

**SECTION 02 82 33****REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING MATERIALS****PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Hazardous Building Materials Survey Information is included at the end of this section for some of the sites.

**1.2 REFERENCE DOCUMENTS**

- A. The current issue of the following documents are incorporated herein and shall govern the conduct of the Work. Where conflict among requirements or with this specification exists, the more stringent requirements shall apply.
- B. Code of Federal Regulations (CFR):
  - 1. 29 CFR 1910, Occupational Safety and Health Standards, General.
  - 2. 29 CFR 1910.134 Respiratory Protection.
  - 3. 29 CFR 1910.1001 Asbestos – General Industry.
  - 4. 29 CFR 1910.1200, Hazard Communication.
  - 5. 29 CFR 1926 Occupational Safety and Health Standards, Construction.
  - 6. 29 CFR 1926.55, Gases, Vapors, Fumes, Dusts, and Mists.
  - 7. 29 CFR 1926.59, Hazard Communication.
  - 8. 29 CFR 1926.1101 Asbestos – Construction Industry.
  - 9. 40 CFR 61 Subpart A and Subpart M, USEPA, National Emission Standards for Hazardous Air Pollutants (NESHAP).
  - 10. 40 CFR, Part 763, The Asbestos Hazard Emergency Response Act.
  - 11. 49 CFR Parts 106, 107, 171 to 179, The Transportation Safety Act, Hazardous Material Transportation Act.
- C. California Code of Regulations (CCR):
  - 1. Title 8, Section 1514, Personal Protective Equipment
  - 2. Title 8, Section 1529 Asbestos in the Construction Industry.
  - 3. Title 8, Section 1531 Construction Respiratory Protective Equipment.
  - 4. Title 8, Section 3203 Injury and Illness Prevention Program.
  - 5. Title 8, Section 5144 Respiratory Protective Equipment.
  - 6. Title 8, Section 5155 Airborne Contaminants.
  - 7. Title 8, Section 5194 Hazard Communication.
  - 8. Title 8, Section 5208 General Industry Safety Orders, Asbestos Regulations.
- D. State and Local Regulations: Those regulations promulgated under the Clean Air Act

or Occupational Safety and Health Act and incorporated in a State plan recognized by EPA or OSHA, respectively.

1. San Diego Air Pollution Control District Subpart M, National Emission Standards for Asbestos, Rule 361.145 Standard for Demolition or Renovation.

E. American National Standards Institute (ANSI):

1. ANSI Standard Z9.2 Fundamentals Governing the Design and Operation of Local Exhaust Ventilation Systems.

F. American Society for Testing and Materials (ASTM):

1. ASTM Standard D1331 Standard Test Methods for Surface and Interfacial Tension of Solutions of Surface Active Agents.
2. ASTM Standard E1368 Standard Practice for Visual Inspection of Asbestos Abatement Projects.
3. ASTM Standard E1494 Standard Practice for Encapsulation Testing of Friable Asbestos-Containing Surfacing Materials.

### 1.3 SUMMARY

- A. Section includes the furnishing of all labor, materials, facilities, equipment, services, employee training, permits, agreements, waste transport and disposal necessary to perform the work required for asbestos removal in accordance with these specifications, EPA, APCD, OSHA, NIOSH, State of California regulations, and any other applicable federal, state and local government regulations. Whenever there is a conflict or overlap of the above references, the most stringent provisions are applicable.
- B. Perform the work and provide service as needed to accomplish abatement of asbestos containing materials at the Project Site. Specific locations and materials to be removed/disturbed are indicated on the Drawings. Sampling data for identification of asbestos containing materials and non-asbestos containing materials is available from the Construction Manager. The requirements of all regulations and specifications must be observed for the removal or disturbance of any material containing any amount of "asbestos."
- C. Comply with all requirements of this specification. Alternate and innovative technologies and procedures are encouraged and must be submitted in detail for approval prior to any work being performed. Any alternative technologies submitted must have been written by a Certified Industrial Hygienist (CIH) or State of California Certified Asbestos Consultant (CAC).
- D. In the event ACMs or ACCMs in addition to those indicated in the Drawings are discovered, do not disturb. Immediately notify the Construction Manager who will have the additional materials tested.
- E. Related Requirements:

1. Section 02 83 33 "Removal and Disposal of Materials Containing Lead" for lead abatement.
2. Section 02 84 33 "Removal and Disposal of Universal Waste Rule and PCB" Universal Waste and PCB abatement.

**1.4 ALLOWANCES**

- A. Allowances for removal and disposal of ACM and ACCM in addition to those indicated on the Drawings are specified in Section 01 21 00 "Allowances."

**1.5 DEFINITIONS**

- A. All terms not defined herein shall have the meaning given in the applicable publications and regulations.
- B. "Abatement Activities" shall mean all activities from the initiation of work area preparation through successful clearance air monitoring performed at the conclusion of an asbestos project.
- C. "Air Lock" shall mean an enclosed space designed to control air movement between two areas. It is composed of sealed spaces with curtained doorways at its portals. A Worker Decontamination Facility contains at least three air locks.
- D. "Ambient Air Monitoring" shall mean measurement or determination of airborne asbestos fiber concentrations outside but in the general vicinity of the work site.
- E. "Amended Water" or "Wetting Agent" shall mean water to which an approved surfactant has been added in proportion of at least one (1) ounce surfactant to five (5) gallons water.
- F. "Asbestos-Containing Materials (ACM)" shall mean any insulation, fireproofing, plaster, ceiling or floor tiles and any other building materials containing more than 1% asbestos (>1%).
- G. "Asbestos-Containing Construction Material (ACCM)" shall mean any material containing between one-tenth of one percent and one percent asbestos (0.1% - 1%).
- H. "Asbestos-Contaminated Objects" shall mean any objects, which may be contaminated by asbestos or asbestos-containing material as determined by the Consultant.
- I. "Asbestos Disposal" shall mean the removal of containerized asbestos, asbestos-containing material, asbestos-containing waste material and asbestos-contaminated objects from the regulated area to the final EPA approved disposal site.
- J. "Authorized Visitors" shall mean any visitor authorized by the Consultant or any representative of a regulatory agency or other agency having jurisdiction over the project.
- K. "Barriers or Containment Barriers" shall mean walls, tunnels, or enclosures erected to

separate any section of an abatement area from adjoining spaces. Where indicated on drawings, barriers shall be constructed of 2'x 4's, with minimum 1/2" plywood walls, and all seams in plywood and edges shall be sealed airtight with caulking. The inside (work) side of all such barriers shall be covered with two (2) layers of 6-mil polyethylene sheeting. Tunnels to maintain public access through a work area shall also be defined as part of the barriers. All lumber, plywood, and polyethylene shall be flame retardant and shall bear manufacturer's label.

- L. "Baseline or Background Air Monitoring" shall mean a measurement or determination of airborne asbestos fiber concentrations inside the workplace and outside a building prior to starting abatement activities.
- M. "Certified Clean" shall mean that a work area has no visible signs of fibrous materials or other contamination and does not have levels of airborne fiber above the defined air clearance criteria.
- N. "Class I asbestos work" means activities involving the removal of thermal systems insulation (TSI) and surfacing ACM and PACM.
- O. "Class II asbestos work" means activities involving the removal of ACM which is not thermal system insulation or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastics.
- P. "Class III asbestos work" means repair and maintenance operations, where "ACM", including TSI and surfacing ACM and PACM, is likely to be disturbed.
- Q. "Class IV asbestos work" means maintenance and custodial activities during which employees contact but do not disturb ACM or PACM and activities to clean up dust, waste and debris resulting from Class I, II, and III activities.
- R. "Clean or Decontaminate" shall mean to make a surface free of all visible and optically detectable fibers by thoroughly HEPA-vacuuming and wet washing with sponges and mops.
- S. "Clean room" shall mean an uncontaminated room having facilities for the storage of employees' street clothing and uncontaminated materials and equipment.
- T. "Competent Person" shall mean one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them, In addition, for Class I and Class II work, one who is specially trained in a training course that meets the criteria of EPA's Model Accreditation Plan (40 CFR part 763) for supervisor, or its equivalent.
- U. "Consultant" shall mean the consulting industrial hygienist. The Consultant is an independent party retained by the District to provide consultation services for asbestos abatement activities.
- V. "Curtained Doorway or Entrance" shall mean a portal which limits air movement between two areas, constructed by placing two overlapping sheets of plastic over an

existing or temporary doorway, by securing each along the top of the doorway, by securing the vertical edge of one sheet along one vertical side of the doorway, and by securing the vertical edge of the other sheet along the opposite vertical side of the doorway.

- W. "Decontamination Facility (DF) or Area (DA)" shall mean a series of connected rooms or spaces including clean room, shower room, and contaminated dirty (equipment) room, each separated by an air lock; and used for the decontamination of all workers, and their personal protective equipment leaving an asbestos removal work area, as well as for access to such work areas. All decontamination facilities shall be a "structural" (i.e. capable of supporting workers standing above).
- X. "Disposal Site" shall be an EPA approved landfill.
- Y. "District" shall mean the San Diego Unified School District.
- Z. "Disturb" shall mean contact that releases fibers from ACM, PACM, or ACCM. It includes any activity that disrupts the matrix of ACM, ACCM, or PACM, crumbles or pulverizes ACM, ACCM, or PACM, or generate visible debris from ACM, ACCM or PACM. Any activity which alters, changes, or stirs ACM or PACM, such as but not limited to the removal, encapsulation, enclosure or repair of ACM or asbestos contaminated material.
- AA. "Encapsulation" shall mean procedures necessary to coat or saturate material with an approved encapsulant liquid to control the possible release of fibers into the ambient air. "Encapsulant" (sealant) shall mean liquid material which can be applied to other solid material which reduces the possible release of 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).
- BB. "Equipment room" means a contaminated room located within the decontamination area that is supplied with impermeable bags or containers for the disposal of contaminated protective clothing and equipment.
- CC. "Fiber" shall mean a particulate form of asbestos, 5 micrometers or longer, with a length-to-diameter ratio of at least 3 to 1.
- DD. "Final Cleaning" shall mean that no three-dimensional material is visible to the naked eye.
- EE. "Fixed Items" shall mean equipment, furniture, radiators, or other objects, which cannot be removed from the work area, plus walls and floors.
- FF. "HEPA-Filtered Exhaust Units or Fans" shall mean a fan equipped with a High Efficiency Particulate Air:(HEPA)filter greater than 99.97 percent efficient by 0.3 micron DOP test, and complying with ANSI Z9.2, Local Exhaust Ventilation. It shall be used to create a pressure in a work area (reduced with respect to surrounding areas) in order to prevent the escape of asbestos fibers. It shall also be used to reduce and control the airborne concentration of asbestos fibers.
- GG. "HEPA-Filtered Vacuum" shall be a vacuum cleaner specifically designed for and

equipped with HEPA-filtration.

- HH. "Install" shall mean set in place completely ready for normal use or service, including all necessary mounting facilities, connections and testing.
- II. "Isolation Barriers" shall mean the construction of partitions, the placement of solid materials, and the plasticizing of apertures to seal off the workplace from surrounding areas and to contain asbestos fibers in the work area.
- JJ. "Lockout" shall mean the safe, approved means for shutting down HVAC equipment, electrical panels or breakers and water so that they cannot be inadvertently turned back on.
- KK. "Log" shall mean an official record of all activities that occurred during the project and it shall identify the District, Contractor, workers, floor number, date, work area, and other relevant information to the project.
- LL. "Major Abatement" shall mean the removal of ACM under contained conditions utilizing full isolation and negative pressure ventilation systems.
- MM. "Minor Abatement" shall mean the removal of ACM utilizing "glovebag" methods or modified containment.
- NN. "Outside Air" shall mean the air outside the buildings and structures.
- OO. "Outside/Ambient Air Samples" shall mean samples collected outside of the containment area in the building and analyzed using the NIOSH 7400 Method.
- PP. Presumed Asbestos-Containing Material (PACM) means thermal systems insulation or surfacing material found in buildings constructed no later than 1980, unless rebutted according to 8 CCR 1529 (k)(4).
- QQ. "Project" or "Project Site" shall refer to the eight sites included in this RFP.
- RR. "Protect Fixed Items" shall mean to cover with solid enclosures and 6-mil polyethylene sheeting, and secure by taping or gluing water and airtight.
- SS. "Provide" shall mean furnish (or supply) and install.
- TT. "Regulated Area" shall have the meaning set forth in 8 CCR 1529, which is an area established by the employer to demarcate areas where Class I, II, and III asbestos work is conducted, and any adjoining area where debris and waste from such asbestos work accumulate; and a work area within which airborne concentrations of asbestos, exceed or there is a reasonable possibility they may exceed the permissible exposure limit.
- UU. "Remove Asbestos" shall mean to make a surface free of all visible fibrous materials or microscopically detectable asbestos fibers.
- VV. "Renovation" shall mean an addition or alteration or a change or modification of building or the service equipment therefore which is not classified and an ordinary

repair.

WW. "Repair" shall mean corrective action using specified work practices (e.g. glove bag, plastic tent procedures, etc) to minimize the likelihood of fiber release from minimally damaged area of ACM.

XX. "Replacement Material" shall mean any material approved by the District used to replace ACM.

YY. "Seal" or "Block and Seal" shall mean preparing a space or area such that there is no air movement or passage to and from the area. "Isolation barrier" shall mean the system of seals or other items, which prevent air movement to and from any work area.

ZZ. "Shift" shall mean a worker's or simultaneous group of workers' complete daily term of work.

AAA. "Surface Barriers Protective Coverings or Poly" shall mean the plasticizing of walls, floors, and fixed objects within the work area to prevent contamination during subsequent abatement activities.

BBB. "Surfactant" shall mean a chemical wetting agent added to water to improve penetration into asbestos-containing materials and thereby reduce the generation of airborne asbestos fibers.

CCC. "Work Area" shall mean an area where asbestos removal or other abatement procedures are being performed. A work area is considered a contaminated space between the times preparation begins and the time the area is certified clean by the Consultant.

DDD. "Work Place" shall mean the work area and the project site.

**1.6 PRE-ABATEMENT MEETINGS**

A. Pre-Abatement Conference: Conduct conference at Project Site.

1. The District will arrange a Pre-Abatement Conference, attended by a representative of the District, the Consultant, and the Contractor.
2. The Contractor shall identify his Supervisor and Foreman at this conference.
3. Provide electronic copies of "Action Submittals" at least five working days prior to this conference.
4. Pre-Abatement Conference topics may include, but are not limited to, the following:
  - a. Contractor listing of existing site condition (e.g. damage).
  - b. Contractor and supporting vendor site access and parking.
  - c. Coordination of Contractor access routes to the work area, including approved doors, stairways, corridors, and elevators.
  - d. Availability of building utility services, such as power, water, and drains.
  - e. Determination of equipment and other movable items to be removed from the work area(s) by the Contractor, and the location of temporary storage

- space.
- f. Location, coverage, and use of isolation barriers and decontamination facilities.
- g. Emergency Response Procedures.

### 1.7 ACTION SUBMITTALS

- A. Asbestos Abatement Plan prepared and signed by a Competent Person. The Plan shall include minimally the following:
  - 1. The proposed removal methods including a detailed listing of all materials, tools, equipment, and expendable supplies that will be used during the project. For each listed item provide (as appropriate) the manufacturer's name, catalog number or model, a description of its function and location of use, an actual sample or photocopy of manufacturer's brochure. The listing shall include at a minimum spray encapsulants, wetting agents, spray adhesives (including Material Safety Data Sheets (MSDS), and equipment including HEPA-vacuums, HEPA-filtered exhaust fans, respirators, protective clothing, waste containers, protective fireproof plastic coverings, sealing tapes, materials and compounds, temporary power and electric equipment, shower water pumps and filters, encapsulating equipment, and materials for constructing decontamination facilities and barriers.
  - 2. A sketch or written description detailing the regulated work area, decontamination set-up, waste-load out, location and number of negative machines.
  - 3. A description of the exhaust system including proposed number, capacity, and location of HEPA exhaust units, and the method of discharge to the building exterior.
  - 4. A work sequencing plan that includes the number of shifts, shift times, and number of workers per shift for each phase of remediation work. Include name, summary of experience, and certifications for asbestos work of all personnel, including supervisors who may be used during the contract period (minimum of one qualified supervisor is required).
  - 5. A waste disposal plan including the labeling of waste containers, proposed waste hauler, and proposed landfill(s) for friable and non-friable asbestos waste.
  - 6. A security plan including the locations of warning signs, prevention of unauthorized entry into the area, log book forms for recording entries into the work areas, accident prevention, equipment, and methods to communicate between personnel inside and outside the work areas.
  - 7. An emergency/contingency plan including emergency ingress/egress from the work areas, accident notification policy, emergency fire and accident response procedures (including emergency decontamination procedures).

### 1.8 INFORMATIONAL SUBMITTALS

- A. Pre-Abatement Submittals:
  - 1. Copies of notifications to government entities, including San Diego Air Pollution Control District and California-OSHA (Division of Occupational Safety and



Health). Notifications by Contractor are limited to only those parties Contractor is required to notify by law and this specification. Notification to the Project Inspector and Consultant are also required at least 5 days prior to commencement of each phase or mobilization of asbestos work.

2. Signed documentation of training and education of all proposed workers, including respirator fit tests and copies of OSHA specified medical exams with respirator approvals.
3. List of all Sub-Contractors proposed for this project, with their specialty and qualifications along with submittals meeting the same requirements.
4. Proposed waste hauler and copies of applicable licenses, including solid waste transportation registration issued by the California Department of Health Services Toxic Substance Division.
5. Proposed landfill for disposal of waste materials and letter from landfill authorizing hauler to dispose there.
6. A copy of the Contractor's State of California, Department of Industrial Relations, Division of Occupational Safety and Health, Certificate of Registration for Asbestos-Related Work.

B. Submittals During Abatement Work:

1. Regulated area entry logs showing names of person entering the workspace, date and time of entry and exit.
2. Safety log, including record of any accident, emergency evacuation, and any other safety and health incident.
3. Monitoring results as conducted by the Contractor's Representative shall be submitted on a daily basis to the Consultant.
4. Recording/Printouts of negative pressure manometer readings inside containment shall be submitted on a daily basis to the Consultant.

### 1.9 CLOSEOUT SUBMITTALS

A. Submit immediately upon completion of abatement work:

1. Copies of manifests and receipts acknowledging disposal of all hazardous and non-hazardous waste material from the project showing delivery date, quantity, and appropriate signature of landfill's authorized representative.
2. A copy of the entry-exit logbook.
3. All personal monitoring results.

### 1.10 PERFORMANCE REQUIREMENTS

A. Authority to Stop Work:

1. The District retains the authority to stop abatement work at any time the District and Consultant determines that conditions are not within the specifications and applicable regulations. The stoppage of work shall continue until conditions have been corrected and corrective steps have been taken to the satisfaction of the Consultant and/or District.
2. Stop Work Orders may be issued for, but not limited to, the following:

- a. Poor work practices related to fiber control, including but not limited to failure to adequately wet and failure to keep regulated area clean and free from debris.
- b. Excessive airborne fibers inside or outside the work area.
- c. Breaks in barriers.
- d. Loss of negative air pressure (i.e. a manometer reading of less than 0.02 inches of water) for any OSHA Class I Work.
- e. Any other situation (outside the work area) where the District and/or Consultant establishes that the airborne clearance criterion is reached (i.e. fiber concentration at or greater than 0.01 fibers/cc outside containment). When the clearance criterion of 0.01 fibers/cc is reached for non-work areas, stop work and initiate cleanup procedures to reduce airborne fiber levels to below 0.01 f/cc for non-work areas.

B. Project Supervision:

1. Provide English-speaking on-site Supervisor and at least one Foreman for each work area at all times while abatement work is in progress. The Supervisor and Foreman shall be Competent Persons, as defined by 8 CCR 1529, and must be experienced in asbestos abatement work, knowledgeable of all EPA, OSHA, and local regulations, and capable of skillfully executing all work promptly, efficiently, and in compliance with all requirements of this Specification.
2. Upon request of the District and/or Consultant, submit proof of qualifications and project experience for the Supervisor and Foreman.
3. The District reserves the right to have any supervisory personnel removed if they do not demonstrate the requisite experience or skills to safely direct the work, and adequately protect their own employees or District.
4. Instruct, train, and provide required protective devices for all workers of other trades who must enter any work area before it is certified clean. The instruction shall include, at a minimum, proper use and fitting of respiratory protective devices and protective clothing, entry and exit procedures for all work areas, hazards, or asbestos exposure, work procedures, and other safety requirements contained in this Specification.
  - a. Proof of such instructions for other trades shall be supplied prior to being allowed to enter the work area.
  - b. The instruction does not relieve the other trades from the regulatory requirements for medical surveillance and other requirements of 8 CCR 5144 for the use of respiratory protective devices. Copies of the medical surveillance examinations shall also be provided prior to being allowed to enter the work area.

C. Availability of Trained Personnel:

1. Since other construction-related activities cannot commence until the successful decontamination of the work area, it is imperative that a sufficient number of trained personnel be provided for the duration of abatement activities to complete the work within the required schedule.
2. Do not staff the project with untrained, unqualified, or any unapproved personnel to speed up the completion of the abatement work.

## D. Protection of Persons and Property:

## 1. General Safety Requirements:

- a. Initiate, maintain, and supervise all safety precautions and programs in connection with the Work. Take all reasonable precautions for the safety of, and provide reasonable protection to prevent damage, injury, or loss to:
    - 1) All employees on the Work and other persons who may be affected thereby.
    - 2) All Work and all materials and equipment to be incorporated therein.
    - 3) Other property at the Project Site and adjacent thereto.
  - b. Give all notices and comply with all applicable laws, ordinances, rules, regulations, and orders of any public authority bearing on the safety of persons and property and their protection from damage, injury, and loss.
  - c. Remedy all damage or loss of any property caused in whole or in part by the Contractor, any Sub-Contractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable, and not attributable to the fault or negligence of the Contractor. The Contractor shall be responsible for the protection of any finished work from damage or defacement by his/her operation.
2. Assess and control the real or potential impacts of the Work upon the District's Life Safety Systems (e.g. smoke detectors, sprinkler systems, etc.). Establish coordination prior to any commencement of work, subject to modification by the District at any time, based on the District's assessment of risks to the function of the life safety systems associated with the Contractor's actions.
  3. Establish an effective safety program in accordance with the requirements set forth in 8 CCR Subchapter 4, Construction Safety Orders and 29 CFR 1926 Safety and Health Regulations for Construction, Subpart A through Z.

## E. Respiratory Protection:

1. Provide all workers, foremen, superintendents, authorized visitors, and inspectors personally issued and marked respiratory protective equipment approved by NIOSH. When respirators with disposable filters are employed provide sufficient filters for replacement as necessary by the worker or authorized visitor. Filters shall be disposed of as contaminated waste.
2. Instruct and train each worker involved in asbestos abatement (Class I, II, III) or maintenance and repair of friable asbestos-containing materials in proper respiratory use and require that each worker always wear a respirator properly fitted on the face in the work area from the start of any operation that may cause airborne asbestos fibers until the work area is completely decontaminated and cleared for re-occupancy. Use respiratory protection appropriate for the fiber level encountered in the work place or as required for other toxic or oxygen-deficient situations encountered.
3. A respirator providing a minimum protection factor of 10 and equipped with a HEPA/P100 filter shall be used as long as 0.5 f/cc is not exceeded within the work area. If exceeded, all work inside the work area shall stop, and corrective actions-(cleaning) will be required until fiber levels are reduced to less than 0.5

- f/cc. Filtering facepiece device respirators are not permitted.
4. Unless otherwise permitted, respiratory protection as specified herein shall be worn at all times, including preparation of the work areas, loading and unloading of waste containers in the work area or at the transport truck, and cleaning of work area.
  5. Facial hair such as beards, long sideburns, and moustaches that interfere with the seal of air purifying type respirators are prohibited. Workers with eye corrective lenses (contact lenses or glasses) shall wear the corrective lenses in a manner that is in compliance with 8 CCR 1529 and 8 CCR 5144.
  6. Respiratory protection use, inspection, maintenance, decontamination, and storage procedures shall meet the requirements of 8 CCR 5144. In addition:
    - a. Respiratory protection shall be the last piece of worker protection equipment to be removed. Workers must wear respirators in the shower when going through decontamination procedures as stated herein.
    - b. Airline respirators with HEPA-filtered disconnect shall be disconnected in the equipment room and worn into the shower. Powered air-purifying respirator face pieces shall be worn into the shower. Filter/power pack assemblies shall be decontaminated in accordance with manufacturers' recommendations.
    - c. Whenever respirator design permits, workers shall perform a positive and negative air pressure fit test each time a respirator is worn. Powered air-purifying respirators shall be tested for adequate flow (using the methods specified by the manufacturer) every four (4) hours of use and each time the worker enters or exits the work area. Maintain written logs of these tests.
    - d. Furnish to the Consultant written documentation that each worker is medically approved to wear respirators and has been properly trained in their use, inspection, care, maintenance, and fit testing pursuant to the Contractor's written Respirator Plan.
  7. Except to the extent that more stringent requirements are written directly into the Contract Documents, the following regulations and standards have the same force and effect (and are made a part of the Contract Documents by reference) as if copied directly into the Contract Documents, or as if published copies were bound herewith. Where there is a conflict in requirements set forth in these regulations and standards, the more stringent requirements must be met.
    - a. OSHA U.S. Department of Labor Occupational Safety and Health Administration, Safety and Health Standards 29 CFR 1910, Section 1001 and Section 1910.134, 29 CFR 1926.
    - b. NIOSH National Institute for Occupational Safety and Health.
    - c. California Code of Regulations 8 CCR 5144.
- F. Personal Protective Equipment:
1. Provide to all workers, foremen, superintendents and authorized visitors and inspectors that may enter the asbestos regulated work area protective disposable clothing consisting of full-body coveralls, head covers, gloves, 18-inch high boot-type covers or reusable footwear, and eye protection.
  2. Provide hard hats and safety shoes as required by job conditions and safety

regulations.

3. Reusable footwear, hardhats, and eye protection devices shall be left in the "Contaminated Equipment Room" until the end of the asbestos abatement work, at which time they shall be disposed of as ACM waste or transferred to another work area by methods approved by the Consultant.
4. All disposable protective clothing shall be discarded and disposed of as asbestos waste every time the wearer exits from the workspace to the outside through the decontamination facilities.

G. Decontamination Facilities:

1. Worker decontamination enclosure systems shall be provided at all locations where workers will enter or exit the work area. At a minimum, one system at a single location is required.
2. Worker decontamination enclosure systems constructed at the project site shall utilize 6-mil black or opaque polyethylene sheeting or other approved materials for privacy.
3. The personal decontamination unit shall not be located inside the work area without written authorization from the District and/or Consultant.
4. Alternate methods of providing Decontamination facilities may be submitted to the District and/or Consultant for approval. Implementation of these alternative methods may not proceed without written approval by the District and/or Consultant.
5. For OSHA Class I (Friable) work, the worker decontamination enclosure system shall consist of at least a clean room, a shower room, and an equipment room, each separated from the other and from the work area by airlocks.
6. For OSHA Class II (Non-friable) work or a work area for the removal of an ACCM, the worker decontamination enclosure system shall consist of at least a clean room and an equipment room, each separated from each other and the work area by airlocks.
7. The clean room shall be sized for the work crew. Space for storing respirators shall be provided in this area. Clean work clothes, clean disposable clothing, replacement filters for respirators, towels and other necessary items shall be provided in adequate supply in the clean room. A location for posting notices shall also be provided in this area.
8. The shower room shall contain one or more showers to adequately accommodate workers. Each showerhead shall be supplied with warm and cold water, and be protected against leakage of any kind. An adequate supply of soap, shampoo and towels shall be supplied by the Contractor and be available at all times. Shower water shall be drained, collected, and filtered through a system with at least a 0.5 to 1.0 micron particle size collection capacity.
9. The equipment room shall be used for the storage of equipment and tools at the end of a shift after the tools have been decontaminated using HEPA-filtered vacuum and/or wet cleaning techniques, as appropriate. Replacement filters, stored in sealed containers until used, for filtration equipment, extra tools, containers, surfactants and other materials and equipment that may be required during abatement activities may also be stored in the equipment room. A walk-off pan (e.g. a small children's swimming pool or equivalent), filled with water, shall be located in the room for workers to clean off foot coverings after leaving the work area and prevent excessive contamination of the worker decontamination enclosure system. A drum lined with a labeled 6-mil polyethylene bag for

collection for disposable clothing shall be located in the equipment room. Contaminated footwear shall be stored in this area for reuse the following workday.

H. Worker Protection Procedures:

1. Provide all personnel throughout the abatement process with the specified protective clothing and respiratory protection. Ensure that all personnel entering and leaving the workspace follow the following procedures:
  - a. Entering from the outside: Change from street clothes into the protective clothing and wear clean protective gear, go through Shower Room into Dirty Equipment Room, pick up equipment and tools, and enter the Work Area.
  - b. Exiting from the Work Area: Dispose of all protective clothing into plastic bags labeled for asbestos waste. Do not take off the respirator, but still wearing the respirator, enter the shower, and shower thoroughly. Remove respirator and wash and wipe thoroughly to decontaminate the respirator. After drying, enter the Clean Room, store the decontaminated respirator in the assigned space, and dress into street clothes.
2. Post written procedures in workplace and train all personnel on the procedures for the evacuation of the injured and the handling of potential fires. Provide air to a seriously injured worker without delay for decontamination. Make provisions to minimize exposure of rescue workers and to minimize spreading of contamination during evacuations and fire procedures.
3. Instruct all employees and workers in the proper care of their personally issued respiratory equipment, including daily maintenance, sanitizing procedures, etc.
4. Contractor's project supervisory personnel shall inspect all respiratory equipment at the beginning of each work period, including breaks and lunch periods. Written records of these inspections shall be maintained and provided to the Consultant.

I. Exposure Controls and HEPA-Filtered Exhaust Ventilation:

1. Install inside the work area one or more portable HEPA-filtered exhaust units to maintain the area, including the Decontamination Facilities, under negative air pressure, and to reduce or control airborne asbestos fiber concentrations. Provide a contingency plan for maintaining negative air requirements in the event of mechanical failure.
2. To determine the number of required units, compute the total cubic footage of all workspaces within the work and determine the air moving capacity of all the HEPA-filtered units to be used in each workspace. This measurement shall be made in cubic ft/min. under a filter load equivalent to two inches of static pressure.
  - a. The exhaust(s) must be capable of providing: 1) at least four (4) full air changes per hour in the work area and for "Class I Work"; 2) an inward velocity through any openings, including the decontamination facilities, of at least 200 fpm; and 3) a static negative air pressure inside the area of a minimum of 0.02 inches water column. Each exhaust system shall have a dedicated power system and shall be operated continuously (24

hours/day) in accordance with "Specifications and Operating Procedures for the Use of Negative Pressure Systems for Asbestos Abatement," Guidance for Controlling Asbestos-Containing Materials in Building, EPA report Number 560/5-85-024 (1985).

- b. Each exhaust unit shall be equipped with the following:
  - 1) Magnehelic gauge to monitor the unit's air pressure difference across the filters and to interpret the magnehelic reading to CFM.
  - 2) Automatic shut off for filter failure or filters absence.
  - 3) Audible alarm with flashing red light for unit shutdown.
  - 4) Amber Flashing warning light for excessive filters loading.
  - 5) A safety system that prevents unit from being operated with the HEPA filter in backwards.
- c. All-exhaust air shall pass-through HEPA filters before being discharged to the exterior of a building. The exterior exhaust discharge point shall be at least 10 feet from a receptor such as an air intake port, or louvers.
- d. Before starting any work, submit in writing the proposed number, capacity, and location of exhausts, and the method of discharge to the building exterior. Work shall not be permitted until the Consultant approves the proposed exhaust system.
- e. Exhaust systems shall be operated twenty four (24) hours per day at all times during preparation, removal, encapsulation, and cleanup tasks as specified herein; and until final "clean air" certification is obtained for the area, and Consultant directs Contractor to shut the system down.
- f. On loss of negative air pressure or electric power, all work activities in the area shall stop immediately and shall not resume until power is restored and the HEPA-exhaust systems are operating again. When power failure or loss of negative pressure lasts, or is expected to last, longer than one hour, the following shall occur:
  - 1) The make-up air inlets in the decontamination facilities and any other make-up air inlets shall be sealed airtight;
  - 2) The decontamination facilities shall be sealed airtight after the evacuation of all personnel from the work area;
  - 3) All adjacent areas shall be monitored for asbestos fiber concentration upon discovery of, and subsequently throughout the power failure.
- g. Provide and continuously operate for all "Class I Work" an automatic air pressure differential recording instrument that produces a permanent record. Recorder shall have a range of -0.09" H2O to +0.09" H2O. Copies of the recorded reading shall be maintained and provided daily to the Consultant.
- h. This system must conform to the previously described requirements and 29 CFR 1926.58 Appendix F "Exhaust Air Filtration System."

J. Air Monitoring:

- 1. Consultant Air Monitoring:
  - a. Provide full cooperation and support to the Consultant throughout the

**REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING MATERIALS**

course of the monitoring work. The Consultant will closely and continuously monitor the performance and execution of the work. The monitoring work will be performed inside both the work area and the surrounding area to ensure full compliance with these specifications and all applicable regulations. Ambient air samples will be collected and analyzed by the Consultant. Consultant monitoring and inspections will include air samples in the workspace, air samples in the areas surrounding the work areas and the outside, checking of the Contractor's standard operating procedures, engineering controls, respiratory protection equipment, packing, packaging, transporting and disposal of asbestos, decontamination facilities and procedures, and any other aspects of the abatement process that may impact the health and safety of the people and the pollution of the environment.

- b. The District will bear all costs in connection with the laboratory work required in Paragraph above. However, the costs of all subsequent laboratory analysis taken because the limits specified were exceeded on the initial tests shall be borne by the Contractor. The Contractor shall also conduct and bear the cost of personal air samples for OSHA compliance.
- c. The Contractor will receive copies of all laboratory reports presenting the results of the Consultant's air monitoring and inspection.

2. Contractor Air Monitoring:

- a. The Contractor shall be responsible for personal air monitoring to document compliance of his workers with OSHA regulations using the methods as reiterated below.
- b. The sampling person and analysis laboratory performing this work shall be an independent party not financially or managerially connected to the contractor.
- c. The laboratory shall be successfully participating in the American Industrial Hygiene Association (AIHA) NIOSH Proficiency Analytical Testing (PAT) program.
- d. Air sampling materials and equipment requirements are as follows:
  - 1) Personal sampling shall be performed pursuant to NIOSH Method 7400, phase contrast microscopy.
  - 2) The filter assembly shall be upstream of all other components in the sampling train. An airflow-measuring device (when used) shall be downstream of the filter and the pump assembly, or integral with the pump assembly.
  - 3) Sampling pumps shall supply constant flow.
  - 4) An airflow measuring/metering device shall be used, and shall be high quality rotameter, mass flow, dry gas meter, or critical orifice. Measuring devices shall have a range of at least 1.5 times the desired flow rate and be readable to at least +or -5 % of the desired flow rate. They shall be calibrated against standards of higher accuracy before and after sampling. The calibrations shall be recorded.
  - 5) Numbers and frequencies of personal air sampling shall be as required by OSHA regulations but not less than (1) sample per eight (8) hour work shift during times of asbestos removal work.



- 6) Results of sample analysis shall be provided to the Consultant within twenty four (24) hours of collection.
- 7) All other air sampling for compliance with the Specifications shall be performed by the Consultant at no cost to the Contractor except where the Contractor fails specified tests.
- 8) Use a pre-approved "chain of custody" form for all personal air samples collected.

**1.11 QUALITY ASSURANCE****A. Notifications, Permits, Warning signs, Labels, and Posters:**

1. Provide the required written pre-notification to EPA, SDAPCD, CAL/OSHA, and any other regional, state, and local authority having jurisdiction over the project. Copies of the pre-notifications shall be delivered to the Consultant before any work begins. The Contractor must secure all other permits required for the work, including disposal of asbestos in an approved landfill.
2. Provide the necessary follow-up notices that may be required, obtain all permits, and pay all governmental taxes, fees and other costs in connection with his work. File all necessary drawings, prepare all documents, and obtain all necessary approvals of all governmental departments having jurisdiction.
3. Include in the work, without extra compensation, all labor, materials, services apparatus, to comply with all applicable laws, ordinances, rules, and regulations.
4. All materials and work shall comply with the specifications of the National Fire Protection Association (NFPA), National Electrical Code (NEC/NFPA 70), Underwriters Laboratories (UL), local utility companies, and the County Department of Health, with the California Building Code, and Contract requirements that are in excess of the applicable codes, rules, or regulations. The contract provisions shall be given precedence, unless special permission is granted by the Consultant.
5. Comply with the requirements of the federal, state, and local regulations related to asbestos as listed in herein.
6. Erect OSHA-specified warning signs around the workspace and at every point of potential entry from the outside including the entrance to the decontamination facility's clean room. The signs shall conform to OSHA requirements with the words "Danger, Asbestos Hazard, and Do Not Enter." The warning signs shall be a bright color so that they can be easily noticed. The size of the sign and its lettering shall be no less than OSHA requirements.
7. Provide OSHA and DOT-required labels as well as NESHAPS labeling requirements for all plastic bags and drums utilized to transport contaminated material from the work areas to the EPA approved disposal landfill.
8. Provide any other signs, labels, warnings, and posted instructions that are necessary to protect, inform and warn workers and visitors of the hazard from asbestos exposure. Also, post in a prominent and convenient place (i.e. the clean room of the decontamination facility) for worker's use a copy of the latest applicable regulations of OSHA, EPA, and NIOSH; and a copy of these Specifications.

**B. Electrical Safety Requirements:**

1. The non-current carrying parts of fixed, portable, and plug-connected equipment shall be grounded. Portable tools and appliances protected by an approved system of double insulation need not be grounded. All light and power circuits in asbestos removal areas shall be ground fault protected.
  2. Extension cords shall be the 3-wire type, shall be protected from damage, and shall not be fastened with staples, hung from nails, or suspended from wires. Splices shall have soldered wire connections with insulation equal to the cable. Worn or frayed cords shall not be used.
  3. Safe lighting equipment shall be provided with a preference for floodlights rather than indiscriminate use of unprotected lamps hung from temporary wiring. Exposed bulbs shall be guarded to prevent accidental contact. Temporary wiring shall be properly insulated and substantially supported. Circuits shall be designed and fused. All temporary lighting inside the asbestos work area shall be waterproofed.
  4. Receptacles for attachment plugs shall be approved, concealed contact type. Where different voltages, frequencies, or types of current are supplied, receptacles shall be of such design that attachment plugs are not interchangeable.
  5. Each disconnecting means for motors and appliances and each service feeder or branch circuit at the point where it originates shall be legibly marked to indicate its purpose.
  6. Coordinate all power requirements with the District, including ground fault interrupted (GFI) panel design and extension cord requirements.
- C. Scaffolding, Rigging, and Hoisting:
1. Unless otherwise specified, provide all scaffolding, rigging, hoisting, and other services necessary to complete the Work.
  2. Remove all equipment from the project site when no longer required, unless written authorization is given by the District and/or Consultant.
- D. Emergency Precautions:
1. Establish emergency and fire exits from the work area for the workers. All emergency exits that must pass through a work area shall be equipped with two (2) full sets of protective clothing and respirators at all times.
  2. Notify only the District and parties that are required by law to be notified. District and Consultant shall determine if any agencies other than those required by the law shall be notified.
  3. Be prepared to administer appropriate first aid to injured personnel at the site after decontamination. Seriously injured personnel shall be treated immediately in the work area or evacuated without performing decontamination. When an injury occurs, stop work and implement fiber reduction techniques (e.g., water spraying) until the injured person has been removed from the work area.

**PART 2 - PRODUCTS****2.1 GENERAL**

- A. No materials, equipment, or tools belonging to the District shall be used by the Contractor, except in case of an emergency and upon explicit authorization by the District.
- B. Deliver all materials and equipment to the site in the original containers bearing the name of the manufacturer and details for proper storage and usage.
- C. All materials or equipment delivered to the site shall be unloaded, temporarily stored, and transferred to the work area in a manner, which shall not interfere with operations of the District.
- D. The District and/or Consultant must approve unloading and temporary storage sites and transfer routes in advance.
- E. Damaged or deteriorated materials may not be used and must be promptly removed from the project site. Materials, that have become contaminated by asbestos-containing materials shall be packaged as ACM, and disposed of in an approved, secure asbestos landfill.
- F. All materials, tools, and equipment must comply at a minimum with this specification and all applicable federal, state, and local regulations.

## 2.2 MATERIALS

- A. Plastic Sheeting: Sheet shall be fire-retardant polyethylene sized in lengths and widths to minimize the frequency of joints. The minimum thickness shall be that which prevents release of asbestos through tearing, separation, or other reasonably foreseeable means, and in no case shall be thinner than:
  - 1. 6-mil thick (0.15 mm) for use as wall and floor barriers.
  - 2. 4-mil thick for use as ceiling barriers and for all other uses.
- B. Plastic Bags: Bags shall be 6-mil (0.15 mm) minimum polyethylene, or sufficiently thicker for large bags so as to prevent release of asbestos through tearing, separation or other reasonably foreseeable means and shall be labeled with OSHA asbestos warning or capable of being so labeled.
- C. Tape: Tape shall be capable of sealing joints of adjacent sheets of plastic and of attaching plastic sheet to finished or unfinished surfaces of dissimilar materials, and shall be capable of adhering under dry and wet conditions, including wetting by amended water.
- D. Glue: Glue shall be capable of sealing plastic to finished surfaces without damaging the surfaces when removed. Mist or water, encapsulating agent, or any other materials to be used in the work area must not affect the bonding strength and resulting seal integrity.
- E. Surfactants (Wetting Agents): Surfactants shall be used so as to produce a material that result in wetting of the asbestos-containing material and retardation of fiber release during disturbance of the material equal to or greater than that provided by the use of

one ounce of a surfactant consisting of 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with five gallons of water. Surfactants shall be certified by their manufacturer as complying with EPA regulations controlling the use of volatile organic compounds, and such State and local regulations under an EPA-approved State Implementation Plan.

- F. Encapsulants: Encapsulants shall be classified or certified by Underwriters Laboratories, and shall not degrade the function of any replacement material. They shall be certified by their manufacturer as complying with EPA regulations controlling the use of volatile organic compounds, and such State and local regulations under an EPA-approved State Implementation Plan. For use with fireproofing, any replacement fire-resistive assembly including an encapsulant shall meet the requirements of this specification and existing building requirements, whichever are more stringent, and:
1. Bulk encapsulants. When used as a bulk encapsulant (penetrating or bridging) on fireproofing, the combination of encapsulant and specific fireproofing (trade name) to which it is applied shall be classified or certified by Underwriters Laboratories, and have a maximum flame spread value of 5 or 10 for exposed or concealed fireproofing, respectively, and smoke developed value of 0, when tested in accordance with ASTM Method E 84 or UL Standard 723.
  2. Lock-down (post-removal) encapsulants. When used as a lock-down (post-removal) encapsulant on a surface after removal of asbestos-containing material, the encapsulant must be classified or certified by UL for use with the specific fireproofing material (trade name) and applied at the specified rate of application.
- G. Asbestos disposal packaging: Packaging shall be suitable to receive and retain any asbestos-containing materials until disposal or conversion at an approved site. The packaging shall be both air and watertight.
1. Labeling. Packaging of asbestos-containing material shall be labeled in accordance with regulations of EPA (e.g., 40 CFR 61.150), OSHA (e.g., 29 CFR 1926.1101, 8 CCR 1529), DOT (e.g., 49 CFR 172.400, 172.446; except for limited quantity shipments which are not being shipped by air (49 CFR 172.203, 173.155), and State or local occupational safety and health, or environmental agencies (where applicable).
  2. Marking. Packaging of asbestos-containing material shall be marked in accordance with DOT regulations (e.g., 49 CFR 172.300); except for limited quantity shipments (49 CFR 172.301).
- H. Warning Signs: Signs shall be as required by EPA (e.g., 40 CFR 61.150), OSHA (e.g., 29 CFR 1926.1101, 8 CCR 1529), State occupational safety and health or environmental agencies (where applicable), and this contract.
- I. Glove bags: Bags shall be made of 10 10-mil (0.25 mm) minimum clear polyethylene. Bag shape shall include "shoulders" to be used with straps. Sizes and shapes chosen shall be suitable for the pipe and fitting formations included in this contract. The bags shall have a closure system, such as a double zipper or self-closing cloth strip. The bags shall have a zipper lock or equivalent feature, which seals the lower part of the bag from the top part to remove asbestos-containing debris.
- J. Brushes: All brushes shall have nylon bristles. Wire brushes are excluded from use

due to their potential to shred asbestos fibers into smaller fibers. Wire brushes may be used on pipe joint insulation upon prior written approval from the District and Consultant.

### 2.3 TOOLS AND EQUIPMENT

- A. Airless Sprayer: Amended water and surface sealers shall be applied with an airless or other low-pressure sprayer or injector suitable for the specific application.
- B. HEPA-Filtered Exhausts: Air inside the asbestos removal area shall be exhausted to the atmosphere (i.e. building exterior) through a High Efficiency Particulate Air (HEPA) filter.
  - 1. A sufficient number of HEPA-filtered portable exhaust units shall be provided for each work area in order to provide:
    - a. At least four (4) complete changes of air per hour;
    - b. An inward velocity through all openings of at least 200 fpm;
    - c. A static negative pressure of at least 0.02 inches of water.
  - 2. The HEPA-filter shall be preceded by replaceable pre-filters and the unit must be designed such that it cannot be operated unless the HEPA-filter is in place.
  - 3. The units must be designed with lights and alarms that indicate that the filters are properly installed and function and that determine when the filters must be changed.
  - 4. Flexible metal or similar materials hose(s) (e.g. ducts) of sufficient length must also be provided to allow the units to discharge to the exterior of the building.
- C. Vacuum Equipment: All vacuum equipment used for cleaning up shall be HEPA-filtered. At least one HEPA vacuum shall be equipped with floor (hard surface and carpet) cleaning attachments.
- D. Scaffolding/Staging/Ladders: Shall meet OSHA safety regulations, including 29 CFR 1926.450-452. Where electrical power and water are used inside a work area, no electrically conductive ladders (e.g., aluminum or steel) shall be used (except for hinges and feet).
- E. Transportation: Transportation methods shall comply with the provisions of EPA Title 40, Part 61, Subparts A, and B and with any hazardous or special waste regulations for temporary storage, transport, and disposal if such codes are enforced in states or cities where the waste will be generated, stored, transported, or disposed of. All containers shall be labeled in accordance with 8 CCR 1529, 29 CFR 1926.58(K) (2), 40 CFR 61, Subparts A and M, and 49 CFR Parts 171 and 172, Hazardous Waste Substances: Final Rule.
- F. Other Tools and Equipment: Furnish all equipment such as lumber, nails, ladders, HEPA vacuums, and hardware and supplies, which may be required to construct and dismantle the decontamination areas and the barriers that isolate the work area. Provide other suitable tools for the abatement activities including but not limited to: hand scrapers, wire brushes, sponges, mops, and shovels.

- G. Electrical: Electrical tools and equipment shall meet all applicable codes and regulations, including, in particular, 8 CCR 1760, 29 CFR 1910.304 and 29 CFR 1926.400-449.
1. Grounding. Ground fault circuit-interrupters shall always be used for all electrical equipment, except to the extent provided in an assured equipment grounding conductor program, 29 CFR 1926.404, if established and implemented in the Plan of Action.
  2. Additional requirements. Other OSHA requirements for equipment grounding conductors, beyond those described in the grounding paragraph, apply.

**PART 3 - EXECUTION****3.1 WORK AREA PREPARATION**

- A. Prepare the work area as described in this section. Preparation work shall be performed according to the following general sequence of steps and procedures to insure that proper containment and protection systems are installed prior to any work, which could generate airborne asbestos fibers:
1. Remove and relocate any non-fixed items (not removed by the District) to storage areas designated by the District.
  2. HVAC: Isolate, clean by HEPA vacuuming and washing, and seal airtight with plastic and tape all HVAC system diffuses, grills, and registers in or servicing the work area.
  3. Pre-cleaning: Carefully clean all surfaces in the work area that may be contaminated with any dust or debris by using wet methods and a vacuum equipped with a HEPA filter. Comply with Article "Pre-Cleaning of Asbestos Contaminated Surfaces."
  4. Isolate all electrical systems as directed by the District and provide temporary power and lighting as required for the work area and affected non-work areas. Comply with Article "Electrical Systems."
  5. Barriers: Cover any window or other opening with polyethylene sheeting. All walls to remain shall also be protected from damage during the work and erect or install Decontamination Facility and HEPA exhaust system.
  6. Installation of Decontamination System: Install the decontamination enclosure system.
  7. Signage: Post adequate warning signs denoting the potential danger of airborne asbestos at designated entrances to work areas including, as a minimum, those described at 29 CFR 1926.1101, 8 CCR 1529, and State occupational safety and health and fire safety regulations (where applicable). Prevent access to posted areas by unauthorized or inadequately protected persons.
  8. Fire equipment: Adequate portable fire extinguisher equipment shall be maintained within the work area meeting at least the requirements of 8 CCR 1922, 29 CFR 1910.157 and (where applicable) State occupational safety and health regulations and fire safety regulations.
- B. Obtain Consultant's approval of all preparation work before starting removal of asbestos material.

**3.2 ELECTRICAL SYSTEMS**

- A. The scope of the required electrical isolation and protection work includes isolation and protection of electrical equipment, which is in the area from which asbestos must be removed, and could therefore possibly become a hazard through contact or water spray short-circuiting. Shutdown of electrical circuits shall include providing labor to monitor, inspect, and service temporary power circuits, lighting, and equipment as required by local codes and regulations. Provide "Lock Out" system on all electrical panels or equipment that will be shut off during the removal process.
- B. Provide temporary lighting in the work area where asbestos removal is performed. Inspect the removal work area for the condition of electrical conduit and junction boxes. Correct all potentially unsafe conditions. Do not proceed with removal work until all potentially unsafe conditions have been corrected.
- C. All materials and workmanship shall conform to the latest editions of the following codes, standards, and specifications:
  - 1. National Electrical Code (NEC) - most recent edition.
  - 2. National Bureau of Standards, Handbook H30, National Electrical Safety Code.
  - 3. State and Local codes, and all other authorities having jurisdiction.
  - 4. Underwriter Laboratories (UL).
  - 5. National Board of Fire Underwriters.
  - 6. California-OSHA.
- D. Temporary lighting and power systems shall meet or exceed all OSHA, state, and local regulations; temporary lighting levels shall meet or exceed OSHA requirements and provide surface lighting for nighttime work.
- E. Visit the site as necessary to investigate existing electrical conditions and isolation requirements.
- F. Prior to switching circuits at panels, review the existing directory. Do not shut down any circuits without advanced notification and approval of the District.
- G. All costs associated with the isolation of electrical systems and installation of temporary power and lighting shall be borne by the Contractor.
- H. Comply with all applicable electrical safety regulations.

**3.3 PRE-CLEANING OF ASBESTOS CONTAMINATED SURFACES**

- A. Cleaning of surfaces that are potentially contaminated with asbestos-containing dust and debris shall be required to prevent this dust from becoming airborne and posing an exposure risk, or interfering with perimeter air monitoring activities. Cleaning action shall be performed as a preliminary exposure control procedure, prior to performing other actions associated with the Work.
- B. Cleaning shall consist of HEPA vacuuming followed by wet mopping or wiping of surfaces in a manner that prevents dust generation, but effectively rids the surface of

all visible debris, dust, film, and grime.

- C. Each HEPA vacuum shall be separately equipped with an airtight, securely attached hose of appropriate length and a collection wand, brush or other special attachment appropriate to the required cleaning task. The equipment shall be operable at all times and shall contain no air leaks. The Consultant will review verification of the efficiency of the equipment's filtration (i.e. manufacturer's equipment data sheets).
- D. Cleaning Procedures:
  - 1. Remove large pieces of debris by hand, and then dry vacuum all surfaces using HEPA filtered equipment and a collection attachment that minimizes dust generation.
  - 2. Lightly wet the surface of any material that produces airborne fibers using an airless sprayer and amended water.
  - 3. Collect, package, label, and dispose of vacuumed material as asbestos-contaminated waste.
  - 4. Thoroughly wet wipe or mop all surfaces to remove any remaining dirt or grime, being careful not to wet or damage any electrical equipment, furniture, or other sensitive surfaces.
  - 5. All surfaces to completely dry, then inspect the surfaces for any visible remaining dirt or fibrous material.
  - 6. HEPA vacuum any remaining dirt or grime using an efficient collection attachment.
  - 7. Collect and pump all wastewater through a 5-micron filter, utilizing a multistage filtration system. Dispose of filtered material and filter as asbestos waste.
  - 8. Request that the Consultant perform a visual inspection of the cleaning work, prior to continuing any other specified actions.

### 3.4 ISOLATION OF OSHA CLASS I (FRIABLE) CONTAINMENT WORK AREAS

- A. Work Area Isolation and Protection for Friable Asbestos-Containing Materials:
  - 1. Isolate the work area for the duration of work by completely closing and sealing all openings and doorways into the work area including, but not limited to, heating and ventilation ducts, doorways, windows, floors and ceiling penetrations, and lighting. Isolation/sealing shall be accomplished by using two (2) layers of 6-mil plastic sheeting taped securely in place, or by caulking, including the construction as noted in numbers 4 and 5 below. The work area shall be protected and sealed airtight to the extent possible, and be subject to the approval of the Consultant.
  - 2. Emergency and fire exits shall be maintained.
  - 3. Shutdown and isolate heating, cooling and ventilating air systems to prevent contamination and fiber dispersal to other areas of the property.
  - 4. Thoroughly pre-clean all dust or debris from any fixed objects, floors, walls, or other equipment within the work area using HEPA vacuuming equipment and wet washing. Do not use dry brooms, brushes, mops, or non-HEPA vacuum cleaners for this pre-cleaning work. Seal all seams, joints, covers, or casings with tape, and enclosed fixed objects or equipment with a minimum of two layers of 6-mil plastic sheeting secured and sealed airtight with duct tape.



5. Cover floor and walls with a minimum two (2) independent layers of 6-mil plastic sheeting, turning each layer up onto walls a minimum of 16" and fasten securely to wall. Cover walls with two (2) layers of 6-mil plastic sheet extending to flow, overlapping the two (2) floor sheets by not less than 12" excluding the turn-up. All joints in plastic sheets shall be taped and glued in a manner to prohibit air movement, and to prevent passage of water or other liquids. The bottom layer of floor poly shall be securely fastened to the floor to prevent creases or slippage that would pose a hazard to workers. Any floor drains or other openings shall be sealed individually with two (2) layers of 6-mil sheeting and tape, and then covered by the remaining two (2) layers of poly. Pits, pumps, and other openings shall be covered to prevent a tripping hazard and then covered with two (2) layers of 6-mil sheeting.
  6. Install work area HEPA-filtered exhaust systems as previously specified in Section 1.6 (J) of these Specifications.
  7. Post warning signs in English and Spanish meeting the requirements of 8 CCR 1529 (k)(7) and OSHA 29 CFR 1926.58 (k)(1) and (k)(2)(ii) at the outside doorway to the decontamination facility which shall be the only non-emergency entrance into the work area. The Consultant may also request that the Contractor post additional warning signs around the work area or at other potential entrances or exposure points in accordance with California Proposition 65.
  8. Warning signs shall be readily visible to any person attempting to enter the work area.
  9. All waste shall be disposed of as hazardous waste and packaged as specified herein.
  10. Negative pressure will be established in the work area by placement and operation of sufficient number of HEPA-filtered portable exhaust units in order to provide:
    - a. At least four (4) complete changes of air per hour;
    - b. An inward velocity through all openings of at least 200 fpm;
    - c. A static negative pressure of at least 0.02 inches of water.
  11. Negative pressure shall be measured and recorded using a pressure differential monitor (manometer or magnehelic-type). The monitor shall be calibrated according to the manufacturer specifications and equipped with a printer.
- B. After the friable asbestos removal work area has been prepared as specified above, request a formal site inspection by the Consultant. No removal, demolition or other disturbance of asbestos-containing material, dust, or debris shall occur until the Consultant has inspected and approved the site preparation work.
- 3.5 ISOLATION OF OSHA CLASS II (NON-FRIABLE) CONTAINMENT WORK AREAS
- A. Work Area Isolation and Protection of Non-Friable Asbestos-Containing Materials Located on the Interior of a Building:
1. Isolate the work area for the duration of work by completely closing and sealing all openings and doorways into the work area including, but not limited to, heating and ventilation ducts, doorways, windows, floors and ceiling penetrations, and lighting. Isolation/sealing shall be accomplished by using two

- (2) layers of 6-mil plastic sheeting taped securely in place, or by caulking. The work area shall be protected and sealed airtight to the extent possible, and be subject to the approval of the Consultant.
2. Emergency and fire exits shall be maintained.
  3. Shutdown and isolate heating, cooling and ventilating air systems to prevent contamination and fiber dispersal to other areas of the property.
  4. Thoroughly pre-clean all dust or debris from any fixed objects, floors, walls, or other equipment within the work area using HEPA vacuuming equipment and wet washing. Do not use dry brooms, brushes, mops, or non-HEPA vacuum cleaners for pre-cleaning work.
  5. Seal all seams, joints, covers, or casings with tape, and enclosed fixed objects or equipment with a minimum of two layers of 6-mil plastic sheeting secured and sealed airtight with duct tape.
  6. Cover walls with one (1) layer of 6-mil plastic sheet extending a minimum of four feet from floor (splashguards). All joints in plastic sheets shall be taped and glued in a manner to prohibit air movement, and to prevent passage of water or other liquids.
  7. Any floor drains or other openings shall be sealed individually with two (2) layers of 6-mil sheeting and tape. Pits, pumps, and other openings shall be covered to prevent a tripping hazard and then covered with two (2) layers of 6-mil sheeting.
  8. Install work area HEPA-filtered exhaust systems as previously specified herein.
  9. Post warning signs in English and Spanish meeting the requirements of 8 CCR 1529 (k)(7) and OSHA 29 CFR 1926.58(k)(1) and (k)(2)(ii) at the outside doorway to the decontamination facility which shall be the only non-emergency entrance into the work area.
  10. Warning signs shall be readily visible to any person attempting to, enter the work area.
  11. All waste will be disposed of as non-hazard waste and packaged as specified herein.
- B. Work Area Isolation and Protection of Non-Friable Asbestos-Containing Roofing Materials:
1. Install plastic sheeting, for use as drop cloths, around the perimeter of the building, where necessary.
  2. Post warning signs in English and Spanish meeting the requirements of 8 CCR 1529 (k)(7) and OSHA 29 CFR 1926.58(k)(1) and (k)(2)(ii) at the edges of the plastic sheeting and at the access point to the roof.
  3. Warning signs shall be readily visible to any person attempting to access the roof of the building.
  4. Isolate roof level heating and ventilation air intake sources or shall arrange with the District to have the ventilation system shut down. The work area shall be subject to the approval of the Consultant.
  5. Seal all seams, joints, covers, or casings with tape, and enclosed fixed objects or equipment with a minimum of two layers of 6-mil plastic sheeting secured and sealed airtight with duct tape.
- C. Work Area Isolation and Protection of Outdoor Non-Friable Asbestos-Containing Cementitious Asbestos-Containing Siding, Shingles, or Transite Panels.
1. Install plastic sheeting, for use as drop cloths, around the perimeter of the

2. building, where removal is to occur.
  2. Post warning signs in English and Spanish meeting the requirements of 8 CCR 1529 (k)(7) and OSHA 29 CFR 1926.58(k)(1) and (k)(2)(ii) at the edges of the plastic sheeting.
  3. Warning signs shall be readily visible to any person approaching the work area.
  4. Isolate the work area from the interior of the building by completely closing and sealing all openings and doorways from the work area into the building including, but not limited to, heating and ventilation ducts, doorways, and windows. The work area shall be subject to the approval of the Consultant.
  5. Seal all seams, joints, covers, or casings with tape, and enclosed fixed objects or equipment with a minimum of two layers of 6-mil plastic sheeting secured and sealed airtight with duct tape.
- D. After the non-friable asbestos removal work area has been prepared as specified above, request a formal site inspection by the Consultant. No removal, demolition or other disturbance of asbestos-containing material, dust, or debris shall occur until the Consultant has inspected and approved the site preparation work.

### 3.6 ISOLATION OF ACCM REMOVAL AREAS

- A. Work Area Isolation and Protection of Asbestos-Containing Materials:
1. For interior work areas, isolate the work area for the duration of work by completely closing and sealing all openings and doorways into the work area including, but not limited to, heating and ventilation ducts, doorways, windows, floors and ceiling penetrations, and lighting. Isolation shall be accomplished by using one (1) layer of 6-mil plastic sheeting taped securely in place, or by caulking, including the construction as noted in number 2 below. The work area shall be protected and sealed airtight to the extent possible, and be subject to the approval of the Consultant.
  2. For exterior work areas, seal all openings and doorways to the interior of the building within the work area including, but not limited to, heating and ventilation ducts, doorways, windows, floors and ceiling penetrations, and lighting. Isolation shall be accomplished by using one (1) layers of 6-mil plastic sheeting taped securely in place, or by caulking. The work area shall be segregated from the interior of the building, to the extent possible, and be subject to the approval of the Consultant.
  3. Emergency and fire exits shall be maintained.
  4. Shutdown and isolate heating, cooling and ventilating air systems to prevent contamination and fiber dispersal to other areas of the property.
  5. Cover floor with one layer of 6-mil plastic sheeting, to serve as a drop cloth.
  6. Post warning signs in English and Spanish meeting the requirements of 8 CCR 1529 (k)(7) and OSHA 29 CFR 1926.58(k)(1) and (k)(2)(ii) at the entry to the work area which shall be the only non-emergency entrance into the work area.
  7. Warning signs shall be readily visible to any person attempting to, enter the work area.
  8. All waste will be disposed of as construction debris and packaged as specified herein.
- B. After the ACCM removal work area has been prepared as specified above, request a

formal site inspection by the Consultant. No removal, demolition or other disturbance of asbestos-containing construction material, dust, or debris shall occur until the Consultant has inspected and approved the site preparation work.

### 3.7 REMOVAL PROCEDURES FOR ALL OPERATIONS

- A. Vacuum cleaners equipped with HEPA filters shall be used to collect all debris and dust containing ACM and PACM.
- B. Wet methods shall be used to control exposure during any asbestos handling, removal, cutting, and clean-up, unless the Contractor can demonstrate that the use of wet methods is infeasible due to (for example) creation of an electrical hazard or safety hazard during roofing abatement. Any exceptions to the requirement for wet methods must be approved in advance by the District or Consultant.
- C. Waste and debris contaminated with asbestos must be promptly cleaned-up and stored in leak-tight containers or impermeably wrapped.

### 3.8 OSHA CLASS I (FRIABLE) REMOVAL PROCEDURES

- A. Friable materials may include the removal of floor tile and adhesive by mechanical methods.
- B. Amended water (wetting agent) mixed and carefully applied using an airless sprayer as specified by the manufacturer, shall continuously be used to control the release of asbestos fibers from the material prior to and during removal. The amended water shall be applied in sufficient quantity to fully penetrate and saturate the material before it is removed. Wetting shall commence up to 24 hours before removal work to ensure effectiveness.
- C. Removal Methods:
  - 1. No asbestos removal work shall begin until the work area has been prepared and approved by the Consultant.
  - 2. Removal workers shall wear minimally half face air-purifying respirators with P-100 filters and protective clothing as previously described throughout all removal, cleanup, and waste handling operations.
  - 3. Small test patches of asbestos material shall be wetted, and then removed and examined by the Consultant and Supervisor to determine degree of saturation prior to removing the bulk of the material. With prior approval, the Contractor may use removal encapsulants instead of amended water; applied per manufacturer's and federal guidelines.
  - 4. After large areas of the asbestos material have been fully wetted and tested, the asbestos shall be carefully removed in small sections by using hand scrapers or other suitable tools or mechanical devices as allowed by federal, state, and local regulations. This includes chemical removal of floor tile mastic in association with mechanical buffers and/or use of a bead blaster.
  - 5. As the material is removed, it shall be promptly wetted and packed into impermeable, labeled 6-mil polyethylene, disposal bags. When each bag is full,

the packaged material shall be sprayed with amended water, sealed (using duct tape or other fastener as approved by the Consultant), and transported to a temporary storage area inside the work area.

6. Repeatedly spray the material to prevent it from drying out.
  7. After obtaining written approval of the cleaning from the Consultant, seal all substrate surfaces from which asbestos material was removed with at least one (1) coat of an approved penetrating encapsulant.
  8. Minimize contamination of the work floor, the exterior of disposal containers, and all other surfaces within the work area. At the end of each shift, all surfaces shall be cleaned of all materials and then HEPA vacuumed or wet mopped.
  9. Workers must enter and exit the regulated work area through a decontamination facility. The decontamination facility and work area entry/exit procedures must meet the requirements of 9 CCR 1529 (j)(1).
  10. The decontamination facility shall be wet cleaned (a minimum of two times) using wet cleaning methods upon completion of any waste removal when the worker decontamination facility's shower room alternates as a waste container wash room. The shower room shall be washed with cloths or mops saturated with a detergent solution immediately prior to wet cleaning.
  11. The decontamination facility shall be wet cleaned and HEPA vacuumed, as appropriate, after each shift change and meal break.
  12. Excessive water accumulation or flooding in the work area shall require work to stop until the water is collected and disposed of properly.
- D. Upon completion of removal work, but prior to commencing encapsulation or post-removal cleaning of the work area, request the Consultant conduct an inspection and approve the removal work.

### 3.9 OSHA CLASS II (NON-FRIABLE) REMOVAL PROCEDURES

- A. Non-friable friable materials may include floor tile and adhesive removed by hand tools.
- B. Amended water (wetting agent) mixed and carefully applied using an airless sprayer as specified by the manufacturer, shall continuously be used to control the release of asbestos fibers from the material prior to and during removal. The amended water shall be applied in sufficient quantity to fully saturate the material before it is removed. Wetting shall commence up to 24 hours before removal work to ensure effectiveness.
- C. Removal Methods:
1. No asbestos removal work shall begin until the work area has been prepared and approved by the Consultant.
  2. Removal workers shall wear minimally half face air-purifying respirators with P-100 filters and protective clothing as previously described throughout all removal, cleanup, and waste handling operations.
  3. Small test patches of asbestos material shall be wetted, and then removed and examined by the Consultant and Supervisor to determine degree of saturation prior to removing the bulk of the material. With prior approval, the Contractor may use removal encapsulants instead of amended water; applied per manufacturer's and federal guidelines.
  4. After large areas of the asbestos material have been fully wetted and tested, the

asbestos shall be carefully removed in small sections by using hand scrapers or other suitable hand tools. No tools or equipment shall be used to render material friable without prior approval by District. Floor tile and mastic will be removed with hand tools and wet methods.

5. As the material is removed, it shall be promptly wetted and packed into impermeable, labeled 6-mil polyethylene, disposal bags. When each bag is full, the packaged material shall be sprayed with amended water, sealed (using duct tape or other fastener as approved by the Consultant), and transported to a temporary storage area inside the work area.
6. Material shall not be dropped or thrown to the ground. Removed asbestos-containing roofing material, siding, panels, or shingles shall be passed to the ground by hand or lowered to the ground via a covered, dust-tight chute, crane, or hoist.
7. Repeatedly spray the material to prevent it from drying out.
8. After obtaining written approval of the cleaning from the Consultant, seal all substrate surfaces from which asbestos material was removed with at least one (1) coat of an approved penetrating encapsulant.
9. Minimize contamination of the work floor, the exterior of disposal containers and all other surfaces within the work area. At the end of each shift, all surfaces shall be cleaned of all materials and then HEPA vacuumed or wet mopped.
10. Workers must enter and exit the regulated work area through a decontamination facility. The decontamination facility and work area entry/exit procedures must meet the requirements of 29 CCR 1529 (j)(2).
11. The decontamination facility shall be wet cleaned (a minimum of two times) using wet cleaning methods upon completion of any waste removal when the worker decontamination facility's shower room alternates as a waste container wash room, the shower room shall be washed with cloths or mops saturated with a detergent solution immediately prior to wet cleaning.
12. The decontamination facility shall be wet cleaned and HEPA vacuumed, as appropriate, after each shift change and meal break.
13. Excessive water accumulation or flooding in the work area shall require work to stop until the water is collected and disposed of properly.

D. Upon completion of removal work, but prior to commencing encapsulation or post-removal cleaning of the work area, request the Consultant conduct an inspection and approve the removal work.

E. All asbestos-containing materials shall be removed, gross debris cleaned up, and waste bags removed from the work area prior to approval from the Consultant.

**3.10 ACCM REMOVAL PROCEDURES**

A. Amended water (wetting agent) mixed and carefully applied using an airless sprayer as specified by the manufacturer, shall continuously be used to control the release of asbestos fibers from the material prior to and during removal. The amended water shall be applied in sufficient quantity to fully saturate the material before it is removed. Wetting shall commence up to 24 hours before removal work to ensure effectiveness.

B. Removal Methods:

1. No asbestos removal work shall begin until the work area has been prepared and approved by the Consultant.
  2. Removal workers shall wear half face air-purifying respirators with P-100 filters and protective clothing as previously described throughout all removal, cleanup, and waste handling operations.
  3. Small test patches of asbestos material shall be wetted, and then removed and examined by the Consultant and Supervisor to determine degree of saturation prior to removing the bulk of the material. With prior approval, the Contractor may use removal encapsulants instead of amended water; applied per manufacturer's and federal guidelines.
  4. After large areas of the asbestos material have been fully wetted and tested, the asbestos shall be carefully removed in small sections by using hand scrapers or other suitable hand tools. No tools or equipment shall be used to render material friable without prior approval by District. Floor tile and mastic shall be removed with hand tools and wet methods.
  5. As the material is removed, it shall be promptly wetted and packed into impermeable, labeled 6-mil polyethylene, disposal bags. When each bag is full, the packaged material shall be sprayed with amended water, sealed (using duct tape or other fastener as approved by the Consultant), and transported to a temporary storage area inside the work area.
  6. Repeatedly spray the material to prevent it from drying out.
  7. Minimize contamination of the work floor, the exterior of disposal containers and all other surfaces within the work area. At the end of each shift, all surfaces shall be cleaned of all materials and then HEPA vacuumed or wet mopped.
  8. The decontamination facility shall be wet cleaned (a minimum of two times) using wet cleaning methods upon completion of any waste removal when the worker decontamination facility's shower room alternates as a waste container wash room, the shower room shall be washed with cloths or mops saturated with a detergent solution immediately prior to wet cleaning.
  9. Excessive water accumulation or flooding in the work area shall require work to stop until the water is collected and disposed of properly.
- C. Upon completion of removal work, but prior to commencing encapsulation or post-removal cleaning of the work area, request the Consultant conduct an inspection and approve the removal work.

### 3.11 CLEANING AND FINAL DECONTAMINATION

- A. After all asbestos-containing (or contaminated) materials have been removed, remove all wastes and perform a thorough multi-stage final cleanup and decontamination of the work area per the methods indicated below. Final cleaning shall be performed only after all waste is packaged and removed, but prior to re-installing equipment or dismantling any barriers, decontamination facility, or protective coverings. Cleaning shall be performed before a visual inspection and air testing by the Consultant. HEPA-exhaust systems shall operate continuously throughout the cleaning and air testing process until the Consultant authorizes their shutdown and removal from the site. Notify the Consultant at least 24 hours in advance of the expected completion time of site cleaning in order to allow the scheduling of air clearance testing.
- B. Methods and Approvals: Cleaning methods and approvals shall consist of the following

## REMOVAL AND DISPOSAL OF ASBESTOS CONTAINING MATERIALS

tasks performed in the list order:

1. Remove all visible accumulations of asbestos debris on the protective coverings on floors, walls, and other surfaces, and then HEPA vacuum all surfaces to pick up excess water and gross saturated debris.
2. After HEPA vacuuming, the work area air shall be lightly misted (with amended water), and then all protective coverings on ceilings, walls, floors, and other items in the work area shall be wiped thoroughly clean (first cleaning).
3. After completing the above steps (1) and (2), request the Consultant to inspect the site. To facilitate scheduling of this inspection, notify the Consultant of the anticipated completion time of the above initial cleaning work 24 hours in advance.
4. If the Consultant observes any asbestos waste or fibers within the work area during the inspection, perform additional cleanup and decontamination as directed by the Consultant.
5. If the Consultant approves this first cleaning, slowly remove the upper layer of all protective poly coverings on floors, walls, and other surfaces and package them in 6-mil waste bags. The waste bags shall then be removed from the work area. The bottom layer of protective poly coverings, the decontamination facilities, the HEPA exhaust systems, all barrier walls, and seals on HVAC components shall remain in place and in use.
6. After these upper protective coverings are moved, the work area shall be completely wet wiped and vacated for at least twelve (12) hours to allow fiber settling and while the Consultant collects and analyzes a final set of air samples according to NIOSH Method 7400 (PCM).
7. Upon obtaining the Consultant's written approval of final clean work area as specified herein, unless otherwise permitted, drying time shall be as specified by the manufacturer before final air sampling is conducted.
8. After successful completion of final air clearance testing as specified herein, carefully remove in listed order the decontamination facilities, any temporary barrier walls or tunnels, seals on HVAC components. The HEPA exhaust systems shall be removed only after all other items are removed. A HEPA vacuum shall be kept on site during this final disassembly work to cleanup any dust or debris.
9. If any of the post cleaning PCM air sample results are above 0.01 fiber/cc (or a preexisting level of normal background fibers if shown to be higher than 0.01 f/cc by the Consultant), the Consultant may require additional cleaning, decontamination, air testing and a final inspection, which shall be repeated by the Consultant.
10. Workers shall wear approved respiratory and personnel protective equipment throughout all cleanup and waste disposal activities.

### 3.12 DISPOSAL

- A. Determine current waste handling, packaging, labeling, transportation, and disposal regulations for the work site and for each waste disposal landfill. Comply fully with these regulations and all U.S. Department of Transportation, EPA requirements and state and local regulations.
- B. Definition: Wastes are defined as all asbestos-containing or potentially contaminated



materials or other items, which have not been completely cleaned or sealed to the satisfaction of the Consultant, while inside the work area, and must be removed from the job site. Asbestos wastes may include building materials, insulation, disposal clothing and protective equipment, plastic sheeting and tape, exhaust systems or vacuum filters, Contractor equipment, or other materials designated by state or local authorities or the Consultant or which have been potentially contaminated with asbestos and have not been fully cleaned inside the work area by vacuuming followed by thorough washing.

- C. All waste material shall be promptly placed in 6-mil polyethylene bags as it is generated. A sufficient number of waste bags shall be located in the immediate work area, and in the Equipment (dirty) room of the Worker Decontamination Facility. Count the bags and estimate the total volume leaving the work area, and maintain a written record of such (waste log).
- D. Warning labels, having waterproof print and permanent adhesive, imprinted on the sides of all waste bags or transfer containers. All waste bags must have the generator's name and address including area where waste was generated.
- E. A fine water spray shall be used to keep the waste in containers thoroughly wet at all times. When a waste bag is full, it shall be securely sealed with tape or other secure fastener.
- F. The following procedures shall be followed whenever containers or equipment are removed, from the work area:
  - 1. All combustible rubbish and debris, including properly bagged asbestos shall be properly disposed of at the end of each working day.
  - 2. The Clean Room shall be considered a holding area only during the period of active waste transfer for the purpose of the loading of carts or drums. Storage of waste in carts or a drum in the clean room is prohibited.
  - 3. Waste removal shall not occur during worker shift changes or when workers are showering or changing. Care shall be taken to prevent short-circuiting and cycling of air outward through the shower and clean room when used for waste removal.
  - 4. Workers are to be stationed in each room/area of the decontamination facility to transfer the containers and equipment to or from adjacent sections. These workers in the clean room or holding area shall enter from uncontaminated areas with appropriate personal protective equipment; or prior to the start of the waste transfer, these workers shall exit the work area, fully de-contaminated, and subsequently don't clean personal protective equipment.
  - 5. External surfaces of contaminated containers and equipment shall be cleaned by wet cleaning and HEPA-vacuums in the work area before moving such items into the decontamination facility airlock. Workers shall not enter the airlock during this procedure.
  - 6. The containers of waste and the equipment shall be removed from the airlock by workers stationed in the washroom during waste removal operations.
  - 7. Once in the washroom, external surfaces of contaminated containers and equipment shall be cleaned a second time by wet cleaning.
  - 8. The cleaned containers of waste and equipment shall be placed in uncontaminated leak-tight plastic bags (or 6-mil sheeting if physical

characteristics necessitate and permit). Air volume shall be minimized, and the bags or sheeting shall be sealed. Items that may puncture or tear the plastic bags or sheeting shall be placed in a hard wall container such as a drum, and then sealed.

9. The clean re-containerized items shall be moved into the airlock for subsequent transfer to the holding area. The washroom workers shall not enter this airlock or the work area until waste removal is finished for the period.
  10. Re-containerized items and cleaned equipment shall be removed from the air lock to the holding area by workers who have entered from uncontaminated areas with appropriate personal protective equipment.
  11. The re-containerized items of waste and cleaned, bagged equipment shall be placed in open top, watertight plastic carts or drums. The carts or drums shall be HEPA-vacuumed and wet cleaned immediately following the removal of the containers of waste from them, and the location of where they are emptied shall be HEPA-vacuumed.
  12. The exit from the waste decontamination facility shall be monitored and secured at all times to prevent unauthorized entry.
  13. The carts and drums may be temporarily stored in a holding area at the work site outside the work place until a transport vehicle arrives, but such storage areas must be pre-approved by the District.
- G. Waste Container Storage: Sealed waste bags may be temporarily stored in a pre-designated and approved outside area, until a truckload quantity is obtained. The temporary storage area shall be predominantly identified and posted with signs, and waste containers shall be covered with polyethylene sheeting or otherwise protected from further contamination.
- H. Waste Removal Scheduling: All waste containers shall be decontaminated and removed from the site before final cleanup is started and isolation barriers are taken down. Pre-schedule and obtain approval of the Consultant for all time periods during which he desires to re-move waste bags from the facility. Once a truckload of waste containers has accumulated, arrange for transportation to the disposal site. Waste shall not be stored in the work area or waste decontamination facilities. Outside bag, storage must be monitored and secured at all times to prevent tampering. Storage must be in secure areas.
- I. Waste Transportation and Disposal Regulations:
1. Determine and insure compliance with: 1) the current waste handling regulations applicable to each work site; and 2) the current regulations for transporting and disposing, waste at each ultimate disposal landfill. Comply fully with these regulations and with all U.S. Department of Transportation, State, EPA, and all federal and local requirements.
  2. At no additional cost to the District, maintain a valid solid waste transportation registration issued by the California Department of Health Services Toxic Substance Division and obtain, complete, and fully comply with any other local hazardous waste manifesting requirements.
  3. Transportation methods shall comply with the provisions of EPA Title 40, Part 61, Subpart M, Title 22 of the California Administrative Code, Division 4 Environmental Health, Chapter 30, Minimum Standards for Management of Hazardous and Extremely Hazardous Wastes, and with any hazardous waste

regulations for temporary storage, transport, and disposal if such codes are enforced in states where the waste shall be stored, transported or disposed of.

- J. Waste Container Removal and Disposal Procedure:
1. Provide waste packaging, transportation, and approved landfill disposal, plus all related recordkeeping.
  2. Package, label, and remove all asbestos waste as specified. Packaging shall be accomplished in a manner that minimizes waste volume, but ensures waste containers shall not tear or break.
  3. Provide legal transportation of asbestos wastes to the disposal landfill. Verify actual delivery, receipt, and disposal of each load of waste at the design landfill.

### 3.13 FINAL INSPECTION AND TESTING

- A. After a minimum of two (2) thorough cleanings of the work area, if a high degree of cleanliness has been achieved, notify the Consultant that the work area is ready for inspection and final testing. The Consultant and the Contractor shall visually inspect the work area for detection of any visible asbestos dust, debris or other contamination. If the visual inspection does not detect any dust, debris or other signs of contamination, final air testing shall commence.
- B. The final test shall consist of collecting air samples within the work area to establish that the airborne fiber concentrations do not exceed 0.01 f/cc, as determined by transmission electron microscopy (TEM) for Class I removal areas and phase contrast microscopy (PCM) for Class II removal areas. At the discretion of the District TEM may also be employed for one or two of the samples in Class II areas to confirm the results of the final testing via PCM. If the results of the final testing exceed 0.01 f/cc, thorough wet cleaning, and/or HEPA vacuuming shall be repeated until the required clearance levels are achieved.
- C. After achieving the levels of cleanliness and decontamination, as specified herein and as confirmed by the final inspection and air testing, the Consultant and Contractor shall thoroughly inspect the work area to determine whether any damage has been done to finishes, equipment, or any other part of the work space.
- D. Any damage to finishes, floors, walls, or other items or fixtures that have been the result of actions by the Contractor shall be repaired to original condition without any additional cost to District. A comparison to the pre-construction inspection report shall be the basis for the assessment of damages to be addressed.

## **PART 4 - Hazardous Building Materials Survey Information**

**SAN DIEGO UNIFIED SCHOOL DISTRICT  
 PHYSICAL PLANT OPERATIONS  
 ASBESTOS WALL REPORT  
 349 / Mira Mesa High School**

<b>BLDG# / AREA</b>	<b>MATERIAL SAMPLED</b>	<b>ASBESTOS PRESENT???</b>
<b>01-01 Admin</b>	Interior wall plaster	<b>Negative</b>
	Exterior wall stucco	<b>Negative</b>
<b>01-02 200</b>	Interior wall plaster	<b>Negative</b>
	Exterior wall stucco	<b>Negative</b>
<b>01-03 300</b>	Interior wall plaster	<b>Negative</b>
	Exterior wall stucco	<b>Negative</b>
<b>01-04 400</b>	Interior wall plaster	<b>Negative</b>
	Exterior wall stucco	<b>Negative</b>
<b>01-05 500 P.E.</b>	Interior wall plaster	<b>Negative</b>
	Exterior wall stucco	<b>Negative</b>
<b>01-06</b>	Interior wall plaster	<b>Positive</b>
	Exterior wall stucco	<b>Negative</b>
<b>01-09 Stadium Snack</b>	Interior wall plaster	<b>Negative</b>
	Exterior wall stucco	<b>Positive</b>

**ASBESTOS WALL REPORT  
352 / Morse High School**

BLDG# / AREA		MATERIAL SAMPLED	ASBESTOS PRESENT???
01-01	100	Interior Wall Plaster	Positive
		Exterior Wall Stucco	Negative
01-02	200	Interior Wall Plaster	Negative
		Exterior Wall Stucco	Negative
01-03	300	Interior Wall Plaster	Positive
		Exterior Wall Stucco	Negative
01-04	400	Interior Wall Plaster	Positive
		Exterior Wall Stucco	Negative
01-05	500	Interior Wall Plaster	Negative
		Exterior Wall Stucco	Negative
01-06	600	Interior Wall Plaster	Negative
		Exterior Wall Stucco	Positive
01-07	ADMIN	Interior Wall Plaster	Positive
		Exterior Wall Stucco	Negative
01-08	800	Interior Wall Plaster	Positive
		Exterior Wall Stucco	Negative
01-09	ROTC	Interior Wall Plaster	Negative
		Exterior Wall Stucco	Negative
01-10	CAFE	Interior Wall Plaster	Negative
		Exterior Wall Stucco	Positive
01-11	P.E.	Interior Wall Plaster	Negative
		Exterior Wall Stucco	Negative
01-15	Storage	Exterior Wall Stucco	Negative
01-16	Storage	Exterior Wall Stucco	Negative

**ASBESTOS WALL REPORT  
235 / Penn Elementary**

BLDG#/EMI#	FUNCTIONAL SPACE/AREA	TYPE OF MATERIAL	SAMPLE RESULT
<b>INTERIOR AND EXTERIOR WALLS IN THE <i>PERMANENT BUILDINGS</i> AT THIS SITE ARE NEGATIVE. INTERIOR WALLS IN PORTABLE CLASSROOMS ARE WOOD PANELING.</b>			
<b>A8049 61136</b>	1-Portable Bldg. A80490/B-	Exterior stucco	<b>NEGATIVE</b>
<b>A8060 61137</b>	1-Portable Bldg. A80600/B-	Exterior stucco	<b>NEGATIVE</b>
<b>A8080 61138</b>	1-Portable Bldg. A80800/B-	Exterior stucco	<b>NEGATIVE</b>
<b>91025 61139</b>	1-Portable Bldg. 91025/B-	Exterior stucco	<b>NEGATIVE</b>
<b>91026 61140</b>	1-Portable Bldg. 91026/B-	Exterior stucco	<b>NEGATIVE</b>
<b>A9104 61141</b>	1-Portable Bldg. A91041/B-	Exterior stucco	<b>POSITIVE</b>
<b>A9122 61142</b>	1-Portable Bldg. A91220/B-	Exterior stucco	<b>POSITIVE</b>
<b>A9129 61143</b>	1-Portable Bldg. A91297/B-	Exterior stucco	<b>POSITIVE</b>
<b>A9132 61144</b>	1-Portable Bldg. A91329/B-	Exterior stucco	<b>POSITIVE</b>
<b>91356 61145</b>	1-Portable RR/Bldg. 91356T	Exterior stucco	<b>POSITIVE</b>
<b>A9136 61146</b>	1-Portable Bldg. A91361/B-	Exterior stucco	<b>POSITIVE</b>
<b>A9136 61147</b>	1-Portable Bldg. A91362/B-	Exterior stucco	<b>POSITIVE</b>
<b>A9136 61148</b>	1-Portable Bldg. A91363/B-	Exterior stucco	<b>POSITIVE</b>
<b>A9151 61149</b>	1-Portable Bldg. A91510/ B-18/B-19	Exterior stucco	<b>POSITIVE</b>
<b>A9154 61150</b>	1-Portable Bldg. A91543/B-	Exterior stucco	<b>POSITIVE</b>
<b>A9167 68180</b>	1-Portable Bldg. A91673/B-	Exterior stucco	<b>NEGATIVE</b>

**ASBESTOS WALL REPORT  
357 / Serra High School**

<b>BLDG# / AREA</b>	<b>MATERIAL SAMPLED</b>	<b>ASBESTOS PRESENT???</b>
<b>01-01     100 Admin</b>	Interior wall plaster	<b>Negative</b>
	Exterior wall stucco	<b>Negative</b>
<b>01-02     200</b>	Interior wall plaster	<b>Negative</b>
	Exterior wall stucco	<b>Negative</b>
<b>01-03     300</b>	Interior wall plaster	<b>Negative</b>
	Exterior wall stucco	<b>Negative</b>
<b>01-04     Café- 400</b>	Interior wall plaster	<b>Negative</b>
	Exterior wall stucco	<b>Negative</b>
<b>01-05     P.E.</b>	Interior wall plaster	<b>Negative</b>
	Exterior wall stucco	<b>Negative</b>

**END OF SECTION 02 82 33**

San Diego Unified School District Guide Specifications  
Section Version November 2015