguishers both inside and outside the work area.

D. Emergency planning must include:

1. Considerations of fire, explosion, toxic atmospheres, electrical hazards, slips, falls and trips, confined spaces and heat related injury.

2. A copy of the emergency procedures and evidence employee training in these procedures shall be provided to Consultant.

E. Evacuation and Emergency Decontamination Procedures

1. Employees must be trained in evacuation procedures in the event of workplace emergency.

2. For non life-threatening situations, employees injured or otherwise incapacitated must decontaminate following normal procedures, with assistance from fellow workers if necessary, before exiting the workplace to obtain proper treatment.

3. For life-threatening injury or illness, worker decontamination shall take least priority after measures to stabilize the injured worker, remove him/her from the workplace and secure proper medical treatment.

F. Telephone numbers of all emergency response personnel must be prominently posted in clean room and equipment room, along with the location of the nearest telephone and hospital emergency room.

SECTION 8.00 FIRE SAFETY AND SAFE EGRESS

PART 1.0 FIRE PROTECTION AND PREVENTION

8.1 GENERAL REQUIREMENTS

8.1.1 Fire Protection Program

A. Contractor shall be responsible for the development of a fire protection program to be followed throughout all phases of demolition and abatement work, and shall provide firefighting equipment as specified in this section.

B. As fire hazards occur, there shall be no delay in providing the necessary equipment.

8.1.2 Fire Extinguishers

A. Contractor shall provide a fire extinguisher with current inspections and tags in accordance with 29CFR1910.157, rated not less than 2A, for each 3,000 square feet of demolition/abatement work area.

B. Travel distance from any point of the protected area to the nearest extinguisher shall not exceed 100 linear feet. This distance shall decrease in areas of limited mobility.

C. A fire extinguisher may be substituted with a 1/2" diameter garden hose not exceeding 100 linear feet in length.

D. Contractor shall ensure that all employees have been instructed in the general use of fire extinguishers and the hazards involved with their use.

8.1.3 Sprinkler Systems

A. During renovation, abatement, or alterations, the existing fire sprinkler system shall be maintained in service at all times.

B. If building is scheduled for complete demolition, existing sprinkler system shall be retained in service as long as reasonable.

8.1.4 Fire Alarm Devices

An alarm system consisting of an active telephone system and warning alarm (e.g. siren) shall be established by Contractor to alert workers and fire department in case of fire emergency.

SECTION 8.00 FIRE SAFETY AND SAFE EGRESS

PART 2.0 SAFE EMERGENCY EGRESS

8.2 GENERAL REQUIREMENTS

8.2.1 Application

This part contains general fundamental requirements essential to providing a safe means of egress from fire and similar emergencies. Nothing in this part shall be construed to prohibit a better type of containment construction, more exits, or otherwise safer conditions than the minimum requirements specified in this part.

8.2.2 Fire Alarm Facilities

A. In each work area, provide fire alarm facilities to workers and other building occupants so they may escape.

B. These fire alarm facilities shall be provided where necessary to warn worker and building occupants of the existence of fire, as a fire itself may not provide adequate warning.

8.2.3 Protection of Workers and Building Occupants

A. No existing building shall be occupied during demolition/abatement unless all existing exits and any existing fire protection are continuously maintained, or in lieu thereof, other measures are taken to provide equivalent safety.

B. No flammable or explosive substances or equipment for demolition/abatement shall be introduced in a building of normally low or ordinary hazard classification while building is occupied, provided the condition of use and safeguards do not create any additional danger or handicap to egress beyond the normally permissible conditions in the building or work area.

C. Each exit, way of approach, and way of travel from an exit to the street or open space shall be continuously maintained free of all obstruction or impediments to instant use in the case of fire or other emergency.

SECTION 8.00 FIRE SAFETY AND SAFE EGRESS

PART 3.0 MEANS OF EGRESS

8.3.1 Definitions

A. Exit Access: Exit access is that portion of a means of egress that leads to an exit.

B. An Exit: An exit is that portion of a means of egress that is separated from all other spaces of demolition/abatement or equipment as a way of travel to the street or open area.

C. High Hazard Contents: High hazard contents shall be classified as those materials, substances, or equipment that are able to rapidly burn or from which toxic fumes or explosions may occur in the event of fire.

8.3.2 Means of Egress

A. A door from a work area to an exit or to a way of exit access shall be of the side-hinged, swinging type. It shall swing in the direction of exit travel.

B. The minimum width of any way of exit access shall in no case be less than 28 inches. Where a single way of exit access leads to an exit, its capacity in terms of width shall be at least equal to the required capacity of the exit to which it leads. Where more than one way of exit access leads to an exit, each shall have a width adequate for the number of persons it must accommodate.

8.3.3 Emergency Exits

A. For each work area, Contractor shall provide an alternate emergency exit.

B. The alternate emergency exit shall consist of a door that leads to a way of exit access. The door shall be sealed with duct tape, and covered with fire-retardant polyethylene sheeting.

C. Fire-retardant polyethylene sheeting covering the emergency exit shall be clearly outlined and attached in a manner that allows "tear away" in case of emergency and marked as an emergency exit. A utility knife shall be permanently attached to the fire-retardant polyethylene sheeting to provide access to the emergency exit.

D. Contractor shall install arrows throughout the work area at 2 feet and 5 feet above the floor indicating the direction to the nearest exit.

8.3.4 Emergency Lighting

A. In case of electrical failure during fire, Contractor shall provide battery-operated lights or lamps in the work area.

B. There shall be at least one battery-operated light or lamp every five workers present in the work area.

CERTIFICATE OF WORKER TRAINING

PROJECT NAME: _____ DATE: _____

PROJECT ADDRESS: _____

CONTRACTOR'S NAME: _____

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

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

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

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

- Physical characteristics of asbestos
- Health hazards associated with asbestos
- Respiratory protection
- Use of protective equipment
- Negative air/pressure differential Systems
- Work practices including hands on or on-job training
- Personal decontamination procedures
- Air monitoring, personal and area

This training will meet all requirements of the Asbestos Hazard Emergency Response Act.

_____ _____

Print Name Worker's Signature

CERTIFICATE OF WORKER'S RELEASE

DATE:_____

TO: _____

RE:_____
(Insert project name and address)

1. In consideration of my employment by_____
(Contractor)
in connection with the removal and disposal of asbestos, or other work in asbestos-contaminated work areas, and in consideration of the sum of: **ONE AND NO/100 ($1.00) DOLLAR** and other good and valuable consideration in hand paid, at and before the sealing and delivery of these presents, the receipt, sufficiency, and adequacy of which are hereby acknowledged, the undersigned does hereby acknowledge, warrant, represent, covenant, and agree as follows:

   (a) I acknowledge and understand that I have been or will be employed in connection with the removal of, disposal of, or other work in asbestos-contaminated work areas, and I acknowledge that I have been advised of and I understand the dangers inherent in handling asbestos and breathing asbestos dust, including, but not limited to, **THE FACT THAT ASBESTOS CAN CAUSE ASBESTOSIS AND IS A KNOWN CARCINOGEN AND CAN, THEREFORE, CAUSE VARIOUS TYPES OF CANCER.**

   (b) I acknowledge and understand that **ANY CONTACT WITH ASBESTOS, WHETHER IT CAN BE SEEN OR NOT, MAY CAUSE ASBESTOSIS AND VARIOUS FORMS OF CANCER, WHICH MAY NOT SHOW UP FOR MANY YEARS,** and I covenant and agree faithfully to take all precautions required of me.

   (c) I knowingly assume all risks in connection with potential exposure to asbestos and I do hereby covenant not to sue, and to release and forever discharge the Owner, Consultant, Testing Laboratory or architects and engineers employed by Owner, Consultant, or Testing Laboratory and all their directors, officers, employees, nominees, personal representatives, affiliates, successors, and assigns for, from and against any and all liability whatsoever, at common law or otherwise, except any rights which the undersigned may have under the provision of the applicable workmen's compensation laws. Except as specifically set forth herein I hereby waive and relinquish any and all claims of every nature which I now have or may have or claim to have which are in any way, directly or indirectly, related to exposure to asbestos and asbestos-containing materials.

_____ _____
Print Name Signature of Worker

(as acknowledgment of reading this page 1 of this two-page Certificate)

(d) I hereby warrant and represent that I have not been disabled, laid-off, or compensated in damages or otherwise, because of the disease of asbestosis.

(e) I represent that I can read the English language, or that I have had someone read this instrument to me, and that I understand the meaning of all the provisions contained herein.

Signature:_____

Social Security Number:_____

Signed in the presence of _____

Notary _____
(Signature)

My Commission Expires _____

( )
( )
(Seal)
( )
( )

RESPIRATOR TRAINING CERTIFICATION

I hereby certify that I have been trained in the use of each type of respiratory protection equipment required for use on this Project. The training included the following:

1. Explanation of the dangers related to misuse.
2. Instruction on putting on, fitting, testing, and wearing the respirator.
3. Instruction on inspection, cleaning, and maintaining respirator.
4. Instruction on emergency situations.

I further certify that I understand the use, care and inspection of the respirator, and have tested and worn the unit.

Employee Signature:_____

Date: _____

Notary: _____
Signature

My Commission Expires _____

( )
( )
(Seal)
( )
( )

(Submit one copy for each employee prior to starting work)

SUPERVISOR DAILY WORK LOG Page 1 of

DATE:_____

DESCRIPTION OF WORK TO BE PERFORMED: _____

_____

_____

WORKERS ON-SITE:

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

CONTAINMENT INSPECTIONS:

TIME COMMENTS

_____

_____

_____

_____

_____

COMMENTS:

_____

_____

_____

_____

_____

SUPERVISOR DAILY WORK LOG Page 2 of

DATE: _____

COMMENTS:

_____
_____
_____
_____
_____

WASTE REMOVAL:

_____
_____
_____
_____
_____

ATTACHED RECEIPTS:

[ ] Chart recording from manometer

[ ] Air monitoring results from Consultant

[ ] Dump receipts from landfill

Name of Supervisor:_____

Signature:_____

SUPERVISOR DAILY WORK LOG

Page _of _ **CONTAINMENT ENTRY LOG**

Date:_____

Name	Affiliation	Respirator	Time In	Time Out

Name of Supervisor:_____

Signature:_____

Contractor Certification of Compliance with 40 CFR 763.100 et seq.

Pursuant to the written agreement by and between Owner, and the U.S. ENVIRONMENTAL PROTECTION AGENCY, CONTRACTOR specified hereon is required to certify within five (5) work days of completion of the project that CONTRACTOR has conducted the asbestos removal in accordance with 40 CFR S763.100 *et seq.*

Further, that CONTRACTOR has complied with, and enforced, all applicable federal, regional, state, and local regulations for asbestos abatement, worker protection, and disposal of asbestos-containing materials.

Further, CONTRACTOR certifies that all asbestos-containing material, related to the scope of the project, has been removed.

CONTRACTOR: REMOVAL PROJECT:

_____ _____

The undersigned, a principal of CONTRACTOR, attests to the foregoing:

for CONTRACTOR _____(LS)

Title: _____ Date: _____

WITNESS:

_____ Date:_____

Contact:_____

AFFIDAVIT

I,_____, representing_____
_____ hereinafter known as CONTRACTOR attest that the attached is a true and accurate copy of the notice of intent to renovate or demolish to the Florida Department of Environmental Regulation for asbestos abatement activity described below:

[Enter name of facility and a description of the materials to be abated, including location]

This notice was made on [date] _____
I am authorized to act in behalf of CONTRACTOR to issue such notices.

Signature_____

Title:_____

Received by:

_____

Title:_____

Date:_____ Time:_____