



## Asbestos and Lead Specification

ABC Buildings  
15774 Golden West Street  
Huntington Beach, California 92647

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## **1.0 GENERAL**

### **1.1 SUPPLEMENTAL CONDITIONS**

Contractor shall abide by the Coast Community College District (Owner) terms and conditions. If there is a conflict between the terms and conditions and this specification the most stringent shall apply.

### **1.2 COMPLIANCE AND SUMMARY OF WORK**

- 1.2.1 The contractor is responsible for repair, to the satisfaction of the Owner, of the areas/surfaces not scheduled for the planned demolition that becomes damaged because of his/her work. All unscheduled repair work shall be at no expense to the Owner.
- 1.2.2 This project includes the removal and disposal of asbestos-containing materials (ACMs), asbestos-containing construction materials (ACCMs), and removal and disposal of loose and flaking lead-based paint (LBP) and lead-containing paint (LCP). It is necessary for the abatement contractor to coordinate all abatement work with the Owner and/or Owner's representative. During all work, provide monitoring and personal protective equipment (PPE) in accordance with the Federal and State Occupational Safety and Health Administration (OSHA), and as required by this specification. Where there is conflict, the most stringent requirement shall apply.
- 1.2.3 The work covered by this specification includes the handling, removal, and proper disposal of asbestos and lead-containing materials impacted by the planned demolition activities.
- 1.2.4 Furnish all labor, materials, facilities, equipment, services, employee training, medical surveillance, permits, notifications, and agreements necessary to perform the work required for asbestos and lead abatement in accordance with federal and state requirements, this specification, and the Owner's terms and conditions.
- 1.2.5 Comply with all Federal, State, and Local regulations pertaining to asbestos and lead removal, storage, transportation, and disposal, employee health and safety, Contractor certifications, hazardous materials certifications, and all licenses, permits, and training.
- 1.2.6 Perform all work specified herein with competent persons trained, knowledgeable and qualified in state-of-the-art techniques relating to asbestos and lead abatement, handling, disposal, and the subsequent cleaning of contaminated areas.
- 1.2.7 Perform appropriate Total Threshold Limit Concentration (TTLC), Soluble Threshold Limit Concentration (STLC), and Toxicity Characteristic Leaching Procedure (TCLP) testing for lead waste disposal as necessary. All testing shall be done in the presence of the Owner's Environmental Consultant. Chain-of-custody forms shall be provided to the Owner and the Environmental Consultant within 72-hours following sample delivery to the laboratory.

- 1.2.8 During asbestos removal activities, the Contractor shall protect against contamination of adjacent areas and shall ensure that there is no airborne release of hazardous materials and dusts. The Owner has the option to collect perimeter air samples as necessary in adjacent areas to evaluate the Contractor's performance. Evidence of settled dust or airborne levels of contaminants above background and/or Environmental Protection Agency (EPA) recommended clearance criteria of 0.01 fibers per cubic centimeter (f/cc) of air for airborne fibers will require the implementation of additional dust controls at no extra cost to the Owner.
- 1.2.9 It is the Contractor's responsibility to determine the quantities of asbestos and lead-containing materials impacted by the planned demolition work. The contractor should not rely on quantities included in the asbestos and lead assessment report. The Contractor shall conduct a site visit to determine exact locations of materials impacted by the construction/demolition work. This section provides appropriate protocols for handling and disposal of asbestos and lead-containing materials. The subject materials shall be removed according to the procedures outlined in this specification. If additional suspect hazardous materials are discovered during the abatement work, immediately notify the Owner and/or the site Environmental Consultant.
- 1.2.10 The work of this section shall be performed by an entity that holds a current, valid asbestos handling license issued by the California Contractor's State Licensing Board (CSLB) and a current valid Certificate of Registration for Asbestos-Related Work issued by the California Department of Industrial Relations, Division of Occupational Safety and Health (Cal-OSHA). Display copies of CSLB license and Cal-OSHA Certificates in a visible place at the jobsite.
- 1.2.11 Contractor shall be registered with the California Department of Public Health (CDPH) as a lead abatement contractor to perform lead abatement work specified herein.
- 1.2.12 Asbestos and lead removed during the abatement activities shall be disposed of in an approved manner complying with all applicable Federal, State, and Local regulations. Appropriate waste manifests or letters of salvage shall be furnished to the Owner thereby limiting the Owner's liability for improperly salvaged items. Materials are conveyed to the Contractor "as is," without any warranty, expressed or implied, including but not limited to, any warranty to marketability or fitness for a particular purpose, or any purpose. The Owner or the Owner's Environmental Consultant shall approve the non-ACM hazardous waste disposal sites prior to disposal for materials that may be disposed of in that manner.
- 1.2.13 All interior asbestos and lead abatement work shall be conducted using a negative pressure enclosure and three-stage decontamination units.

### 1.3 SCOPE OF WORK

1.3.1 Removal and Disposal of the asbestos-containing materials (ACMs): Table 1 provides description, general locations, asbestos content and estimated square footages.

Table 1  
Asbestos-Containing Materials (ACMs)

Material Description	General Material Location	Asbestos content	Estimated Square Feet
12"x12" beige vinyl floor tile with associated black mastic	Bldg. 26, Old Criminal Justic	3-4% Chrysotile	1,800
White pipe tape with black mastic	Bldg. 3 Business room 113	5% Chrysotile	20
Black pipe mastic	Bldg. 3 Business room 113	5% Chrysotile	25
9"x9" vinyl floor tile with associated black mastic	Bldg. 3 Business room 203, closet	5% Chrysotile	75
Gray gasket	Detached Admin, pipes, throughout Mechanical Room	4% Chrysotile	50
12"x12" white vinyl floor tile with associated black mastic	Bldg. 4 Admin, Room 219	3-4% Chrysotile	130

1.3.2 Removal and Disposal of the asbestos-containing construction materials (ACCMs): Table 2 provides description, general locations, asbestos content and estimated square footages.

Table 2  
Asbestos-Containing Construction Materials (ACCMs)

Material Description	General Material Location	Asbestos content	Estimated Square Feet
Yellow/gray stucco	Bldg. 4, Administration, throughout exterior	<0.2 Chrysotile	18,000

***The estimated quantities are based on a visual assessment and shall not be used for bidding purposes. The licensed asbestos contractor must field verify the quantities of the ACMs and ACCMs and not rely on the estimated quantities in this specification and the assessment report.***

1.3.3 Removal and disposal of LBP: The abatement Contractor shall remove any loose, stratified, blistered or chalky and peeling paint that can be removed by hand scraping, or that may require removal prior to demolition. Table 3 provides description, general locations, lead content and estimated square footages.

Table 3  
Lead-Based Paint (LBP)

Paint Color	Components	General Sample Location	Lead Concentrations	Estimated Square Feet
Brown	Handrail	Building 4 Admin, Student Center, metal handrail to 2 <sup>nd</sup> floor	1.5 %wt.	100
Black	Door jamb	Building 4 Admin, Student Center, wood door	0.96 %wt.	400

- 1.3.4 Removal and disposal of LCP: The abatement Contractor shall remove any loose, stratified, blistered or chalky and peeling paint that can be removed by hand scraping, or that may require removal prior to demolition. Table 4 provides description, general locations, lead content and estimated square footages.

Table 4  
Lead-Containing Paint (LCP)

Paint Color	Components	General Sample Location	Lead Concentrations	Estimated Square Feet
Blue	Locker	Building 26, metal locker	0.23 %wt.	300
Black	Door jamb	Building 26, metal door jamb	0.024 %wt.	500
Green	Floor	Building 26, exterior concrete floor	0.0067 %wt.	10,000
White	Flashing	Building 26, roof, metal flashing	0.014 %wt.	350
Black	Door jamb	Building 3 Business, wood door jamb, room 211	0.26 %wt.	600
Orange	Wall	Building 3 Business, exterior stucco wall	0.10 %wt.	12,000
White	Wall	Building 3 Business, interior drywall	0.051 %wt.	10,000
Beige	Wall	Building 3 Business, plaster wall	0.027 %wt.	11,000
Green	Compressor	Detached Admin Restroom/mechanical room	0.46 %wt.	25
Gray	Braker box	Detached Admin Restroom/mechanical room, metal breaker box	0.13 %wt.	40
Light green	Door jamb	Building 4 Admin, 1 <sup>st</sup> floor, SE office, wood door	0.17 %wt.	200
Gray	Door frame	Building 4 Admin, Student Center, wood door	0.22 %wt.	300
Light blue	Wall	Building 4 Admin, Student Center, interior drywall	0.075 %wt.	350
White	Wall	Building 4 Admin, Student Center, men's restroom 2"x2" ceramic tile Wall	1040 mg/kg	1,000

Impacting painted surfaces that have over 600 parts per million (ppm) of lead requires the employer to determine if workers are exposed above the Permissible Exposure Limit (PEL).

Regulation: 8CCR 1532.1

***The estimated quantities are based on a visual assessment and shall not be used for bidding purposes. The licensed abatement contractor must field verify the quantities of the LBP and LCP and not rely on the estimated quantities in this specification and the assessment report.***

## 1.4 DEFINITIONS

Abatement - Asbestos: Process of controlling fiber release from asbestos-containing materials, including encapsulation, enclosure, controlled demolition procedures, removal, clean up and disposal as required prior to demolition.

**Abatement - Lead-based Paint:** Process of removal, clean up and disposal of lead-contamination or lead-based paint from building surfaces as required prior to demolition work.

**Asbestos-Containing Material (ACM)** is defined as any material containing more than one percent (>1%) asbestos.

**Asbestos-Containing Construction Material (ACCM)** is defined as any manufactured construction material, which contains more than 1/10<sup>th</sup> of 1% asbestos by weight. Cal-OSHA

**Action Level - Lead:** Employee exposure without regard to the use of respirators, to an airborne concentration of 30 micrograms per cubic meter of air (30 µg/m<sup>3</sup>) calculated as an 8-hour time-weighted average (TWA).

**Activity Class/Category - Lead:** The designation assigned to work activities specified for removal of lead-based paints by pressure blasting, grinding, scraping, needle-gunning, chiseling, hammering, or wire brushing. Activity Classes I through III determine the minimum surveillance measures and exposure controls of the Contractor(s).

**Aggressive Sampling:** Refers to air sampling either during or following the agitation of the air.

**AHERA:** Asbestos Hazard Emergency Response Act (40 CFR Part 763).

**Airlock:** A system for permitting ingress and egress with minimum air movement between a contaminated area and uncontaminated areas. Typically consists of two curtained doorways separated by a distance of at least six feet such that one passes through one doorway into the airlock, allowing the doorway to close off the opening. This airlock must be always maintained in uncontaminated condition.

**Ambient Air Quality:** The quality of air (in terms of airborne fiber content) that is present in each space.

**Area Monitoring:** Sampling of airborne asbestos fiber concentrations within the work area and outside the work area. Sampling shall represent airborne concentrations that may reach the breathing zone.

**Asbestos Fibers:** Refers to asbestos fibers having an aspect ratio of 3:1, and those fibers longer than five (5) micrometers.

**Asbestos Permissible Exposure Limit (PEL):** A level of airborne fibers specified by OSHA as an occupational exposure standard for asbestos. This level represents the 8-hour time-weighted average of 0.1 fibers per cubic centimeter as measured by Phase Contrast Microscopy (PCM) analytical method.

**Asbestos:** Asbestos includes asbestiform varieties of serpentine (chrysotile), riebeckite (crocidolite) cummingtonite-gunerite (amosite), anthophyllite, tremolite, and actinolite. For the purposes of determining worker respiratory protection, both the asbestiform and non-asbestiform of the above minerals, and any chemically treated or altered materials shall be considered as asbestos.



**Authorized Visitor:** Designated employees or consultants for the Owner and representatives of any federal, state, and local regulatory or other agency having jurisdiction over the project.

**B Reader:** A radiologist skilled in evaluating X-rays of people exposed to asbestos.

**Blood Lead Testing:** All employees working on the job shall submit both pre-job and post-job blood lead testing results. Results shall be taken no more than 30 days before and after the 1st and last day of work on site.

**Baseline:** Refers to the background level of asbestos monitored before abatement.

**Breathing Zone:** A hemisphere forward of the shoulders and head with a radius of approximately six to nine inches.

**Breaching:** A rift or gap in the critical or secondary barriers that allow egress of air from the containment to outside, or vice versa.

**Bridging Encapsulant:** An encapsulant that forms a discrete layer on the surface of an in-situ asbestos matrix.

**CAL/OSHA:** State of California, Occupational Safety & Health Administration, enforcement of the California Department of Labor related to worker protection laws.

**Chain-of-Custody:** A legal concept involving documentation of the physical possession of a sample(s) from the moment it is collected, transported, analyzed, and ultimately stored in an archive.

**Change Rooms:** Refers to the two chambers in the decontamination area used to change into and out of protective clothing.

**Certified Industrial Hygienist (CIH):** A person certified by the American Board of Industrial Hygiene retained by contractor.

**Certified Asbestos Consultant (CAC):** A CAC defined in Title 8 of California Code of Regulations (CCR), Section 1529 as person who contracts to provide professional health and safety services relating to asbestos-containing construction material as defined in this subsection, which comprises 100 square feet or more of surface area. The activities of an asbestos consultant include building inspection, abatement project design, contract administration, sample collection, preparation of asbestos management plans, clearance monitoring, and supervision of site surveillance technicians.

**Certified Site Surveillance Technician (CSST):** means any person who acts as an independent on-site representative of an asbestos consultant. The site surveillance technician monitors the asbestos abatement activities of others, provide asbestos air monitoring services for area and personal samples, and perform building surveys and contract administration at the direction of an asbestos consultant.

**Clean Room:** An uncontaminated area or room that is part of the worker decontamination enclosure system, with provisions for storage of workers' street clothes and protective equipment.

**Clearance Level:** Clearance level for samples analyzed by Transmission Electron Microscopy (TEM) will be less than 70 structures per square millimeter ( $< 70 \text{ s/mm}^2$ ). Clearance level for samples analyzed by Phase Contrast Microscopy (PCM) will be less than 0.01 fibers per cubic centimeter of air ( $< 0.01 \text{ f/cc}$ ). Samples shall be collected by aggressive sampling methods, and the minimum air volume shall be 1,200 liters.

**Competent Person:** One who can identify existing and predictable asbestos hazards and who has the authority to take prompt corrective measures to eliminate them.

**Consulting CIH:** Owner-retained Certified Industrial Hygienist or monitoring technician working under guidance of consulting CIH.

**Critical Barrier:** A unit of temporary construction that provides the only separation between asbestos work area and an adjacent potential occupied space. This includes the decontamination unit, perimeter walls, ceilings, penetrations and any temporary critical barriers between the work area and the uncontaminated environment.

**CSLB:** Contractors State Licensing Board

**Decontamination Area:** Area which is constructed to provide the means for workers to store clothing, equipment, and other articles, and to properly remove asbestos contamination upon concluding work activities that result in exposure to these hazardous materials.

**CDPH:** California Department of Public Health

**DOP:** Dioctylphthalate, the challenge aerosol used to perform on-site leak testing of HEPA filtration equipment.

**DOT:** Federal Department of Transportation

**DOSH:** Division of Occupational Safety & Health

**Decontamination Unit:** A decontamination unit shall be set up for each containment area. Refers to system of airlocks used to decontaminate personnel, waste bags, equipment, etc. when exiting the work area.

**Demolition:** The wrecking or taking out of any building component, system, finish, or assembly of the subject building with any related handling operations.

**Disposal Bag:** Minimum six (6) mil thick leak-tight plastic bags used for transporting asbestos waste from workplace, and to disposal site. Each disposal bag must have required labels according to 8 CCR 1529 (Cal-OSHA asbestos rule), 5194 (HAZCOM), 49 CFR 171-179 (USDOT), and 40 CFR 61 Subpart M (NESHAP). Each disposal bag must be labeled with generator's name, address, and site location and generator number.

DANGER  
CONTAINS ASBESTOS FIBERS  
AVOID CREATING DUST  
CANCER & LUNG DISEASE HAZARD  
AVOID BREATHING AIRBORNE ASBESTOS  
RQ WASTE ASBESTOS, 9 NA 2212 PG III  
(Class 9 placard)  
HAZARDOUS WASTE  
STATE AND FEDERAL LAW  
PROHIBITS IMPROPER DISPOSAL  
IF FOUND, CONTACT THE NEAREST  
POLICE OR PUBLIC SAFETY  
AUTHORITY OR THE CALIFORNIA  
DEPARTMENT OF TOXIC SUBSTANCES AND CONTROL

Encapsulant: A liquid material that can be applied to asbestos-containing material that controls the possible release of asbestos fibers from the material either by creating a membrane over the surface (bridging) or by penetrating the material and binding its components together (penetrating encapsulant).

Encapsulation: A specified procedure necessary to coat asbestos-containing material or asbestos contaminated surfaces or for post abatement of containment areas with an encapsulant to control the possible release of asbestos fibers into the ambient air.

Enclosure: The construction of an airtight, impermeable, permanent barrier surrounding the asbestos-containing material to prevent the release of asbestos fibers into the air.

Environmental Consultant: Certified Industrial Hygienist (CIH), Certified Asbestos Consultant (CAC), and/or Certified Site Surveillance technician retained by the Owner.

Equipment Decontamination Enclosure System: A decontamination enclosure system for materials and equipment, typically in a designated area of the work area, and including a washroom, a holding area, and an uncontaminated area.

Equipment Room: A contaminated area or room that is part of the worker decontamination enclosure system, with provisions for storage of contaminated clothing and equipment. The equipment room shall be always kept clean from asbestos-containing debris.

Excursion Limit: A California Code of Regulations (8 CCR 1529) requirement that ensures no employee is exposed to airborne concentration of asbestos more than 1.0 fibers per cubic centimeter of air (1 f/cc) as averaged over a sampling period of thirty (30) minutes.

Filter: A media component used in respirators to remove solid or liquid particles from the inspired air.

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

EPA: Environmental Protection Agency.

HEPA: High Efficiency Particulate Air filter capable of filtering out asbestos particulate of a size 0.3 microns or greater at 99.97 percent efficiency.

Hazardous Waste: In addition to the paint waste, rags and debris are to be treated as hazardous waste if laboratory testing indicates a lead concentration of 5 milligrams per liter or greater using the EPA approved Toxicity Characteristic Leaching Procedure (TCLP) and the state equivalent STLC test.

Friable Asbestos-Containing Material: Material that contains more than 1.0% asbestos by weight, and that can be crumbled, pulverized, or reduced to powder by hand pressure when dry.

Foreman: An individual who fulfills the duties of “competent person” as defined in 29 CFR 1926.1101. This individual must supply documentation of a passing grade in an EPA accredited course in Practices and Procedures in Asbestos Control. The foreman must supervise on-site during all abatement work.

Glove bag: A sack with two inward projecting long sleeve gloves, designed to enclose an object from which an asbestos-containing material is to be removed. Bags shall have a minimum thickness of 12-mil and shall be labeled appropriately.

Glove bag Technique: A method for removing ACM from heating, ventilation, and air conditioning (HVAC) ducts, piping runs, valves, joints, elbows, and other non-planar surfaces. The glove bag is constructed and installed in such a manner that it surrounds the object or material to be removed and contains all asbestos fibers released during the process. Secondary containment shall be provided for all glove-bag work unless noted otherwise.

Gross or Full Abatement Area: Designated rooms, spaces, or areas of the project that have been totally sealed, contained in polyethylene, equipped with decontamination enclosure systems, and placed under negative pressure. A gross or full abatement area shall be constructed (as a minimum) per OSHA Regulation 29 CFR Part 1926.1101.

HEPA Filter Equipment: High efficiency particulate air filtered vacuuming equipment with a filter system capable of collecting and retaining asbestos fibers. Filters shall be of minimum 99.97 percent efficiency for retaining fibers of .3 microns or larger.

HEPA Filter Vacuum Collection Equipment: High efficiency particulate air filtered vacuum collection equipment with a filter system capable of collecting and retaining asbestos fibers. Filters should be of 99.97% efficiency for retaining fibers of 0.3 microns or larger.

High-Efficiency Filter: A filter that removes from air 99.97% or more of monodisperse dioctyl phthalate (DOP) particles having a mean particle diameter of 0.3 micrometers.

Lead: Toxic metallic element of atomic number 82, or any other materials, substances or compounds that may contain lead. Note for metal painted surfaces lead is often found in

combination with chromates. For the purposes of this specification, lead also refers to lead-chromate paints.

**Lead Hazardous Waste:** Rags and general debris are to be treated as a hazardous waste if laboratory results indicate a lead (Pb) concentration of 5 milligrams per liter (mg/l) or greater using the EPA approved TCLP test. The waste will also be classified as hazardous waste if the TTLC of measured lead is greater than 1000 mg/kg or if the STLC of measured lead is greater than or equal to 5 mg/l.

**Lead Permissible Exposure Limit (PEL):** Employee exposure, without regard to the use of respirators, to an airborne concentration of 50 micrograms of lead per cubic meter of air (50 ug/m<sup>3</sup>) averaged over an 8-hour work period.

**Lead Risk/Assessor:** An individual who has been trained by a California Department of Public Health approved training program to conduct risk assessment, sample for the presence of lead in dust and soil and conduct abatement clearance testing.

**Lead Sampling Technician:** An individual who works under the direction of an Inspector/Assessor, can perform sampling activities taking paint chip, dust, or soil samples. Using and XRF machine to test painted surfaces and performing visual assessment.

**Movable Object:** A unit of equipment or furniture in the work area that can be removed from the work area, (e.g., smoke detectors, lights).

**Negative Pressure Respirator:** A respirator in which the air pressure inside the respiratory-inlet covering is positive during exhalation in relation to the air pressure of the outside atmosphere, and negative during inhalation in relation to the air pressure of the outside atmosphere.

**Negative Pressure:** Air pressure lower than surrounding areas, generally caused by exhausting air from a sealed space (work area).

**NESHAP:** National Emission Standard for Hazardous Air Pollutants - EPA Regulation 40 CFR Subpart M, Part 61.

**NIOSH:** National Institute for Occupational Safety and Health: (Research Institute within Federal OSHA). Sets test standards, analytical methods, and certify performance of various respirator designs.

**NIST:** National Institute of Standards and Technology: Administers the NVLAP Program.

**NVLAP:** National Voluntary Laboratory Accreditation Program: Evaluates and certifies laboratories doing PLM and TEM analysis.

**Passive Sampling:** Refers to air sampling with no air agitation.

**Penetrating Encapsulant:** An encapsulant absorbed by the in-situ asbestos matrix without leaving a discrete surface layer.

**Personal Monitoring:** Sampling of asbestos fiber concentrations within the breathing zone of an employee.

**Phase Contrast Microscopy (PCM):** Phase contrast microscopy (PCM) is a technique using a light microscope equipped to provide enhanced contrast between the fibers and the background. Filters are cleared with a chemical solution and viewed through the microscope at a magnification of approximately 400X. This method does not distinguish between fiber types and only counts those fibers longer than 5 micrometers and wider than approximately 0.25 micrometers. Because of these limitations, fiber counts by PCM typically provide only an index of the total concentration of airborne asbestos in the environment monitored.

**Polarized Light Microscopy (PLM):** An optical microscopic technique used to identify asbestos content and distinguish between different types of asbestos fibers by their shape and unique optical properties.

**Powered Air Purifying Respirator (PAPR):** A full-face piece respirator that has the breathing air powered to the wearer after it has been purified through a HEPA filter.

**Protection Factor:** The ratio of the ambient concentration of an airborne substance to the concentration of the substance inside the respirator at the breathing zone of the wearer. The protection factor is a measure of the degree of protection provided by a respirator to the wearer.

**Remodel:** Replacement or improvement of an existing building or portion thereof where exposure to airborne asbestos may result. Remodel includes, but is not limited to, installation of materials, demolition, cutting, patching, and removal of materials of a building.

**Removal encapsulant:** A penetrating encapsulant specifically designed for removal of asbestos containing materials than for in-situ encapsulation.

**Respirator:** A device designed to protect the wearer from the inhalation of harmful contaminants in air.

**Shower Room:** A room between the clean room and the equipment room in the worker decontamination enclosure system. This room contains hot and cold or warm running water and soap suitably arranged for complete showering during decontamination. The shower room comprises an air lock between contaminated and clean areas.

**Soluble Threshold Limit Concentration (STLC):** A material is considered as hazardous waste if laboratory test result indicates Soluble Threshold Limit Concentration of measured lead are greater than or equal to 5 milligrams per liter (mg/l).

**Surfactant:** A chemical wetting agent added to water to improve penetration, thus reducing the quantity of water required for a given operation or area.

**TEM:** Transmission Electron Microscopy: Asbestos structure analysis for a specified volume of air.

TEM is a technique that focuses an electron beam onto a thin sample. As the beam transmits through certain areas of the sample, an image resulting from varying densities of the sample is projected onto a fluorescent screen. Transmission electron microscopy is the state-of-the-art analytical method for identifying asbestos fibers collected in air samples in non-industrial settings. Transmission electron microscopes equipped with selected area electron diffraction (SAED) capabilities also can provide information on the crystal structure of an individual particle.

Toxicity Characteristic Leaching Procedure (TCLP): Test developed by U.S. Environmental Protection Agency (USEPA) to simulate landfill conditions and the potential for a waste to leach hazardous materials (40 CFR 261 - Appendix 2).

Total Threshold Limit Concentration (TTLC): A material is considered as hazardous waste if laboratory test result indicates Total Threshold Limit Concentration of measured lead are greater than or equal to 1000 milligrams per kilogram (mg/kg).

Visible Emissions: Any emissions containing particulate asbestos material that is visually detectable without the aid of instruments. This does not include condensed uncombined water vapor.

Visual Inspection: A visual inspection by Environmental Consultant, of the work area under adequate lighting to ensure that the work area is free of visible asbestos material, debris, and dust.

Washroom: A room between the work area and the holding area in the equipment decontamination enclosure system equipped with water for the decontamination of equipment and sealed waste containers. The washroom or shower room comprises one air lock.

Water Filtration: Refers to water filtration to as small a particulate size as technically feasible, but not more than 5 microns.

Wet Cleaning: The process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, HEPA vacuuming, or other cleaning utensils dampened with amended water or diluted removal encapsulant and afterward thoroughly decontaminated or disposed of as asbestos contaminated waste.

Work Area: The area where asbestos-related work or removal is performed and that is defined or isolated to prevent the spread of asbestos fibers or debris, and entry by unauthorized personnel. Work area is a Regulated Area as defined by 29 CFR 1926.1101 and Cal-OSHA.

Zinc Porphyrin (ZPP) Test: Biological test for lead-exposure that measures the amount of zinc protoporphyrin in blood.

## **1.5 REFERENCES**

A list below forms a part of this specification by reference. The publications are referred to in the text by name only. If there is a conflict between any of the listed regulations or standards, then the most stringent or restrictive shall apply.

### **CALIFORNIA DEPARTMENT OF INDUSTRIAL RELATIONS (CDIR) DIVISION OF OCCUPATIONAL SAFETY AND HEALTH, TITLE 8**

- Construction Safety Orders, Chapter 4, Subchapter 4
- Asbestos Registration, Sections 340-344, 341.6 to 341.14
- Asbestos Construction Standard 1529
- Asbestos Standard 5208
- Lead in Construction 1532.1
- Access to Employee Exposure and Medical Records 3204
- Accident Prevention Program 3203
- Hazard Communication 5194

### **CALIFORNIA DEPARTMENT OF PUBLIC HEALTH (CDPH)**

### **CALIFORNIA CODE OF REGULATIONS (CCR) TITLE 22**

### **GENERAL CONSTRUCTION SAFETY ORDERS**

### **AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)**

- ASTM E1368-14 Standard Practice for Visual Inspection of Asbestos Abatement
- ASTM D 1331 Surface active agent

### **AMERICAN NATIONAL STANDARD INSTITUTE (ANSI)**

- ANSI Z88.2 Respiratory Protection

### **CALIFORNIA ASSEMBLY BILLS (CAB)**

- CAB040 Registration of Contractors

### **CALIFORNIA CODE OF REGULATIONS (CCR)**

- CCR 5208 Title 8

### **CALIFORNIA LABOR CODE (CLC)**

### **CALIFORNIA PROPOSITIONS (CP)**

### **CALIFORNIA STATE BOARD OF EQUALIZATION (CSBE)**

### **CALIFORNIA STATE LICENSE BOARD (CSLB)**



## CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1910, 29 CFR 1926, 40 CFR Part 61, 40 CFR 763

## SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD) RULE 1403

### 1.6 SUBMITTALS

The following items shall be submitted to and approved by Owner's Environmental Consultant before commencing work involving the hazardous materials outlined in these specifications.

- 1.6.1 Detailed work plan from the abatement contractor that includes but is not limited to water and electrical power supply at the site, wastewater discharge from showers and inside the work area, location and number of containments and decontamination units: etc. A schedule showing milestone dates for activities such as mobilization, work area preparation, ACM/ACCM/LBP/LCP removal and waste load-out, lead abatement and load-out, detail cleaning, final clearance evaluations, completion dates, etc.
- 1.6.2 Provide a site safety plan prior to project initiation. The site safety plan shall include, at a minimum:
  - Personal protective equipment,
  - Site safety and health hazards,
  - Fiber release incidents,
  - Control of water leakage or discharge within and/or from the work area,
  - Medical emergency,
  - Asbestos and lead handling procedures,
  - Earthquakes and/or fire emergency procedures,
  - Protocol for responding to complaints or questions from interested parties,
  - 24-Hour emergency telephone numbers for Company Officer with authority to respond to emergencies.
- 1.6.3 Submittal of training records of employees whom Contractor will use on the job.
- 1.6.4 Competent Person (as defined by OSHA Regulation 29 CFR Part 1926.1101: Demonstrate education and specialized training with successful completion of examination of EPA and DHS approved training courses.
- 1.6.5 Workers: Demonstrate education and specialized training with successful completion by EPA and DPH approved training courses.
- 1.6.6 Submit most current certificates (less than 11 months) signed by each employee and trainer that the employee has received proper training in the handling of materials that contain asbestos and lead. Certificate information must include documentation showing that the worker understands the following health implications and risks involved (including the illnesses possible from exposure to airborne asbestos fibers and lead), the use and limits of

the respiratory equipment to be used, and the results of monitoring of airborne quantities of asbestos concerning health and respiratory equipment.

- 1.6.7 Proof of Respirator Fit Testing: Provide proof of qualitative respirator fit testing. Fit testing records must be less than 12 months old and document testing on the type of respiratory protective equipment used for this project.
- 1.6.8 Foreman Training: Submit evidence that the foreman to be used on the job fulfills the qualifications detailed in this specification and has experience in similar jobs.
- 1.6.9 Medical Examinations: Submit evidence signed by a physician that each employee used on the job has received an appropriate medical examination as detailed in 29 CFR 1926.1101 and Cal-OSHA. The submitted document must be less than eleven months old.
- 1.6.10 Certificates of Compliance: Submit manufacturer's certification that vacuums, ventilation equipment, and other equipment required to contain airborne asbestos fibers conform to ANSI Z9.2.
- 1.6.11 Lead Waste: Lead-containing waste must be tested (TTLC/STLC/TCLP) and categorized for purposes of disposal. The Contractor shall submit written evidence of approved testing (including sample chain-of-custody forms) and disposal of lead wastes within five (5) days following the completion of each phase of the project.
- 1.6.12 Submit written evidence that the landfill for disposal is approved for asbestos disposal by the USEPA and state or local regulatory agency(s). Submit uniform hazardous waste manifests prepared, signed, and dated by an agent of the landfill. The manifest must certify the quantities of asbestos materials delivered to the landfill. The manifest must be provided to the Environmental Consultant within ten working days after delivery.
- 1.6.13 Satisfactory proof that written notification has been provided to the EPA regional office with jurisdiction over the project area, in accordance with Title 40 CFR Part 61 Subparts A & M, National Emission Standards for Hazardous Air Pollutants, U.S. EPA. Such notification shall include a request for variance if dry removal needs to be performed around active electrical equipment.
- 1.6.14 Licenses: Submit copies of state and local licenses, evidence of Cal-OSHA certification and permits necessary to carry out the work of this contract.
- 1.6.15 Notification of Other Contractors: If other contractors are working at the job site, the Contractor must inform all other contractors in writing before beginning any work. The Contractor must provide copies to the Environmental Consultant about the location, nature, and requirements on the asbestos work area according to 29 CFR 1926.1101 and Cal-OSHA.
- 1.6.16 Material Safety Data Sheets/Specification Sheets: The Contractor shall submit Material Safety Data and Specification Sheets for all chemicals, encapsulants, etc. to be used for this project.
- 1.6.17 Proof of environmental pollution insurance.

- 1.6.18 Rental Equipment: When rental equipment is to be used in the abatement areas or to transport hazardous waste, the Contractor shall provide written notification regarding intended use of the rental equipment to the rental agency before use, with copies to the Environmental Consultant and the Owner's representative.
- 1.6.19 Diagram of the setup of the work area showing all entrances to containment, decontamination systems, waste bag-out areas, negative air exhausts, location of exhaust ducting as needed, fire extinguisher placement, and emergency exits. Such diagram shall be approved in writing by the Owner's representative.
- 1.6.20 All lead abatement workers must have baseline and post-abatement blood lead level screenings. The blood tests will also be required at the end of each 30 days. Medical removal will be triggered at any time the worker's blood lead level (BLL) is measured at or above 50 micrograms per deciliter ( $\mu\text{g}/\text{dl}$ ). Cal-OSHA Title 8 CCR § 1532.1 – Lead in Construction. The Contractor shall be responsible for medical surveillance and record-keeping.
- 1.6.21 Submittals at the Completion of the Project:  
Upon completion of on-site work, Contractor shall provide a detailed project summary that will include each of the items listed below. The project Summary shall be submitted and approved by the Owner's representative prior to acceptance of final pay request and shall include the following:
- Contractor to submit copies of the Security and Safety Logs showing names of persons entering the workspace. The logs shall include date and time of entry and exit, supervisor's record of any accident (detailed description of accident).
  - Emergency evacuations and any other safety or health incident.
  - Waste manifests.
  - Personal air sample results.
  - Pressure differential strip chart readings for each differential recording device.
  - Project Summary.
    - a. Abatement contractor's name and address, certification number (CSLB) registration number (DOSH), and Tax ID.
    - b. Hazardous waste hauler (DPH, DOT).
    - c. Name, address, and registration number of hazardous waste hauler.
    - d. Laboratories performing analysis (NIST/NVLAP).
    - e. Contract number and name of project.
    - f. Specific inventory (including exact locations) of the hazardous materials which were removed or handled. Using a tabular format, provide for each TYPE hazardous material, and approximate quantity.
    - g. Number of employees working on the project.
    - h. Date of commencement of on-site work.
    - i. Date of completion of all on-site work.
    - j. Work method applied, i.e., glove bag, mini-enclosure, full containment with negative air, decontamination, etc.
    - k. Name, location, telephone number, and EPA registration of waste disposal site used.

## 1.7 MONITORING TECHNICIAN

- 1.7.1 The Environmental Consultant will act as the Owner's liaison in technical matters involving the asbestos and lead removal and disposal work.
- 1.7.2 The Environmental Consultant will only review submittals for general conformance with the abatement concept and general compliance with the information provided in the Bid Documents. Any action indicated during submittal review is subject to the requirements of the Specifications. **The Contractor shall be responsible for determining their own dimensions and quantities of ACMs/ACCMs/LBP/LCP that shall be confirmed at the job site. Reliance on the quantities provided in the assessment report and this specification is at the contractor's risk and their bid will be disqualified.**
- 1.7.3 The designated site representative of the Environmental Consultant is authorized by the Owner to have free access to all work areas, to assist in interpretation of procedures, and to advice on all provisions of the contract documents pertaining to the control of asbestos-containing materials.
- 1.7.4 The Environmental Consultant will advise the Owner to stop the Contractor's work if, while performing monitoring duties, the Consultant observes an instance of substantial non-conformance with the contract documents and/or situations presenting health hazards to workers or the building's employees. Work shall not resume until the corrective measures have been enforced. Instances of substantial non-conformance shall include, but not be limited to, the following:
  - Loss of negative pressurization,
  - Activities or misconduct imperiling worker's or building occupant's safety,
  - Breaches in containment resulting in potential release of asbestos to non-work areas.
- 1.7.5 All abatement work shall be conducted using good work practices to prevent the release of fibers or dust outside the work area. If poor work practices are observed, the Environmental Consultant shall direct the Contractor to make the necessary corrections. Generally, airborne fiber concentrations measured by PCM inside the containment area exceeding 0.1 fibers per cubic centimeter of air (fiber/cc) will be viewed as an indication of poor work practices unless the concentration is a direct result of design or external circumstances anticipated in the project specification.
- 1.7.6 If appropriate conditions are not made after two (2) warnings, or if an immediate threat exist which asbestos fibers could be released outside the work area, all abatement work will be stopped. The decision to stop work shall be made jointly by the Environmental Consultant and the Owner.
- 1.7.7 The Environmental Consultant may perform baseline air sampling in work areas of the subject building before the start of abatement work to establish the background total asbestos fiber concentrations.
- 1.7.8 The Environmental Consultant may also collect baseline lead wipe samples in areas of the building where lead abatement work is required.

- 1.7.9 The background total fiber concentration (or a total fiber concentration greater than 0.01 (f/cc) shall not be exceeded outside the work area during abatement work. If the total fiber concentration exceeds either background or 0.01 (f/cc) the Environmental Consultant is authorized to act in accordance with the above provisions to stop work. The Contractor shall perform all necessary corrective actions to reduce the fiber concentrations.
- 1.7.10 The Environmental Consultant may perform air sampling inside and outside the work areas during all phases of the work. The Contractor shall cooperate fully with the Consultant and ensure the cooperation of his workers during collection of air samples and work area inspections.
- 1.7.11 When visual inspections or air monitoring are specified, the Contractor shall notify the Owner and the Environmental Consultant in writing 24 hours in advance of the day and time when the Contractor will be ready for such inspections or monitoring. Such requests shall be initiated by the Contractor's Quality Control representative indicating that the area has been previously inspected and is ready for inspection/testing.
- 1.7.12 The Environmental Consultant's role in advising the Owner regarding environmental health matters does not relieve the Contractor's obligation to comply with all applicable health and safety regulations promulgated by the federal, state, or local governments. Air monitoring results generated by the Environmental Consultant shall not be used by the Contractor to represent compliance with regulator agency requirements for monitoring of workers exposure to airborne asbestos, nor shall any other activity on the part of the Environmental Consultant represent the Contractor's compliance with applicable health and safety regulations.

## **1.8 PROJECT MEETINGS**

- 1.8.1 Per the Owner request, the Contractor must attend pre-bid conference and job walk if any. Owner reserves the right to exclude any bidder not attending mandatory pre-bid conference and job walk.
- 1.8.2 Attend a pre-construction meeting prior to start of the work to clarify construction contract administration procedures and address potential problems.
- 1.8.3 Attend progress meetings on a weekly basis, or as reasonably designated by Owner's representative, throughout the construction period to enable orderly review of the progress of the work as well as to provide for discussion and evaluation of problems encountered during construction activities if any.
- 1.8.4 Provide or designate only persons with authority to commit contractor, subcontractor, and suppliers to revisions, modifications, and solutions agreed upon, including financial responsibilities, to attend meetings.
- 1.8.5 Notify Owner's representative at least 24 hours in advance of progress meetings regarding items to be added to the agenda.
- 1.8.6 Owner's representative or designee will compile minutes of each progress meetings.

- 1.8.7 Contractor shall be represented at all meetings by at least one party with authorization to commit to fiscal and operational changes to the project work.

## **2.0 PRODUCTS**

### **2.1 SIGNS AND LABELS**

- 2.1.1 Provide labeling in accordance with U.S. EPA requirements. Provide the required signs, labels, warnings, or posted instructions for containers used to transport contaminated material to the landfill.
- 2.1.2 Location of Caution Signs and Labels: Provide bilingual caution signs at all approaches to work areas in languages used by the Contractor's employees. Locate signs at such a distance that personnel may read the sign and take the necessary protective steps required before entering the area. Provide labels and affix to all asbestos materials, scrap, waste, debris, and other products contaminated with asbestos.
- 2.1.3 Warning Sign Format: Vertical format conforming to 29 CFR 1926.1101:

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

- 2.1.4 Warning Label Format: Provide labels that comply with 29 CFR 1926.1101 of sufficient size to be clearly legible, displaying the following legend:

DANGER  
CONTAINS ASBESTOS FIBERS  
AVOID CREATING DUST  
CANCER AND LUNG DISEASE HAZARD

- 2.1.5 Warning Sign Format: Vertical format conforming to 29 CFR 1910.1025(m)(2)(i):

WARNING  
LEAD WORK AREA  
POISON  
NO SMOKING OR EATING

- 2.1.6 Wherever the treatment process is reasonably expected to impact any lead-containing substances:

- Post a sign 14" by 14" includes the phrase, "Caution Lead Hazard. Keep Out" in bold lettering at least 2 inches high.

- Posting shall be in English and Spanish, and in any language used by any of Contractor's employees as the primary language of communication.

## **2.2 ENCAPSULANTS**

- 2.2.1 Contractor is responsible for ensuring that all encapsulant(s) used are fully compatible with all replacement finishes.
- 2.2.2 Encapsulants shall be U.L. Listed, in full-scale E-119 fire test.
- 2.2.3 Average depth of penetration shall meet manufacturer's recommendations.
- 2.2.4 Dry mil thickness of bridging encapsulating systems (if used) shall be as indicated in the specific treatment instructions included in this specification, and as recommended by the manufacturer.
- 2.2.5 Performance Requirements: Classification - penetrating encapsulant; spray applied and brushable. Product shall be tested and listed by EPA and possess the following characteristics:
  - Impact Resistance- minimum 60 inch-lbs.
  - Fire hazard classification ratings:
    - Flame resistance/flame spread ~25 (ASTM E162)
    - Fire classification - UL Class A approved in the specific or similar assembly to its intended application.
    - Product shall be tested and rated nontoxic and non-irritating under the Federal Hazardous Substances Control Act and contain no methylene chloride.
    - Product shall have been successfully applied in similar applications.
    - Material shall be tinted sufficiently to provide a readable contrast to background color to which it is applied.
    - The Contractor is responsible for ensuring that all encapsulants used shall be compatible with all existing and intended finishes including flooring materials.

## **2.3 PLASTIC SHEETING**

- 2.3.1 Use fire-retardant (FR) polyethylene (poly)
  - Thickness - 6-mil, minimum, NO EXCEPTIONS.
  - Flame Resistance/Flame Spread Rate <25.
  - Conforms to NFPA #701 and tested in accordance with ASTM E-84.
- 2.3.2 Spray adhesive for sealing polyethylene to polyethylene shall contain no methylene chloride or methyl chloroform (1,1,1-trichloroethane) compounds.

## **2.4 TAPE**

Tape, 2” or wider, shall be capable of sealing joints of adjacent sheet of polyethylene and shall attach polyethylene sheet to finished or unfinished surfaces or similar materials. Tape shall be capable of adhering under dry and wet conditions, including use of amended water.

## **2.5 LIQUID FLOOR ADHESIVE REMOVER**

- 2.5.1 If used, liquid floor adhesive remover shall be a nonflammable material only, with a flash point above 140 °F.
- 2.5.2 Material shall be recommended by the manufacturer for the purpose of removing floor covering adhesive and shall be used according to manufacturer’s recommendations.
- 2.5.3 Provide odor isolation and control to prevent disruption of occupants of space adjacent to where liquid removers are being used. Product shall be tested and rated nontoxic and non-irritating under the Federal Hazardous Substances Control Act.

## **2.6 STRIP CHART RECORDER(S)**

- 2.6.1 Where interior work areas are required; each shall always have a minimum differential pressure of negative 0.02 inches water gage.
- 2.6.2 Multiple continuous circular chart recorder(s) shall be used to document the level of pressure difference between the containment space and all other spaces as deemed necessary by the Environmental Consultant. Defective or non-operating instrumentation may require temporary cessation of work until instrumentation is repaired or replaced.
- 2.6.3 Differential air pressure systems shall be in accordance with Appendix J of EPA’s “Guidance for Controlling Asbestos-Containing Materials in Buildings, EPA 560/5-85-024. The Differential pressure system shall be continuously monitored by the Contractor using a recording instrument connected to an appropriate strip chart recorder. The recording instrument shall be connected to an audible alarm that will activate at a pressure differential of -0.02 inches water gauge.
- 2.6.4 The strip chart recorder will be checked a minimum of two times per day by a person familiar with the operation. Each check shall be documented on the circular chart with a time and date notation and the initials of the person performing the check. A copy of the circular chart shall be submitted daily to the Consultant.
- 2.6.5 Air which is exhausted to maintain negative pressure shall be exhausted from the building at locations, approved by the Environmental Consultant. Exhausted air shall not be near or adjacent to other building intake vents or louvers or at entrances to buildings. The Contractor shall provide on-site leak testing (DOP testing) to document the effectiveness of the air filtration units. The test results shall be signed by the Contractor’s supervisor. Repeat testing if the unit or the air filtration units have been repaired or replaced.



## **2.7 VACUUM EQUIPMENT**

All vacuum equipment used in the work area shall use HEPA filtration systems and be of the wet-dry type. The Contractor shall provide on-site independent leak testing (DOP testing) to document the effectiveness of the HEPA vacuum equipment. The test results shall be signed by the Contractor's superintendent. Repeat testing if the vacuum units have been repaired or replaced.

## **2.8 LOCAL EXHAUST SYSTEM**

Sufficient High Efficiency Particulate Air (HEPA) ventilation units registered with the South Coast Air Quality Management District (SCAQMD) shall be used to maintain the negative pressure in each interior work area at -0.02 inches of water column. These exhaust systems shall be in accordance with ANSI, and the HEPA unit shall bear a UL 586 label. The ventilation system must be maintained continuously (24-hours per day, every day) throughout the duration of the project until visual and air clearances are completed. HEPA-filtered air necessary to maintain pressure differential shall be vented to non-contaminated areas outside the buildings. Other HEPA units shall operate within the enclosure to circulate air and control fiber counts. All HEPA units shall be fitted as follows:

- A two-stage pre-filter as follows: 100-micron low efficiency filter and a second stage medium pre-filter for particle sizes down to 5 microns,
- Lapse time meter showing accumulated hours of operation,
- Electrical interlock preventing the operation of the unit without a HEPA filter,
- Audible alarm and automatic shutdown system in the event of filter rupture or blockage of the discharge
- Warning lights which indicate the status of the HEPA unit,
- HEPA systems must provide sufficient exhaust air to maintain a negative pressure of 0.02 inches of water.

## **2.9 HOURS OF OPERATION FOR HEPA FILTRATION UNITS**

The ventilation system shall remain in operation 24 hours a day until the work area has passed the specified clearance criteria. HEPA filtered air necessary to maintain pressure differential shall be vented to non-contaminated areas outside the buildings. Other HEPA units shall operate within the enclosure to circulate air and control fiber counts.

## **2.10 RESERVE EQUIPMENT**

2.10.1 Contractor to have the following equipment on site: two reserves, functioning and DOP-tested HEPA Filter Vacuum Cleaning Units, two reserve and DOP-tested HEPA area filtration units, and sufficient polyethylene (poly), respirators, protective equipment, tape, tools, containments, etc.

2.10.2 Provide authorized visitors, Owner Consultants or other contractors requiring access to the work area with suitable protective clothing, headgear, eye protection, as described in this specification, whenever the visitor must enter the work area. The Contractor shall have available and always maintained a minimum of three (3) suits and other suitable protective equipment for this purpose. All protective equipment shall be new and for the exclusive use of visitors.

2.10.3 The Contractor shall document that trained each visitor has been trained and fit-tested prior to entering an abatement area.

## **2.11 TRANSPORTATION EQUIPMENT**

Transportation equipment, as required, shall be lockable and suitable for loading, temporary storage, transit and unloading of contaminated waste without exposure to persons or property. Any vehicle used to transport asbestos waste shall be properly registered with all applicable controlling agencies.

## **2.12 CONNECTIONS TO WATER SUPPLY**

2.12.1 Contractor shall assure that all connections to the site's water system shall include backflow protection. Valves shall be temperature and pressure rated for operation of the temperatures and pressures encountered. After use, connections and fittings shall be removed without damage or alteration to existing water piping and equipment. Leaking or dripping valves shall be piped to the nearest drain or located over an existing sink or grade where water shall not damage existing finishes or equipment.

2.12.2 Employ heavy-duty abrasion-resistant hoses with a pressure rating greater than the maximum pressure of the water distribution system in each work area. Provide fittings as required to allow for connection to existing wall hydrants or spouts.

## **2.13 WATER HEATER**

Provide water heater with drip pan. The hot water supply must be adequate to allow for 60 minutes of continuous usage while maintaining a water temperature of 110 F °. At minimum provide UL rated 40-gallon electric water heater to supply hot water for the decontamination unit shower. Drip pan shall be securely fastened to the water heater.

## **2.14 OTHER TOOLS AND EQUIPMENT**

2.14.1 The Contractor shall provide other suitable tools for the stripping, removal, and disposal activities. Tools shall include hand-held scrapers, plastic brushes, sponges, rounded edge shovels, brooms, polyethylene, carts, etc. All tools will be inspected for contamination by the Environmental Consultant prior to removal from the work area.

2.14.2 All other materials not specifically described but required shall be provided by the Contractor subject to the approval of the Environmental Consultant.

**2.14.3 Prohibited Equipment:** The following equipment is prohibited from use on this project unless accepted in writing by the Environmental Consultant.

- High- or low-pressure water blasting equipment for hosing of work areas.
- Vacuum-powered removal or collection equipment located outside the asbestos work area.
- Gasoline, propane, diesel, or other fuel powered equipment inside the building, unless previously approved in writing by the Owner and the Environmental Consultant.
- Equipment that creates excessive noise or vibration that would affect the safety of the building or generate complaints from neighboring building occupants. No equipment shall exceed an A-weighted sound level of 85 dB as measured at 3 ft. from the radiating source without written permission of the Environmental Consultant and/or Owner.
- Metal wire-brushes (may be acceptable in certain instances for removing flooring materials).
- Flammable solvents with a flash point below 140 degrees F or materials containing ethylene glycol ether, methylene chloride, ethyl chloroform (1,1,1-trichloroethane), or other hazardous substances.
- Non-fire-retardant polyethylene sheeting.
- Polyurethane spray foam for application in fire-rated assemblies, including but not limited to penetrations into stairwells, mechanical rooms, electrical closets, rated floor-to-floor assemblies, etc.

### **3.0 EXECUTION**

#### **3.1 INITIAL AREA ISOLATION**

- 3.1.1 Shut down and disconnect all electrical power, gas, sewage, water, phone lines, fire life safety lines and sprinkler systems to the work area so that there is no possibility of reactivation and electrical shock.
- 3.1.2 Provide all necessary connections for temporary utilities in the workplace during abatement. Temporary electrical power shall be according to OSHA and the National Electrical Code for Wet Environments.
- 3.1.3 As required, establish designated limits for the asbestos work area with continuous barriers. Use barrier tape (3-inch) with a pre-printed asbestos warning and caution tape. Provide signs around the perimeter of the work area according to EPA, OSHA, and Cal-OSHA requirements.

- 3.1.4 Contractor shall conform to the Owner's lockout requirements and always secure the work area. Area entrances and exits shall be secured by the Contractor during the abatement phase. Unauthorized visitors are strictly prohibited. Only the Contractor, Environmental Consultant, and Owners' representatives are permitted at the job site. Contractor shall ensure that all doors, gates, windows, and potential entrances to the work area are secured and locked at the end of each workday.
- 3.1.5 Contractor shall store all materials, equipment, and supplies for the project the in areas designated by the Owner.
- 3.1.6 Contractor shall provide temporary sanitary services of adequate capacity to handle the maximum estimated crew size. Contractor shall maintain the temporary facilities throughout the duration of the project.
- 3.1.7 The Environmental Consultant will inspect and approve all containment setups before any abatement is undertaken. If a containment area is breached (failure of polyethylene seals, visible dust emission, fiber counts above background level, etc.), the Contractor shall take immediate action to control the breach and clean the area to the satisfaction of the Environmental Consultant. Clearance for any contaminated areas will be determined by the Environmental Consultant and may include aggressive sampling and TEM clearance testing. The Contractor shall be responsible for all costs associated with the clean-up and testing (including costs associated with the Environmental Consultant) resulting from such contamination.
- 3.1.8 The Contractor shall be responsible for identifying all HVAC components (if applicable) that lead into or out of the work areas. All components shall be disconnected and sealed airtight for the duration of the abatement work. All openings which lead to the building exterior shall be sealed with two (2) layers of 6 mil polyethylene secured with duct tape.

## **3.2 CONTAINMENT SET-UP PROCEDURES**

- 3.2.1 Contractor shall construct critical barrier and negative pressure containments for the work areas.
- 3.2.2 Contractor shall provide easily accessible viewing ports from the clean area into each abatement area. Viewing ports must be a minimum of 18" x 18", clear-see-through plastic with no scratches, tape, or glue marks, to permit the inspector to view most of the work area.
- 3.2.3 Pressure differential recorders with strip charts are required to monitor the pressure differential in the work area. The recorders must be calibrated prior to arriving on site and shall be periodically recalibrated throughout the project. Recalibration shall be performed by a qualified technician following the procedures outlined by the manufacturers. The original strip charts or copies shall be provided to the Consultant upon request. Contractor shall be immediately notified of any variance in pressure that may result in asbestos fiber concentrations above the baseline in adjacent areas.

3.2.4 The work areas shall be placed under negative pressure as outlined in this specification throughout the abatement work period.

3.2.5 A three-chambered decontamination unit shall be required during the abatement work. The unit shall be located immediately outside the contained area. A prefabricated unit is acceptable. Chambers shall be arranged as follows: a clean/change room, a shower, and a dirty/change room.

- The clean/change room of the worker decontamination unit shall be of sufficient size to accommodate the work crew and their belongings. It shall include a respirator storage area and be fully equipped with reserve equipment and materials such as clean suits, towels, soap, tape, and respirator filters.
- Worker decontamination unit walls shall be a minimum of two layers of 6-mil fire retardant poly and floors shall be constructed with a minimum of two layers of fire-retardant poly. All entry and exit doorways shall consist of at least two sheets of overlapping, fire resistant poly. At no time shall the flapped doors be taped open to expedite material or personnel load-out.
- The worker shower shall be equipped with a UL rated; electric water heater capable of providing a continuous water at minimum of 85 degrees F temperature during worker showers. The load-out decontamination area shall be equipped with running water, and a drip pan with dimensions of at least 24 inches by 24 inches by 6 inches. Provide relief valve compatible with water heater operation. Drip pans shall consist of a 24-inch X 24-inch X 6-inch-deep pan. Drip pan shall be securely fastened to the water heater.
- All water from the shower and bag wash area shall be filtered to the technically feasible limit, but not more than five (5) microns before disposal. In addition, comply with all current local, state, and federal regulations relating to wastewater.

### **3.3 PERSONNEL PROTECTION**

#### **3.3.1 Inform Workers:**

All workers shall be informed of the hazards of asbestos and lead exposure. Workers shall also be instructed in the use and fitting of respirators, protective clothing, decontamination procedures, and all other aspects associated with abatement work.

#### **3.3.2 Personal Hygiene Practices:**

The Contractor shall enforce and follow good personal hygiene practices during the abatement of asbestos and lead-containing materials. These practices will include but not be limited to the following:

- No eating, drinking, smoking, or applying cosmetics in the work area. The Contractor shall provide a clean space, separated from the work area, for these activities.

- If air monitoring data gathered by the Environmental Consultant in areas adjacent to the work areas shows exposure to airborne asbestos, exceeds Cal-OSHA criteria, that area will become regulated, and workers must wear protective clothing and approved respirators and must have a shower facility provided to them.

### 3.3.3 Respirators:

Establish a respirator program as outlined by ANSI and required by OSHA 29 CFR 1926.1101 and 29 CFR 1910.1001. Select respirators from those approved by the National Institute for Occupational Safety and Health (NIOSH).

#### Respirators and Protective Equipment for Handling Asbestos:

- a) At minimum, provide each employee with the following respiratory protection and protective clothing for each work phase:
  - 1) Pre-cleaning, containment set-up, and containment removal work - NIOSH-approved, half-face respirators with HEPA cartridges.
  - 2) All interior asbestos abatement work NIOSH-approved, full-face powered air purifying respirators with HEPA cartridges.

### 3.3.6 Protective Clothing:

- Provide personnel exposed to asbestos fibers, and lead dust with disposable protective whole-body clothing, head coverings, gloves, and foot coverings. Provide disposable plastic or rubber gloves to protect hands. Cloth gloves may be worn inside the plastic or rubber gloves for comfort but shall not be used alone. Make sleeves secure at the wrists and make foot coverings secure at the ankles with tape. Ensure that all personnel entering and leaving the workspace follow this procedure. Suits shall be of adequate size to accommodate the largest employee. Foot covers may be part of the coveralls. Non-disposable footwear shall be left in the work area until it is disposed of at the completion of the job.
- Protective clothing will be worn inside the work area after the area passes pre-abatement inspection and shall remain in use until the area passes final clearance inspection.

### 3.3.7 Goggles:

Provide goggles to personnel engaged in asbestos and lead removal operations when half-face respirators are in use.

### 3.3.8 Shower Requirements:

Contractor shall assure that all certified employees and visitors use protective equipment and the shower facility following each entry into the containment area after the start of the hazardous materials abatement.

### **3.4 CONTAINMENT AND DECONTAMINATION AREAS/SYSTEMS**

- 3.4.1 Prior to each work shift and continuously throughout the project, each containment and decontamination enclosure shall be inspected and repaired as needed.
- 3.4.2 Ambient asbestos fiber levels outside each work area shall not exceed 0.01 f/cc (PCM) or 70 s/mm<sup>2</sup> (TEM) or baseline, whichever is less. If the asbestos fiber concentrations outside each work area should exceed those levels shown above, then abatement must stop, and operations be reviewed and modified until the fiber count can be reduced to within the acceptable limits.
- 3.4.3 The Owner has the option to collect ambient airborne lead levels during the lead-related activities. Contractor must take appropriate actions to reduce the airborne lead concentration below the Action Level (AL) limit of 30 µg/m<sup>3</sup> (8-hour Time weighted Average).

### **3.5 ASBESTOS REMOVAL**

- 3.5.1 Removal of vinyl sheet flooring and associated mastic:
- Clean and isolate the work area,
  - Wet the material with amended water solution using equipment capable of providing a fine spray mist, to reduce airborne fiber concentrations when the material is disturbed,
  - Remove the vinyl sheet flooring and associated mastic using hand tools, and place in 6-mil asbestos bags, while still moist,
  - Double bagging of waste material is required,
  - Upon removal of the materials, wet brush or clean by some equivalent method to remove all visible residue from substrate
  - Remove all bags and equipment from the work area
  - Use HEPA Vacuum to clean and remove and residue
- 3.5.2 Removal of black mastic around pipe:
- Clean and isolate the work area,
  - Wet the materials with amended water solution using equipment capable of providing a fine spray mist, to reduce airborne fiber concentrations when the material is disturbed,
  - Remove the black mastic using hand tools, and place in 6-mil asbestos bags, while still moist,
  - Double bagging of waste material is required,
  - Upon removal of the materials, wet brush or clean by some equivalent method to remove all visible residue from substrate
  - Remove all bags and equipment from the work area
  - Use HEPA vacuum to clean and remove any residue

### 3.5.3 Removal of gasket:

- Clean and isolate the work area,
- Wet the materials with amended water solution using equipment capable of providing a fine spray mist, to reduce airborne fiber concentrations when the material is disturbed,
- Remove gasket using hand tools, and place in 6-mil asbestos bags, while still moist,
- Double bagging of waste material is required,
- Upon removal of the materials, wet brush or clean by some equivalent method to remove all visible residue from substrate
- Remove all bags and equipment from the work area
- Use HEPA vacuum to clean and remove any residue

### 3.5.4 Removal of exterior stucco (ACCMs):

- Clean and isolate the work area,
- Use wet method to remove the stucco
- Wet the material with amended water solution using equipment capable of providing a fine spray mist, to reduce airborne fiber concentrations when the material is disturbed,
- Use HEPA Vacuum to clean and remove and residue

## 3.6 LEAD REMOVAL

3.6.1 Building components such as metal handrail and wood door jambs are painted with LBP. In addition, exterior and interior components throughout the subject buildings are painted with LCP. All lead paint removal shall be conducted within a regulated area in a manner which does not result in contamination of non-work areas with lead-contaminated dust/debris. Containments shall be in accordance with the procedures specified in California Department Health Services Title 17, CCR 8, Division 1, Chapter 8 which references Chapters 11 and 12 of “Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing”, U.S. Department of Housing and Urban Development, June 1995. All paint removal shall be completed in accordance with all Federal, State, and Local regulations pertaining to storage, transportation, and disposal, construction, safety and health or other certifications, licenses, notifications, permits, and training. Also, comply fully with this specification and regulations that define the most stringent standards.

3.6.2 If the Contractor’s work practices cause a release of lead paint chips or dust from the work area as determined by the Environmental Consultant, then additional engineering controls must be implemented. The construction of additional containments shall be at no additional cost to the Owner.

3.6.3 Paint removal work must be conducted by workers trained in accordance with the California Department of Public Health (CDPH). Lead standard Title 8 Section 1532.1.

3.6.4 All lead removal shall be conducted using good work practices to prevent the release of dust, debris, or run-off outside the work area. If poor work practices are observed, the Owner’s site representative shall direct the Contractor to make the necessary corrections.



- 3.6.5 All workers must decontaminate before leaving the work area. The Contractor shall enforce and follow good personal hygiene practices during the removal of lead-containing paint. These practices will include but not be limited to the following: No eating, drinking, smoking, or applying cosmetics in the work area. The Contractor will provide a clean space separated from the work area for these activities.
- 3.6.6 The contractor is responsible for proper statistical waste stream categorization, manifesting and disposal of lead-containing paint (or recycling) as required by USEPA and applicable Federal, State and Local regulations. The owner, at its option may collect duplicate waste stream samples to verify the statistical methods used by the Contractor. In the event of conflict, the Owner's results will prevail. The Contractor at no additional expense to the Owner will appropriately dispose of the waste.
- 3.6.7 Lead-containing debris and contaminated water shall be cleaned from the work area at the end of each work shift. Contractor shall clean the work area using wet methods and HEPA vacuuming equipment.

### **3.7 AIR MONITORING**

- 3.7.1 The purpose of the air monitoring conducted by the Owner will be to detect possible release of asbestos fibers or airborne particulate migrating from the work area.
- 3.7.2 All PCM air sample analysis shall comply with NIOSH Method 7400. If necessary, all TEM analysis shall be consistent with AHERA protocol.
- 3.7.3 All lead air sampling, if necessary, shall comply with NIOSH 7082 and NIOSH 7300 method.
- 3.7.4 The Consultant shall perform all final visual inspections, air clearance, and sampling consistent with AHERA protocols.
- 3.7.5 The method of analysis for pre-abatement and clearance air samples shall be via PCM and/or TEM. The method of analysis for in-progress asbestos air samples shall be PCM and TEM at the option of the Owner.
- 3.7.6 The Contractor shall be responsible for all personal air sampling. During the performance of any work in the contaminated work area, sufficient personnel breathing zone samples shall be taken to constitute representative sampling. These samples shall be taken each shift and for each distinct crew operation and shall be used to verify adequacy of fiber control and respiratory protection. Personal breathing zone air sampling shall be in accordance with CAL/OSHA standards.

### **3.8 DECONTAMINATION**

Asbestos and Lead Decontamination:

- Following the abatement work, all reusable, contaminated equipment, such as masks, hard hats, etc. shall be thoroughly decontaminated through wet cleaning methods before removal from the work area.
- No accumulation of debris or standing water will be permitted following the initial decontamination.

### **3.9 CLEARANCE INSPECTION**

- 3.9.1 Initial Visual Inspection: Contractor shall notify the Owner's representative/onsite consultant when the decontamination process in each containment area is complete. Evidence of asbestos dust will require additional clean up by the Contractor. Contractor shall be responsible for re-cleaning all areas found to be deficient.
- 3.9.2 Once the initial visual is passed, the Contractor shall remove all but the containment critical barriers and decontamination unit.
- 3.9.3 If the Owner determines that the work area is sufficiently clean, the Contractor may proceed with encapsulation. If the Owner determines that certain areas require additional cleaning, the Contractor shall re-clean the work area and request a second inspection of the recleaned area. All costs incurred by the Owner for inspections required after the second inspection will be charged to the Contractor.
- 3.9.4 Following the second visual inspection, the Contractor shall provide a coating of non-diluted encapsulant to all surfaces in the work area. The Contractor shall allow the encapsulant to dry for the period specified by the manufacturer. The Contractor is responsible for confirming compatibility of encapsulant with new paints/surfacing materials to be applied.
- 3.9.5 Asbestos Clearance Testing:  
Following encapsulation and drying time, the Contractor shall request that the Environmental Consultant conduct air clearance sampling. Clearance air sampling shall not take place until all encapsulant is dry.
- 3.9.6 Lead Clearance Testing:  
After removal of polyethylene sheeting, the Owner will conduct a final visual inspection of each work area. Any lead material found shall be cleaned by the Contractor and any repairs to existing conditions shall be made at no cost to the Owner. The Owner has the option to collect wipe samples for lead content analyses.

### **3.10 ASBESTOS CLEARANCE CRITERIA**

- 3.10.1 After removal of remaining barriers, the Environmental Consultant may conduct a final inspection of each work area. Any material found shall be cleaned by the Contractor and any repairs to existing conditions shall be made at no additional cost to the Owner. When the area is clean, the Environmental Consultant shall provide the Contractor with a written notice of acceptance.
- 3.10.2 The clearance level inside containment shall be less than 0.01 fibers per cubic centimeter via phase contrast microscopy (PCM) or less than 70 structures per square millimeter ( $\text{mm}^2$ ) via transmission electron microscopy (TEM). Sampling shall be performed in accordance with AHERA protocols.
- 3.10.3 Multiple samples will be collected. If one (1) sample exceeds the criteria of 0.01 fibers per cubic centimeters (f/cc) of air then the entire area fails, and the contractor must re-clean the area.
- 3.10.4 If air samples do not pass the required clearance criteria, the area shall be re-cleaned, and new samples shall be collected by the Environmental Consultant. The Contractor shall be responsible for all costs associated with re-sampling and re-analyses.
- 3.10.5 The Environmental Consultant shall notify the Contractor in writing of acceptable asbestos fiber concentrations. The Contractor shall then remove all the remaining barriers in the work area.

### **3.11 LEAD CLEARANCE CRITERIA**

- 3.11.1 At the option of the Owner/Environmental Consultant, lead dust wipe samples may be collected following the abatement work. If one (1) sample exceeds the criteria of 10 micrograms per square foot ( $\mu\text{g}/\text{ft}^2$ ) for floor then the entire floor area fails, and the Contractor must re-clean the area.
- 3.11.2 The contractor shall be responsible for all costs associated with re-cleaning and Sampling, of failed work areas including all costs associated with the Environmental Consultant.

### **3.12 HAZARDOUS MATERIALS DISPOSAL**

- 3.12.1 Load-Out Procedures:
  - Ensure that polyethylene bags are sealed airtight. All bags shall be wet cleaned prior to removing them from the equipment decontamination unit.
  - Ensure all disposal containers are properly labeled according to 8 CCR 1529, 5194 (HAZCOM), 49 CFR 171-179 (USDOT), 40 CFR 61 Subpart M (NESHAP), and any local regulations and state regulations as required by this specification.

### 3.12.2 Disposal Procedures:

- It is the responsibility of the Contractor to determine current waste handling, labeling, transportation, and disposal regulations for the work site and for each waste disposal landfill. The Contractor must comply fully with these regulations, federal, state, and local regulations and provide documentation of the same.
- Filter all wastewater to the technically feasible limit, but not more than five (5) microns before disposal. Comply with all current local, state, and federal codes relating to wastewater release.
- Asbestos-containing waste that is properly labeled and double-bagged may be temporarily stored in unoccupied areas approved by the Owner. Rooms must be made secure before storing the waste. Waste is not to remain in temporary storage area for longer than five (5) days before final load-out of materials.
- All asbestos waste shall be double wrapped prior to transport from the work area.
- The contractor shall manage lead waste streams and perform all appropriate waste stream testing as required by the appropriate regulations and selected landfill.
- All vehicles used to transport waste must be registered with the Department of Toxic Substance Control and display the proper registration and expiration stickers.
- Trucks must have an enclosed cargo area with a storage compartment that is fully lined with a minimum of one (1) layer of 6-mil polyethylene on the walls and two (2) layers on the floor.
- Contractor shall not throw bags into the truck.
- Contractor shall provide at minimum one (1) day advance notification to the Owner when signatures are required on manifests. The Contractor shall ensure that the Hazardous Waste Manifest is correctly filled out. The Contractor shall give the appropriate copies to the Owner.
- The Contractor shall make all necessary arrangement with the Owner including obtaining all appropriate permits.
- Contractor is responsible for all coordination with the waste disposal site and with the waste hauling company.
- Enclosed bin for hazardous waste shall be fully lined with a double layer of polyethylene sheeting.
- The Contractor must transport the waste bin off the job site.
- Disposal shall be in a landfill that meets EPA requirements and is approved by the Owner. Do not throw bags into landfills in a way that may cause the bags to burst open. If bags cannot be taken out of the drums undamaged, then include the disposal of the drums with the bags. Ensure that bags remain intact during this process.