1.1 DESCRIPTION

A. Work included: Contractor shall furnish all labor, materials, services, permits, insurance (specifically covering the abatement, handling, and transportation of Asbestos-Containing Material, Asbestos-Containing Construction Material and Asbestos-Containing Waste Material), and equipment which is specified, shown, or reasonably implied for Asbestos Abatement activities specified in Section 07530.

B. Applicable Publications: The publications listed below form a part of these Specifications to the extent referenced. The publications are referred to in the text by the basic designation only.

   - 29 CFR 1910.1001 Occupational Exposure to Asbestos, Tremolite, Anthophyllite and Actinolite
   - 29 CFR 1910.1101 Asbestos
   - 29 CFR 1910.1200 Hazard Communication
   - 29 CFR 1910.20 Access to Employee Exposure and Medical Records
   - 29 CFR 1910.132 General Requirements - Personal Protective Equipment
   - 29 CFR 1910.133 Eye and Face Protection
   - 29 CFR 1910.134 Respiratory Protection
   - 29 CFR 1910.145 Specifications for Accident Prevention, Signs and Tags
   - 29 CFR 1926.58 Asbestos, Tremolite, Anthophyllite and Actinolite
   - 40 CFR 61, Subpart A General Conditions
   - 40 CFR 61, Subpart M National Emission Standards for Asbestos

2. American National Standard Institute (ANSI) Publications:
   - Z9.2-1979 Fundamentals Governing The Design and Operation of Local Exhaust Systems
   - Z88.2-1980 Practices for Respiratory Protection

   - Standard 90A Installation of Air Conditioning and Ventilation Systems.

4. U. S. Environmental Protection Agency (EPA):

5. American Society for Testing Materials (ASTM) Publications:
   - E 849-82 Safety and Health Requirements Relating to Occupational Exposures to Asbestos
   - P-189 Specifications for Encapsulants for Friable Asbestos-Containing Materials

6. National Institute of Occupational Safety and Health (NIOSH) Publications:
1.2 DEFINITIONS

A. Owner: County of San Joaquin

B. Abatement: Procedures to control fiber release from Asbestos-Containing building materials. Includes required removal, encapsulation, and enclosure.

C. Action Level: Airborne concentration of asbestos, Tremolite, Anthophyllite, Actinolite, or a combination of these minerals of 0.1 fibers per cubic centimeter (f/cc) of air calculated as an eight (8)-hour time-weighted average (TWA)

D. Air Lock: A system for permitting ingress and egress with minimum air movement between a contaminated area and an uncontaminated area. (See Decontamination Enclosure System Plan in the Drawing section of this Project Manual)

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

F. Air Sampling Professional: The professional contracted or employed to supervise air monitoring and analysis schemes. This individual is also responsible for recognition of technical deficiencies in Worker protection equipment and procedures during both planning and on-site phases of an Abatement Project. Acceptable Air Sampling Professionals include Industrial Hygienists, Environmental Engineers and Environmental Scientists with equivalent experience in Asbestos air monitoring and Worker protection.

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

H. Area Monitoring: Sampling of airborne fiber concentrations within the Asbestos Work Area and outside the Asbestos Work Area which are representative of the airborne concentrations of Asbestos fibers which may reach the breathing zone.

I. Asbestos: (29 CFR 1926.58 Definitions) Includes Chrysotile, Amosite, Crocidolite, Tremolite asbestos, and any of these minerals that has been chemically treated and/or altered.

J. Asbestos (California Code of Regulations definitions): Means fibrous forms of various hydrated minerals including Chrysotile, (fibrous serpentine), Crocidolite (fibrous Riebeckite), Amosite (fibrous Cummingtonite-Grunerite), Fibrous Tremolite, fibrous Actinolite, and fibrous Anthophyllite.

K. Asbestos-Containing Material (ACM) EPA definition: Material composed of asbestos of any type in an amount greater than 1 percent and by weight, either alone or mixed with other fibrous or nonfibrous materials.

L. Asbestos-Containing Construction Material (California definition): Means any manufactured construction material which contains more than 1/10th of 1% asbestos by weight.

M. Asbestos-Containing Waste Material: Means friable asbestos waste and asbestos waste from control devices (Pollution Control Devices).

N. Asbestos Fibers: Asbestos fibers having an aspect ratio of at least 3:1 and 5 micrometers in length.
O. **Authorized Visitor:** The Owner's Project Team members, the Owner's Representative, Observation Service and any representative of a regulatory or other agency having jurisdiction over the Project.

P. **Clean Room:** An uncontaminated area or room which is a part of the Worker Decontamination Enclosure with provisions for storage of Workers' street clothes and protective equipment.

Q. **Contained Work Area:** A Work Area which has been Isolated, Plasticized, and equipped with a Decontamination Enclosure System.

R. **Curtained Doorway:** A device to allow ingress or egress from one area to another while permitting minimal air movement between the areas, typically constructed by placing three overlapping sheets of plastic over an existing or temporarily framed doorway, securing each along the top of the doorway, and securing the vertical edge of the outer two sheets along the opposite vertical side of the doorway (see detail on Decontamination Enclosure System Plan in the Drawing section of this Project Manual.)

S. **Decontamination Enclosure System:** A series of connected rooms, with Air Locks or Curtained Doorways between any two adjacent rooms, for the decontamination of Workers and of materials and equipment. A Decontamination Enclosure System always contains at least one Air Lock to the Work Area (see standard Decontamination Enclosure System Plan in the Drawing section of this Project Manual.)

T. **Encapsulant (sealant):** A liquid material which can be applied to Asbestos-Containing material and which 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).

U. **Encapsulation:** All herein-specified procedures necessary to apply an encapsulant to Asbestos-Containing building materials to control the possible release of Asbestos fibers into the ambient air.

V. **Enclosure:** All herein-specified procedures necessary to enclose completely Asbestos-Containing Material behind airtight, impermeable, permanent barriers.

W. **Excursion Limit:** An exposure of airborne concentrations of Asbestos fibers of one fiber per cubic centimeter of air (1f/cc) as averaged over a sampling period of thirty (30) minutes.

X. **Equipment Room:** A contaminated area or room which is part of the Worker Decontamination Enclosure with provisions for storage of contaminated clothing and equipment.

Y. **Equipment Decontamination Enclosure:** That portion of a Decontamination Enclosure System designed for controlled transfer of materials, waste containers and equipment, typically consisting of a Washroom and a Holding Area.

Z. **Friable Asbestos Material** (40 CFR, Subpart M Definition): Material that contains more than one percent (1%) Asbestos by weight and that can be broken, crumbled, pulverized, or reduced to powder by hand pressure when dry.

AA. **Fixed Object:** A unit of equipment or furniture or other building component which cannot be detached from the building or can only be detached by destructive methods resulting in irreparable damage to the item.

AB. **Glovebag Method:** A method with limited applications for removing small amounts of friable Asbestos-Containing material from HVAC ducts, short piping runs, valves, joints, elbows, and other nonplanar surfaces in an Isolated (non-contained) Work Area. The glovebag (typically constructed of six [6] mil transparent Regulite plastic) has two inward-projecting long sleeve rubber gloves, one inward-projecting water wand sleeve, an internal tool pouch, and an attached, labeled receptacle for Asbestos waste. The glovebag is constructed and installed in such a manner that it surrounds the object or area to be decontaminated and contains all Asbestos fibers released during the removal process. All Workers who are permitted to use the Glovebag Method must be highly trained, experienced, and skilled in this method.
AC. **HEPA Filter:** A high efficiency particulate air (HEPA) filter capable of trapping and retaining 99.97 percent of all monodispersed particles (Asbestos fibers) equal to or greater than 0.3 microns in mass median aerodynamic equivalent diameter.

AD. **HEPA Vacuum Equipment:** Vacuuming equipment with a HEPA filter system.

AE. **Holding Area:** A room in the Equipment Decontamination Enclosure located between the Washroom and an uncontaminated area. The Holding Area comprises an Air Lock.

AF. **Isolation:** The sealing of all openings into a Work Area.

AG. **Isolated (non-contained) Work Area:** A Work Area which is Isolated, but has not been Plasticized and may or may not be equipped with a Decontamination Enclosure System.

AH. **Maximum Acceptable Level:** An exposure of airborne concentrations of fibers of 0.05 fibers per cubic centimeter of air at any time. This level is a contractual standard for this Project.

AI. **Moveable Object:** A unit of equipment, furniture or other building component which is detached or can be detached from the building without destructive methods or results.

AJ. **Negative Air Pressure Equipment:** A portable local exhaust system equipped with HEPA filtration and capable of maintaining a constant, low velocity air flow into contaminated areas from adjacent uncontaminated areas.

AK. **Nonfriable Asbestos-Containing Material:** Material that contains more than one (1) percent Asbestos by weight in which the fibers have been locked in by a bonding agent, coating, binder, or other material so that the Asbestos is well bound and will not release fibers during any appropriate end-use, handling, demolition, storage, transportation, processing, or disposal.

AL. **Observation Service:** The agent of the Owner or the Owner's Representative who shall observe the Work, perform tests, verify that abatement methods and procedures specified by the Contract Documents are being complied with, and reports all observations and test results to the Owner or the Owner's Representative.

AM. **Permissible Exposure Limit (PEL):** An airborne concentration of asbestos, Tremolite, Anthophyllite, Actinolite, or a combination of these minerals in excess of 0.2 fibers per cubic centimeter of air as an eight (8) hour time-weighted average (TWA), as determined by the method prescribed in Appendix A of Section Five, Part 1925(amended) §1926.58 (c).CFR.

AN. **Personal Monitoring:** Sampling of Asbestos fiber concentrations within the breathing zone of an Asbestos Worker.

AO. **Plasticize:** To cover floors, walls and other structural elements of a Work Area with plastic sheeting as herein specified with all seams securely taped.

AP. **Removal:** All herein-specified procedures necessary to remove Asbestos-Containing materials from the designated areas and to dispose of these materials at an acceptable site.

AQ. **Shower Room:** A room between the Clean Room and the Equipment Room in the Worker Decontamination Enclosure with hot and cold or warm running water, and suitably arranged for complete showering during decontamination. The Shower Room comprises an Air Lock between contaminated and clean areas.

AR. **Surfactant:** A chemical wetting agent added to water to reduce surface tension and improve penetration.

AS. **Washroom:** A room between the Work Area and the Holding Area in the Equipment Decontamination Enclosure System where equipment and waste containers are decontaminated. The Washroom comprises an Air Lock.

AT. **Wet Cleaning:** The process of eliminating Asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning tools which have been dampened with water, and by afterwards disposing of these cleaning tools as Asbestos-contaminated waste.
**AU. Work Area (Also known as "Regulated Area"):** Designated rooms, spaces, or areas of the Project in which Asbestos Abatement actions are to be undertaken or which may become contaminated as a result of such abatement actions. A Contained Work Area is a Work Area which has been Isolated, Plasticized, and equipped with a Decontamination Enclosure System. An Isolated (non-contained) Work Area is a Work Area which is isolated, but has not been Plasticized and may or may not be equipped with a Decontamination Enclosure System.

**AV. Worker Decontamination Enclosure System:** That portion of a Decontamination Enclosure System designed for controlled passage of Workers, and other personnel and Authorized Visitors, typically consisting of a Clean Room, a Shower Room, and an Equipment Room.

### 1.3 QUALITY CONTROL

A. **Safety Compliance:** In addition to detailed requirements of this Specification, comply with laws, ordinances, rules, and regulations of federal, state, regional, and local authorities and publications regarding handling, storing, transporting, and disposing of Asbestos Waste materials. Submit matters of interpretation of standards to the appropriate administrative agency for resolution before starting the Work. Where the requirements of this Specification and referenced documents vary, the most stringent requirement shall apply. When requirements of reference documents vary, the most stringent requirement shall apply.

B. Contractor shall have at least one copy each of 29 CFR Part 1910 - Occupational Safety and Health Standards, 29 CFR 1926.58, 40 CFR Part 61, Subparts A & M, and all pertinent state and local regulations at his office and at the job site.

C. Before the commencement of any work at the site, the Contractor shall post bilingual (as appropriate) EPA and OSHA caution signs in and around the Work Area to comply with EPA and OSHA regulations.

D. Area Monitoring shall be performed by the Observation Service, which will conduct air sampling of the Abatement Project (1) inside the building, (2) adjacent to the Work Area, (3) at the Work Area.

E. Personal Monitoring and other monitoring, which are required by law, or considered necessary by the Contractor for Worker protection shall be the responsibility of the Contractor.

F. **Job Walk:** The Abatement subcontractor must attend the Pre-bid Conference to qualify to bid on any or all portions of this Contract.

### 1.4 SUBMITTALS AND NOTIFICATIONS

A. **Personnel Training:** If requested by the Owner, Contractor shall submit (1) declaration certifying that all Contractor's employees have been adequately trained, and (2) a photocopy of training certificates for each employee from their respective training agency or organization. When certified or other formal worker training is required by state or local agencies, Contractor may submit a photocopy of the employee's Asbestos Worker Certification card in lieu of training certificates. On school (K-12) contracts submit photocopies of AHERA training and refresher course certificates for each employee.

B. **Respirators:** If requested by the Owner, provide manufacturer's certification that the respirators to be used in this Project comply with government agency requirements. Contractor's certifications for each employee must clearly state that each employee has been fit tested and properly trained for respirators.

C. **Medical Examinations:** If requested by the Owner submit proof that all persons providing labor and/or professional services who will be entering contaminated areas have had current (less than one year prior to the date of their participation on the Project) medical examinations. Furnish physician's interpretation of said examinations to the Owner at the Preconstruction Meeting, or prior to that person's commencing work on this Project, and for each person subsequently providing labor and/or professional services at the job site.

D. **Product Submittals and Substitutions:** Comply with pertinent provisions of General Conditions.
E. **Abatement Product Data:** Within ten (10) days after Contractor has received the Owner's Notice to proceed, submit manufacturer's catalogue, samples, Material Data Safety Sheets, (MSDS) and other items needed to demonstrate fully the quality of the proposed abatement materials. Under no circumstances shall proposed materials be used before written approval from the Owner, Owner's Representative or Observation Service. Submittals are required if the following materials are proposed (not necessarily a complete list.) Do not submit data on products not proposed for this project:
1. Encapsulant
2. Surfactant
3. Protective packaging
4. Lagging adhesive
5. Glovebags
6. Resaturant
7. Solvents

F. **Permits:** Contractor shall be responsible for any necessary permits. At the Preconstruction Meeting, Contractor shall submit proof satisfactory to the Owner's Representative that all required permits have been obtained. If no permits are required, submit notarized letter stating such.

G. **Waste Transportation:** Submit at Preconstruction Meeting the method of transport of Hazardous Waste, including the name, address, EPA ID number, and telephone number of the Transporter(s).

H. **Hazardous Waste Disposal Facility:** Submit for approval at the Preconstruction Meeting the name, address, EPA ID number, and telephone number of the Hazardous Waste Disposal Facility(s) to be used.

I. **Asbestos Plan:** Submit at the Preconstruction Meeting for approval a detailed plan of the work procedures to be used in the removal, repair, clean-up or encapsulation of materials containing Asbestos. Such a plan shall include:
1. Location of Asbestos Work Areas.
2. Layout and construction details of Abatement Plans.
3. Project schedule including important milestones, critical paths and interface of trades involved in the Work.
4. Personal air monitoring procedures.
5. Detailed description of the method to be employed in order to control pollution.
6. Names of Superintendent, Foremen, Project Manager and other key personnel, and their day time and emergency telephone numbers.
7. Security Plan including sketches necessary to clearly describe the plan.
8. Emergency evacuation plan for injured workers, compressor failure, fire and other emergencies.
9. A contingency plan, in the event of a major contamination incident caused by fire, a large breech in the Work area containment barrier, breakage of the building’s exterior windows or sabotage. Such a plan will focus on how to maintain safety and order when the building is fully occupied by office employees and other building users.
10. The Asbestos Plan must be approved in writing by the Observation Service and Owner before the start of any work.

J. **Equipment Certification:** Submit at Preconstruction Meeting the legally required manufacturers’ certification that vacuums, negative air pressure equipment filters, and other local exhaust ventilation equipment conform to ANSI Z9.2-1979.
K. **Notifications**: Contact the required government agencies in writing postmarked or delivered at least ten (10) days prior to Project commencement.

All notifications shall contain as a minimum the following information:

1. Name, address and telephone number of the Owner including the contact person.
2. Name, address, EPA numbers, license number and telephone number of the Contractor including the contact person.
3. Name, address and description of the building, including size, age, and prior use of building.
4. The type and quantity of friable Asbestos material involved and the description of the Work.
5. Scheduled starting and completion dates for Abatement Work.
6. Procedures that shall be employed to comply with the regulations.
7. The name, address, EPA number and telephone number of the Transporter.
8. The name and address of the Hazardous Waste Disposal Facility where the Asbestos Waste shall be deposited.

Copies of all government agency correspondence and proof of delivery shall be delivered to the Observation Service at the Preconstruction Meeting. **NOTE**: No work shall commence until verification of required notifications is made by the Observation Service.

L. Provide proof of Contractor's License and Asbestos Certification from the Contractor Licensing Board, and proof of registration with the Division of Occupational Safety and Health in accordance with California Labor Code, Section 6501. Submit proof with Bid.

M. Encapsulant manufacturer's certification (when required) that the Contractor is an approved applicator of the encapsulants to be used on this project.

### 1.5 ADMINISTRATION OF THE CONTRACT

A. All Work is to be performed under the observation of the Observation Service and the Owner's Representative, who shall be free to enter and review all Work (see Section 02014 Hazardous Material Abatement Observation Services).

### 1.6 SAFETY

A. Submit at the Preconstruction Meeting written procedures for evacuation of injured Workers. Aid for seriously injured Workers shall not be delayed in order to comply with standard decontamination procedures. It is the responsibility of the Contractor to decide if the seriousness of the injury warrants noncompliance with the standard decontamination procedures.

### PART 2 - WORKER PROTECTION

#### 2.1 TRAINING PROGRAM

A. Each employee shall receive training in the proper handling of materials that contain Asbestos, including all aspects of work procedures and protective measures, use of protective clothing and respiratory protection, on use of showers, on entry and exit procedures from Work Areas and in OSHA regulations. All workers who are scheduled to use the Glovebag Method must be highly trained, experienced and skilled in this method. Each employee shall also understand the health implications and risks involved, including the illness possible from exposure to airborne Asbestos fibers and the increased risk of lung cancer associated with smoking cigarettes.
and Asbestos exposure, understand the use and limits of the respiratory equipment to be used, and understand the purpose of medical surveillance and the monitoring of airborne quantities of Asbestos as related to health and respiratory equipment. The training program shall comply with federal, state or local regulatory requirements.

B. Emergency evacuation procedures to be followed in the event of Worker injury or compressor failure shall be included in Worker Training program.

2.2 DRESS AND EQUIPMENT

A. Work clothes shall consist of those necessary to adequately protect workers. The clothes provided must confirm to all local, state, and federal regulations for Abatement of this type.

B. Eye protection and hard hats shall be available as appropriate or as required by applicable safety regulations.

C. Provide Authorized Visitors with suitable protective clothing, headgear, eye protection, and footwear whenever they are required to enter the Work Area.

2.3 RESPIRATORS

A. Respiratory protective equipment shall be MSHA/NIOSH approved in accordance with the provisions of 30 CFR Part 11 unless superceded by local regulations with more stringent requirements.

2.4 WORKER PROTECTION PROCEDURES - TO BE POSTED IN CLEAN ROOM

Bilingual (English and other appropriate language[s]) Worker Protection Procedures must be posted. If the first language of all Workers is English, the bilingual procedures are excepted.

A. All Workers shall, each time they leave the Work Area: remove gross contamination from clothing before leaving the Work Area; proceed to the Equipment Room and remove all clothing except respirators; still wearing the respirator, proceed naked to the showers; clean the outside of the respirator with soap and water while showering; remove the respirator; thoroughly shampoo and wash themselves.

2.5 MEDICAL EXAMINATIONS AND HISTORIES

A. Before exposure to airborne Asbestos, the Contractor will provide each employee providing labor or professional services at the Project site with a current comprehensive medical exam, including a history of respiratory and gastrointestinal diseases, meeting the general definition outlined in 29 CFR 1910.1101, 29 CFR 1910.134, [and] 29 CFR 1926.58 [and California Administrative Code Title 8, CAC Section 5208, page 442.2.1 part (1)]. A current Medical Examination report will be accepted. The medical report shall contain a statement from the examining physician that the employee can (or cannot) function normally wearing a respirator or that the safety or health of the employee or other employees will or will not be impaired by his use of a respirator. No employee will be allowed to enter the Work Area without having first provided a copy of their Medical Examination, to the Owner’s Representative and until the submitted form or medical has been approved by the Observation Service.

PART 3 - PRODUCTS

3.1 GENERAL

A. Contractor shall furnish, provide and utilize the following products in the Work as specified.

B. See Section 02012 Product Handling in Division-1 of these Specifications.

3.2 PROTECTIVE PACKAGING

A. Appropriately labeled clear, double six (6) mil sealable polyethylene bags as a minimum.

B. Appropriately labeled, sealable, impermeable drum containers.
C. Bilingual labels (English and other appropriate language[s]) on containment glovebags, waste packages, contaminated material packages and other containers shall be in accordance with EPA or OSHA standards.

3.3 WARNING LABELS AND SIGNS

3.4 SURFACTANT
A.Surfactant, or wetting agent, for amending water will be 50 percent polyoxyethylene polyglycol ester and 50 percent polyoxyethylene ether, or equivalent, at a concentration of one (1) ounce per five (5) gallons of water.

3.5 GLOVEBAGS
A. The glovebag (typically constructed of six [6] mil transparent regulate plastic) has two (2) inward-projecting longsleeve rubber gloves, one (1) inward-projecting water wand sleeve, an internal tool pouch, and an attached labeled receptacle for Asbestos Waste.

3.6 TOOLS AND EQUIPMENT
A. Provide suitable tools for Asbestos removal and encapsulation.

3.7 LUMBER
A. Shall be flame retardant and carrying markings certifying such properties.

3.8 SOLVENTS
A. Shall be non-toxic, non-carcinogenic, nonflammable (flash-point in excess of 200¡ F.), nonreactive with or damaging to materials it will come in contact with and approved for indoor use by regulatory agencies. Provide ventilation of Work Area as required by manufacturer. Vent exhaust to the exterior of the building and in a manner that will not result in adverse affects to other areas of the facility, adjacent facilities or public areas.

PART 4 - EXECUTION

4.1 WORK AREA PREPARATION
A. Preparation procedures for removal of friable materials, including thermal system insulation, exterior stucco, wall texture coating and sheet flooring backing:
   1. Removal of the above or other friable Asbestos-Containing materials, unless specified otherwise, shall be executed in a "Contained" Work Area.
   2. Contractor shall isolate the Work Area for the duration of the Project, completely sealing all openings including, but not limited to, HVAC ducts, diffusers and grilles, skylights, doorways, and windows, with six (6) mil polyethylene taped securely to a clean surface. Spray adhesive used on finished surfaces should be avoided where possible. Construct exterior barriers with wood or metal framing members and sheathed with 3/8" min. plywood.
   3. HVAC systems shall be shut down by Owner.
   4. Contractor shall remove all salvageable Movable Objects from the Work Area that are vulnerable to damage or contamination, or that will impede or prevent the completion of the Work. All Movable Objects deemed salvageable by the Owner to be removed from the Work Area shall be cleaned before being moved to the designated storage area.
5. Clean and cover all Fixed and Movable Objects that can remain in the Work Area with six (6) mil polyethylene sheeting taped securely in place. Special precautions shall be taken to protect salvageable Fixed Objects vulnerable to damage or contamination.

6. All salvageable Fixed and Movable Objects requiring cleaning shall be washed with amended water or cleaned with a HEPA filtered vacuum.

7. Seal and protect all salvageable light fixtures, computer systems, communication systems, lighted exit signs and other electrical items, etc., that will remain within the Work Area with six (6) mil polyethylene taped securely. The polyethylene cover shall be kept away from heat-generating electrical devices where fire or damage to the device is possible. Salvageable light fixtures and all other electrical items shall be thoroughly cleaned before covering. Make waterproof all electrical conduit connections and other electrical devices that will be exposed to moisture.

8. Clean the proposed Work Areas of suspect visible debris before plasticizing floors and walls, using HEPA vacuum equipment or wet-cleaning methods as appropriate. Do not use methods that raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters.

9. Work Area (Containment): Contractor shall cover entire floor with a minimum of two (2) six (6) mil protective coverings. Cover wall, ceiling and column surfaces with a minimum of two (2) four (4) mil protective covering. Floor coverings shall extend a minimum of 12" up vertical surfaces and behind wall covers. All seams shall be staggered and securely taped.

10. Install 2' x 2' plexiglass observation window(s) at strategic location(s) in the "Containment" barrier to allow observation of work from outside the Work Area.

11. Seal all wall, plumbing, duct and other cavities to prevent Asbestos materials from falling into such cavities during the Work.

12. The Contractor shall check regularly (at beginning, middle and end of each shift as a minimum) all polyethylene isolation and containment (protective) barriers for punctures, loose seals, contact with heat-generating devices, etc. Problem areas shall be repaired or mended immediately.

13. Maintain existing emergency exits from the building. Maintain a minimum of two (2) exits from Work Areas where possible. The first exit shall be the Worker the Decontamination Enclosure System. The second exit may be the Equipment Decontamination Enclosure System or a ripcord type, emergency only exit in the plastic containment at a door, window or other appropriate location. Exits, where possible, shall be on opposite ends of the Work Area. All exits shall be labeled in bright letters or signage. The second exit shall be labeled "Emergency Exit Only." Establish alternative exits satisfactory to fire officials where existing building or Work Area emergency exits are unavoidably blocked by activities of this project.

14. Provide and maintain appropriate fire extinguisher inside and outside the Work Area. [One 30-pound type "ABC" fire extinguisher is required for each 2,000 sq. ft. of floor area.]

15. Install and maintain temporary emergency exit lighting with battery backup power in all Work Areas. Work Areas with natural lighting, and no night work to be performed, are exempt from this requirement. Temporary emergency exit lighting in the following Work Area(s) is optional if the Contractor provides flashlights to workers. NOTE: Flashlights must be in the possession of the Worker at all times while in the Work Area.

16. Shutdown of electric power during the wet removal or encapsulation phase of the Project is mandatory unless directed otherwise. Provide temporary power and lighting when necessary, and ensure safe installation of temporary power sources and equipment per applicable electrical code requirements including appropriate Ground Fault protection. Temporary light fixtures will be explosion proof. Provide and maintain auxiliary diesel generator equipment where existing facility power is insufficient. Locate generator or vent generator exhaust in a manner that will prevent carbon monoxide hazards to workers.
and the public. Contractor shall take all precautions necessary, including inspections and testing, to insure the safety of his employees and other building occupants from electrical hazards during the course of the Project.

17. The Contractor shall install and maintain Negative Air Pressure Equipment during the abatement and decontamination phases of the Project until the Clearance Test has passed. In unoccupied facilities a sufficient amount of air shall be exhausted by the unit(s) to create a pressure of -0.02 inches of water within the Work Area with respect to the area outside the Work Area. If only one unit is necessary to provide the specified negative air pressure in a Work Area, the Contractor shall have a backup unit in place should the first unit fail, and for filter changes. When more than one negative air pressure unit is required, emergency power back-up is required for only 50% of the units.] NOTE: As an alternative to the above Negative Air Pressure System, the Contractor may employ "the Differential Pressure Containment System" "as developed by Brand."

18. Notify the Observation Service twenty-four (24) hours in advance of when preparatory steps will be completed. Asbestos Abatement Work shall not commence until: all preparation requirements have been completed; all tools, equipment, and materials are on hand; all required submittals, notices and permits have been approved, and until the Observation Service authorizes in writing that Work may commence.

B. Preparation Procedures for: Nonfriable materials including, floor tile and mastic, baseboard mastic, carpet mastic, wallboard/joint compound, miscellaneous adhesives and the removal of pipe insulation by the Glovebag Method (when approved) and for minor or localized debris cleanup:

1. Above removal, repair and debris cleanup activities unless specified otherwise, shall be executed in an "Isolated" Work Area.

2. Contractor shall isolate the Work Area for the duration of the Project, completely sealing all openings, including but not limited to, HVAC ducts, diffusers and grilles, skylights, doorways and windows, with six (6) mil polyethylene sheet plastic securely taped to a clean surface. Spray adhesive applied on finished surfaces should be avoided where possible. As an option to isolating an entire room or area, the Contractor may construct a single-layer six (6) mil polyethylene Isolation barrier (Mini Containment) around the pipe, equipment or debris being worked on. Work Areas with permeable finishes and/or components will require the covering of such items with one layer of four (4) mil polyethylene plastic or the Contractor shall use the Mini Containment option.

3. Curtained Doorway: Contractor shall construct a Curtained Doorway of clear plastic sheeting, using six (6) mil polyethylene plastic, at entrances and exits to the Work Area. If the Mini Containment option is used, move the construction of the Curtained Doorway from the room entrance to the Mini Containment itself.

4. HVAC systems shall be shut down by Owner.

5. Shutdown of electric power during the wet removal or encapsulation phase of the Project is mandatory and shall be done by the Owner. Provide temporary power and lighting when necessary, and ensure safe installation of temporary power sources and equipment per applicable electrical code requirements including appropriate Ground Fault protection. Temporary light fixtures will be explosion proof. Provide and maintain auxiliary diesel generator equipment where existing facility power is insufficient. Locate generator or vent generator exhaust in a manner that will prevent carbon monoxide hazards to workers and the public. Contractor shall take all precautions necessary, including inspections and testing, to insure the safety of his employees and other building occupants from electrical hazards during the course of the Project.

6. The Contractor shall install and maintain Negative Air Pressure Equipment during the abatement and decontamination phases of the Project until the Clearance Test has passed. In unoccupied facilities a sufficient amount of air shall be exhausted by the unit(s) to create a pressure of -0.02 inches of water within the Work Area with respect to the area outside the Work Area. If only one unit is necessary to provide the specified negative air pressure in a Work Area, the Contractor shall have a backup unit in
place should the first unit fail, and for filter changes. When more than one negative air pressure unit is required, emergency power back-up is required for only 50% of the units.] NOTE: As an alternative to the above Negative Air Pressure System, the Contractor may employ "the Differential Pressure Containment System" "as developed by Brand."

7. Maintain existing emergency exits from the building. Maintain a minimum of two (2) exits from the Work Area where possible. The first exit shall be the Worker Decontamination Enclosure system. The second exit, when possible, shall be a second door, window, or other appropriate opening with a rip cord emergency only exit seal. Exits, where possible, shall be on opposite ends of the Work Area. All exits shall be labeled in bright letters or signage. The second exit shall be labeled "Emergency Exit Only." Establish alternative exits satisfactory to fire officials when existing building Work Area emergency exits are unavoidably blocked by activities of this project.

8. Provide and maintain appropriate "ABC" type fire extinguishers in the Work Area. The size and number of extinguishers shall be as required by local fire officials, but shall not be less than one (1) fire extinguisher inside and outside the Work Area.

9. Provide temporary emergency lighting with battery backup power in all Work Areas where none exists. Work Areas with natural lighting, and no night work to be performed, are exempt from this requirement. [Temporary emergency lighting in the following Work Area(s) is optional if the Contractor provides flashlights to workers. NOTE: Flashlights must be in the possession of the Worker at all times while in Work Areas.

10. Notify the Observation Service twenty-four (24) hours in advance of when preparatory steps will be completed. Asbestos Abatement Work shall not commence until: all preparation requirements have been completed; all tools, equipment, and materials are on hand; all required submittals, notices and permits have been approved, and until the Observation Service authorizes in writing that Work is to commence.

C. Preparation procedures for removal of nonfriable Asbestos-Containing roofing materials (in good condition.)

1. No Work Area preparation required.

4.2 ASBESTOS REMOVAL

A. Before removal, Asbestos materials shall be sprayed with Amended Water. The Asbestos materials shall be sufficiently saturated without causing excessive dripping and to prevent emission of airborne fibers, at any time, in excess of 0.05 fibers/cc. Spray materials repeatedly during the work process to maintain a wet condition.

B. Asbestos material shall be removed in manageable sections by a multi-person team, some of whom are wetting and the remainder removing and cleaning. Any material which falls to the ground shall be wetted and picked up immediately. Material shall not be allowed to dry out.. Before a second area can be started, removed material shall be packed into approved and labeled packaging while it is still wet.

C. Asbestos material applied to concrete, steel decks, beams, columns, pipes, tanks, and other nonporous surfaces shall be wet-cleaned to a degree that no traces of debris or residue are visible.

D. The Work Area shall be kept orderly, clean and clear of work materials, polyethylene sheeting, tape, cleaning material, and clothing, and all other disposable material or items used in the Work Area shall be packed into properly labeled protective packaging and removed from the Work Area.

E. Protective packages and drums containing Asbestos materials shall be cleaned and stored in the isolated Holding Area until that time when the materials are to be loaded and hauled to the Hazardous Waste Disposal Facility for burial. The packages and drums shall be stored in piles no higher than four (4) feet, and in a manner that will not result in damage to the packages or drums. Transport bags in covered drums or carts from the Holding Area to the transport.
F. Nonfriable materials:

1. Roofing Materials:
   a. Use removal methods that will keep the tearing and fraying of the roof membrane to a minimum. If sawing tools are used, they must be factory equipped with HEPA filtering devices, or perform in a manner that will not release visible dust emissions. Roofing debris made friable shall be misted with an asphalt resaturant before transportation to dumpsters. Do not use water. Do not use excessive amounts of resaturant that may result in leakage into the building. Apply additional resaturant, if necessary when the roofing debris is in the dumpster. Install, when possible, a protective tarp under the Work Area or dumpster where resaturant leakage may result in property damage.
   b. Off-load roofing debris into dumpster by means of chutes. Use dust control methods as required to hold dust generation to a minimum.
   c. Roofing shall be removed so that no felts are visible. Asphalt bitumen residue need not be removed from the substrate unless directed otherwise in the Contract Documents.
   d. Have adequate material on hand and available labor to protect exposed roof areas from water intrusion during inclement weather.
   e. The Work Area shall be kept orderly, clean and clear of work materials.
   f. Package roofing materials in double six (6) mil lined containers or bags, or in accordance with the disposal facilities requirements.

2. Floor Tile and Mastic: Remove floor tile and mastic with wet methods and in a manner that will not create friable debris. Mechanical equipment or tools used with water are permissible providing that friable debris will not be generated. Mechanical equipment or tools used without the use of water will be allowed only if they are the dustless type and if the equipment has a self-contained bagging system and HEPA filtration. [Remove tile and mastic until no residue is visible other than that which is embedded in the pores, cracks, or other voids below the surface of the floor substrate.] Package floor tile and mastic in unlabeled double six (6) mil lined containers or bags, or in accordance with the disposal facilities requirements. Mastic removed by bead blasting equipment shall be disposed of in labeled double six (6) mil polyethylene bags.

3. Transite Materials: Remove Transite materials with wet methods and in a manner that will not create friable debris. Do not use saws or other such mechanical equipment. Package "Transite" materials in unlabeled double six (6) mil lined containers or bags, or in accordance with the disposal facility's requirements.

A. Decontamination procedure for removal of nonfriable materials in non-prepared Work Areas:

1. The Contractor shall perform a complete visual inspection of the Work Area.
2. Asbestos debris encountered shall be removed.
3. Sealed drums and bags, and all equipment used in the Work Area shall be included in the cleanup, and shall be removed from the Work Area at the appropriate time in the cleaning sequence.
4. Upon completion of its visual inspection and any necessary cleaning, the Contractor shall notify the Observation Service that the Work Area is ready for Initial Review.
5. Upon proper notification, the Observation Service will review the Work Area for general conformance with the Specifications. Any nonconformance of the Work shall be remedied by the Contractor until the Work Area is in compliance, and at the Contractor's expense.
6. Upon successful compliance with the Initial Review, the Observation Service shall conduct Clearance Testing. Refer to appropriate Article in this Section on Air Monitoring for Clearance Testing standards.

4.3 ASBESTOS DISPOSAL

A. Asbestos-Containing Waste Materials shall be packed into approved sealed and labeled protective packaging.

B. Containers removed from the Holding Area must be removed by Workers who have entered from uncontaminated areas dressed in clean coveralls. Workers must not enter from uncontaminated areas into the Washroom or the Work Area; contaminated Workers must not exit the Work Area through the Equipment Decontamination Enclosure System.

C. Contractor shall deliver Asbestos-Containing Waste Materials to the pre-designated Hazardous Waste Disposal Facility in accordance with the guidelines of the EPA.

D. The Contractor shall notify the Owner’s representative twenty-four (24) hours, in advance, when Asbestos-Containing Waste Materials are to be removed from the site. The Observation Service must be present during the removal of Asbestos-Containing Waste Materials from the Work Area. A copy of the Uniform Hazardous Waste Manifest or other document required by State or Local agencies shall be submitted to the Observation Service for review and signature prior to transporting Asbestos-Containing Waste Materials to the disposal facility.

E. At the conclusion of Work, the Contractor shall provide evidence (such as a "Bill of Lading" or "Hazardous Waste Manifest") that the Asbestos-Containing Waste Material was disposed of at the approved EPA Hazardous Waste Disposal Facility. The evidence shall be submitted with the final request for payment, The Contractor shall indicate on the "Bill of Lading" or "Hazardous Waste Manifest" the weight, in tons, of the Asbestos-Containing Waste Material generated from the Project. This weight amount must be confirmed by a party independent from the Contractor.

F. The Contractor shall be responsible for the safe handling and transportation of all Hazardous Waste generated by the Project of this Contract to the designated Hazardous Waste Disposal Facility. The Contractor shall bear all costs for all claims, damages, losses, and clean up expenses against the Owner or the Observation Service, including but not limited to attorney's fees arising out of or resulting from Asbestos spills on the site or spills en route to the Hazardous Waste Disposal Facility.

G. Nonfriable Debris Disposal: Roofing, "Transite", resilient floor tiles, mastic and other Nonfriable Asbestos-Containing Materials will not be required to be disposed of as hazardous waste, unless they are made friable during demolition (see definitions for description of friability.) Friability will be determined by the Observation Service, Owner's Representative or a representative of a regulatory agency.

4.4 AIR MONITORING AND TESTING

A. Area Air Monitoring:

1. If required by the owner throughout removal, encapsulation, and cleaning operations, Area Air Monitoring may be conducted by the Observation Service to ensure that the Contractor's engineering controls and work practices are minimizing worker and public exposures to airborne asbestos fibers. in accordance with applicable codes, regulations, and ordinances. Fiber counting shall be done by the PCM Method No. 7400 established by NIOSH, with the following as minimum samplings recommended by the EPA:

<table>
<thead>
<tr>
<th>Areas To Be Sampled</th>
<th>Minimum No of Samples</th>
<th>Minimum Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benchmark</td>
<td>1/work area</td>
<td>2000L</td>
</tr>
<tr>
<td>Work Area</td>
<td>1/work shift</td>
<td>800L</td>
</tr>
<tr>
<td>Outside of Building</td>
<td>1/week</td>
<td>2000L</td>
</tr>
<tr>
<td>Adjacent to Work Area</td>
<td>1/work shift</td>
<td>2000L</td>
</tr>
</tbody>
</table>
2. The Observation Service shall report the Area Air Monitoring results to the Contractor on the following day. If Area Air Monitoring results are unsatisfactory, the Contractor shall make changes in his engineering controls and work practices to assure compliance with the following standards. Unsatisfactory results are fiber counts within the Work Area in excess of the Maximum Acceptable Level (0.05 fibers/cc) or fiber counts outside the Work Area in excess of the Benchmark.

B. Clearance Testing:

1. Contained, Isolated and Non-prepared Work Area: The Observation Service shall take a minimum of one (1) nonaggressive air sample of 2,000 liters, upon completion of each Work Area. The "Clearance" sample will be analyzed by PCM Method No. 7400 and determined "clean" before removal of containment or isolation barriers material from the Work Area.

2. If the tests show that the Work Area has not been decontaminated, the Contractor shall repeat the cleaning and/or encapsulation application until the Work Area is in compliance. For the purpose of this Project, decontamination for clearance testing by PCM Method No. 7400 shall be defined as air samples showing less than 0.01 fibers/cc. If the tests show that the Work Area has not been decontaminated, the Contractor shall repeat the cleaning and/or encapsulation application until the Work Area is in compliance.

4.5 REIMBURSEMENT OF COSTS OF THE OWNER OR THE OBSERVATION SERVICE

A. In the event that reviews and/or Clearance Testing by the Observation Service or regulatory agencies shows that the Work Area or any portion of the Work Area is not decontaminated or if the Work is not in conformance with the Contract Documents, the Owner, Observation Service and his Consultants will record all time, tests and project related expenses expended to monitor the Work until the work is in compliance. All time, and expenses recorded by the Owner, Observation Service and his Consultants to monitor the above work, and all time, tests and project related expenses incurred by the Owner and Observation Service and his Consultants outside the Project Work Days, Work Hours or Contract Time shall, at the discretion of the Owner, be paid for by the Contractor. The Contractor, promptly upon receipt of the billing from the Owner, or the Observation Service, shall reimburse the Owner at the normal billing rate of the Owner or the Observation Service and his Consultants, or the Owner is authorized to withhold funds from the Contract Sum, for all time spent by the Owner, Observation Service and his Consultants for reviews, testing, and other project related expenses when any of the above conditions occur.

4.6 STOPPING THE WORK

A. If, at any time, the Owner's representative decides that Work Practices are violating pertinent regulations, these Specifications or, in its opinion, endangering Workers or the public, it will immediately notify the Contractor (followed up in writing) that operations shall cease until corrective action is taken, and the Contractor shall take such corrective action before proceeding with the Work. Loss or Damages due to a Stop Work Order shall be borne by the Contractor.

4.7 CLEANUP

A. Contractor shall maintain a clean Project site during and upon completion of the Project.

END OF SECTION