

**MANZANITA ROOM
CITY OF LAFAYETTE COMMUNITY CENTER
500 SAINT MARY'S ROAD
LAFAYETTE, CA 94549**

PROJECT NO. 012-9174

DOCUMENT 00 91 13

ADDENDUM NO. 10

The following clarifications, additions, and deletions shall become a part of the plans and specifications for the above project, and shall be bound by the General Conditions, Technical Specifications, and all other conditions of the Bid Documents.

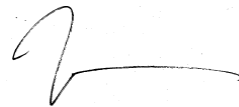
PROJECT MANUAL

1. Section 02 41 16.12, "Hazardous Materials Abatement," is hereby reissued with minor revisions and deletions to clarify the requirements as they apply to hazardous materials found. Language shown in strike-out is hereby deleted from the subject section. Additions and revisions, shown in underlined italics, are hereby incorporated into the subject section.

There is no change to laboratory reports previously issued.

2. In re-issuing the above Section 02 41 16.12, City has determined that it does not represent a material change to the scope of overall Project Work, or the content, form, or manner of the overall Bid to be submitted. As such, the bid date and time are not extended as a result of this action.

CITY OF LAFAYETTE



Date: October 7, 2014

By: Tony Coe, City Engineer

**MANZANITA ROOM
CITY OF LAFAYETTE COMMUNITY CENTER
500 SAINT MARY'S ROAD
LAFAYETTE, CA 94549**

SECTION 02 41 16.12

HAZARDOUS MATERIALS ABATEMENT

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. The general conditions of the Contract shall apply.

1.2 COMPLIANCE AND INTENT

- A. Abatement work described herein includes the removal of hazardous materials from the existing building prior to demolition. Contractor shall coordinate all abatement work in accordance with these specifications.
- B. Abatement shall include the handling, removal, and proper disposal of hazardous materials including, but not limited to, asbestos-containing and lead-containing materials. All hazardous materials shall be removed and disposed of according to all federal, state and local regulations. The Contractor shall determine if additional hazardous materials will be impacted by the scope of the abatement work. The cleanup of any incidental asbestos and lead found in areas undergoing abatement of asbestos and lead containing materials that become separated from the buildings during the dismantling process are part of the hazardous materials work.
- C. Contractor shall obtain and furnish all labor, materials, facilities, equipment, services, employee training, medical monitoring, permits and agreements necessary to perform the work required for hazardous materials abatement in accordance with these specifications. By entering into Contract to perform Work for this Project, Contractor presents himself as being knowledgeable of all federal, state, and local regulations that govern the abatement work, including removal, storage, transportation, and disposal, employee health and safety, training, certification, and permits. Nothing in these Specifications shall be construed as relieving Contractor of his responsibility to fully comply with said regulations, which shall be considered as part of Contract Work. Where there is a conflict between said regulations and the Contract Documents, the stricter provisions shall apply. Contractor shall perform all work with competent persons who are trained, knowledgeable, and qualified in state-of-the-art techniques relating to hazardous materials abatement, handling, and the subsequent cleaning of contaminated areas.
- D. The work of this section shall be performed by an entity that holds a current, valid asbestos handling license issued by the California State Contractor's Licensing Board (SCLB) 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), unless other specified. Display copies of CSLB license and Cal-OSHA Certificates in a visible place at the job-site.
- E. The abatement workers shall have received EPA-accredited training and be certified for asbestos abatement and DHS Lead worker certified. Demolition of painted surfaces with lead-containing paint shall be performed by workers trained in accordance with DOSH's lead construction standard, Title 8 CCR 1532.1. During all work, Contractor shall

provide monitoring and worker protective equipment in accord with the California Occupational Safety and Health Administration (Cal-OSHA) and as required by these specifications.

- F. Work on the premises shall be confined to areas designated in the Contract Documents. Materials and equipment shall be stored within areas designated by the Engineer. Should additional space be required, the Contractor shall request permission for additional space and shall adequately safeguard occupants from associated health and safety hazards.
- G. Contractor shall perform appropriate Total Threshold Limit Concentration (TTLC), Soluble Threshold Limit Concentration (STLC) and Toxicity Characteristic Leaching Procedure (TCLP) testing for lead-contaminated waste as required by these specifications, by law, and by the selected landfill(s). All testing shall be done in the presence of the City's Environmental Consultant. Chain-of-custody forms shall be provided to the Engineer and the Environmental Consultant within one (1) day following sample delivery to the laboratory.
- H. During removal activities, the Contractor shall protect against contamination of soil, water, plant life, and adjacent building areas, and shall ensure that there is no airborne release of hazardous materials and dusts. The Engineer may collect air and wipe samples in the building and in adjacent areas to evaluate the Contractor's performance. Evidence of settled dust or airborne levels of contaminants above background shall require the implementation of additional controls at no increase to the Contract Price.
- I. It is the Contractor's responsibility to determine the quantities of hazardous materials impacted by the demolition work. The Contractor shall conduct a site visit to determine exact locations of materials impacted by the demolition work. If additional suspect hazardous materials are discovered during the course of the abatement work, Contractor shall immediately notify the Engineer.
- J. Hazardous materials 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 Engineer thereby limiting the City'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 Engineer shall approve the non-asbestos-containing hazardous waste disposal site(s) prior to disposal of materials that may be disposed of in that manner.
- K. All interior asbestos abatement work shall be conducted using a negative pressure enclosure and three stage decontamination units unless otherwise specified. The removal of asbestos-containing roofing materials shall be removed using wet methods and allowing no visible emissions. Evidence of the release of asbestos above the background level will necessitate additional controls including but not limited to an enclosure.

1.3 SCOPE OF WORK

- A. The scope of work consists of the removal of the following asbestos-containing and lead- containing materials, impacted by the demolition.
- B. ASBESTOS-CONTAINING MATERIALS (ACMs)
 - 1. The following asbestos containing materials must be abated prior to demolition. The laboratory reports attached to these specifications contain descriptions of samples and locations where they are taken. The Contractor shall be

responsible for field verifying quantities of ACMs and abating them wherever they occur in accordance with these specifications.

MATERIAL	GENERAL LOCATION	PERCENT ASBESTOS
Tan vinyl floor tile with black mastic located under top layer of wood-patterned press-on vinyl flooring	Main room (Floor area approximately 5,700 square feet)	Tile: 3% CH Mastic: ND
Off-white window caulk	Main room windows	2% CH
Grey patch on roof penetrations and gutter	Main roof	4% CH

CH – chrysotile; ND – none detected

NOTE: Asbestos results are by polarized light microscopy (PLM) analysis unless specifically stated to be by point count method.

- ~~2. The materials can be disposed of as Category I Non friable ACMs if they are not rendered friable during removal.~~

C. LEAD-CONTAINING MATERIALS:

1. Contractor shall assume that all interior and exterior painted surfaces of the building, except for the off-white paint on the interior walls of the main room, contain detectable concentrations of lead. Contractor shall remove all loose and peeling paint from the building's substrate prior to demolition of such surfaces.
2. The Contractor is responsible for proper handling, personnel monitoring, personnel protection, and disposal of lead paint and ~~ceramic tile~~ related construction debris. It is the Contractor's responsibility to determine the required testing protocols for lead-containing materials prior to disposal.
3. Contractor shall conduct personal monitoring and provide workers with appropriate personal protective equipment if necessary. All work shall be conducted in a manner that does not release lead dust to the surrounding areas.

1.4 DEFINITIONS

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

Abatement - Lead: Process of removal, clean up and disposal of lead from building surfaces as required for demolition or renovation work.

ACM: Asbestos-containing material

Action Level - Lead: Employee exposure without regard to the use of respirators, to an airborne concentration of 30 micrograms per cubic meter of air ($30 \mu\text{g}/\text{m}^3$) calculated as an 8-hour time-weighted average (TWA).

Activity Class/Category - Lead: The designation assigned to work activities specified for removal of lead 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 or gasketed 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 maintained in uncontaminated condition at all times.

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

Area Monitoring: Sampling of airborne asbestos fiber concentrations and/or airborne lead 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-Containing Material (ACM): Those manufactured products and construction materials including structural and mechanical building materials, as well as packings and gaskets that contain more than one percent (1.0 %) asbestos by weight.

Asbestos: Asbestos includes asbestiform varieties of serpentinite (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 City 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.

Baseline: Refers to the background levels of asbestos and lead monitored before abatement.

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

Breach: 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 arm 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/samples 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.

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

Competent Person: One who is capable of identifying existing and predictable lead and asbestos hazards and who has the authority to take prompt corrective measures to eliminate them.

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 and lead contamination upon concluding work activities that result in exposure to these hazardous materials.

DHS: State Department of Health Services

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 (Also see Cal-OSHA)

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

Demolition: The wrecking or taking out of any load-supporting structural member of a facility together with any related handling operations or the intentional burning of any facility.

Disposal Bag: Minimum six (6) mil thick leak-tight plastic bags used for transporting asbestos waste from a work area to disposal or shipping container. Each disposal bag must have required labels according to 8 CCR 1529 (Cal-OSHA asbestos rule), 5194 (HAZCOM). RACM waste must be additionally labeled according to 49 CFR 171-179 (USDOT), and 40 CFR 61 Subpart M (NESHAP). Hazardous waste disposal bags must be labeled with generator's name, address, site location and generator number as well as the following information.

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 LAWS 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 into the material and binding its components together (penetrating encapsulant).

Encapsulation: A specified procedure necessary to coat asbestos-containing material or asbestos contaminated surfaces 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 City.

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 kept clean from asbestos-containing debris at all times.

Excursion Limit: A California Code of Regulations (8 CCR 1529) requirement that ensures no employee is exposed to airborne concentration of asbestos in excess of 1.0 fiber 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 airborne particulate 0.3 microns or greater in diameter at 99.97 percent efficiency.

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 typically fulfills the duties of "competent person" as defined in Title 8 CCR 1529. This individual must supply documentation of a passing grade in an EPA accredited course in Practices and Procedures in Asbestos Control. The foreman must be on-site during all abatement work.

Glove bag: A polyethylene bag with two inward projecting long sleeve gloves, designed to enclose an object from which an asbestos-containing material is to be removed. Bags shall be seamless at the bottom, have a minimum thickness of 6 mil, and shall be labeled appropriately.

Glove bag Technique: A method for removing ACM from heating, ventilating, 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.

HEPA Filter Equipment: High efficiency particulate air filtered vacuuming equipment with a filter system capable of collecting and retaining asbestos fibers. Filters shall be 99.97 percent efficient at retaining fibers of 0.3 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.

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: Paint, sludge, debris or cleaning materials 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 Toxicity Characteristic Leaching Procedure (TCLP) test. The waste will also be classified as hazardous waste if the Total Threshold Limit Concentration (TTLC) of measured lead is greater than 350 mg/kg or if the Soluble Threshold Limit Concentration (STLC) of measured lead is greater than or equal to 5 mg/l.

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 certifies 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.

Permissible Exposure Limits (PELs) - Asbestos: A level of airborne fibers specified by OSHA as an occupational exposure standard for asbestos. Represents the 8-hour time weighted average of 0.1 total fibers per cubic centimeter and 30 minute excursion limit of 1.0 fiber per cubic as measured by phase contrast microscopy (PCM).

Permissible Exposure Level (PEL) - Lead: An eight-hour time weighted average concentration of 50 micrograms of lead per cubic meter of air (50 $\mu\text{g}/\text{m}^3$)

Personal Monitoring: Sampling for asbestos and lead 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 facepiece respirator that has the breathing air powered to the wearer after it has been purified through a 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 building materials.

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 atmospheres.

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 indicate 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 indicate Total Threshold Limit Concentration of measured lead are greater than or equal to 350 milligrams per kilogram (mg/kg).

Visible Emissions: Any emission containing particulate 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 lead or hazardous material work or removal is performed and that is defined or isolated to prevent the spread of lead or asbestos dust, fibers or debris, and entry by unauthorized personnel. Work area is a Regulated Area as defined by Title 8 CCR 1529.

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

1.5 REFERENCES

The publications listed below form a part of these specifications by reference. The publications are referred to in the text by basic designation only. If there is a conflict between any of the listed regulations or standards, then the most stringent or restrictive shall apply.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ANSI Z9.2	1979 (R 1991) Fundamentals Governing the Design and Operation of Local Exhaust Systems
ANSI Z88.2 1992	Respiratory Protection
ASTM C 732	1982 (R 1987) Aging Effects of Artificial Weathering on Latex Sealants
ASTM D 522	1993 (Rev. A) Mandrel Bend Test of Attached Organic Coatings
ASTM D 1331	Solutions of Surface-Active Agents
ASTM D 2794	1993 Resistance of Coatings to the Effects of Rapid Deformation (Impact)
ASTM E 84	1991 (Rev. A) Surface Burning Characteristics of Building Materials
ASTM E 96	1994 Water Vapor Transmission of Materials
ASTM E 119	1988 Fire Tests of Building Construction and Materials
ASTM E 736	1992 Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members
ASTM E 1368	1990 Visual Inspection of Asbestos Abatement Projects

CALIFORNIA ASSEMBLY BILLS (CAB)

CAB 040	Yearly Registration of Contractors
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CALIFORNIA CODE OF REGULATIONS (CCR)

Title 8 CCR 5208	General Industry - Asbestos
Title 17 Div. 1, Chap. 8	Accreditation, Certification, and Work Practices in Lead-Related Construction
CCR CARS	Carcinogen and Asbestos Registration Sections 340-344.53, 341.6 Amended, and 341.9 Amended Through 341.14
CCR CSO	Construction Safety Orders, Chapter 4, Subchapter 4
CCR ESO	Electrical Safety Orders, Chapter 4, Subchapter 5
CCR 1529	Asbestos Construction Standard
CCR 1532.1	Lead in Construction
CCR 3203	Accident Prevention Program
CCR 3204	Access to Employee Exposure and Medical Records
CCR 3220	Emergency Action Plan
CCR 3221	Fire Prevention Plan
CCR 5144	Respiratory Protection Equipment Standard
CCR 5194	Hazard Communication Standard
CCR 5209	Carcinogen Regulation
CCR 6003	Accident Prevention Signs

CALIFORNIA HEALTH SERVICES (CHS) TITLES 22 AND 23, CALIFORNIA ADMINISTRATIVE CODE DISPOSAL REQUIREMENTS

CHS 25123	Section 25123
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CHS 25124	Section 25124
CHS 25143	Section 25143
CHS 25163	Section 25163
CHS 66508	Section 66508
CHS 66510	Section 66510
CHS DIV 4	Division 4, Commencing with Section 66000, "Disposal"

CALIFORNIA HEALTH AND SAFETY CODE (CHSC)

CHSC 20	Division 20, Commencing with Section 24200
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CALIFORNIA LABOR CODE (CLC)

CLC DIVISION 5	Part 1, commencing with 6300
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CALIFORNIA PROPOSITIONS (CP)

CP 65	Proposition 65
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CALIFORNIA STATE BOARD OF EQUALIZATION (CSBE)

CSBE ETU	Excise Tax Unit
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CALIFORNIA STATE LICENSE BOARD (CSLB)

CSLB CBPC	California Business and Professional Code Sections 7058.5 and 7058.7, "Certification"
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CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1910.134	Respiratory Protection
29 CFR 1910.141	Sanitation
29 CFR 1910.145	Accident Prevention Signs and Tags
29 CFR 1926.21	Safety Training and Education
29 CFR 1926.55	Gases, Vapors, Fumes, Dusts, and Mists
29 CFR 1926.62	Lead Exposure in Construction
29 CFR 1926.65	Hazardous Waste Operations and Emergency Response
29 CFR 1926.103	Respiratory Protection
29 CFR 1926.59	Hazard Communication
29CFR 1910.1000	Air Contaminants
29 CFR 1926.1101	Asbestos
40 CFR 61-SUBPART A	General Provisions
40 CFR 61-SUBPART M	National Emission Standard for Asbestos
49 CFR 172	Hazardous Materials Tables and Hazardous Materials Communications Regulations
40 CFR 260	Hazardous Waste Management Systems: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Generators of Hazardous Waste
40 CFR 263	Transporters of Hazardous Waste
40 CFR 264	Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standard for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 745	Lead; Requirements for Lead-Based Paint Activities

40 CFR 763
49 CFR 178

Asbestos Containing Material in Schools
Shipping Container Specifications

LOCAL REGULATIONS

Regulation 11, Rule 2

Bay Area Air Quality Management District

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)

Guidelines for the Evaluation and Control of Lead-Based
Paint Hazards in Housing

**UNDERWRITERS
LABORATORIES INC. (UL)**

1990 High-Efficiency Particulate Air

1.6 SUBMITTALS PRIOR TO PROJECT COMMENCEMENT

The following items shall be submitted to, and approved by, the Engineer before commencing work involving the hazardous materials outlined in these specifications.

- A. Detailed work plan that includes water and electrical power supply at the site; waste water discharge from showers and inside the work area; construction, location and number of containments and decontamination units. Schedule showing milestone dates for activities such as mobilization, work area preparation, ACM removal, ACM waste load-out, lead abatement and lead load-out, final clearance evaluations, completion dates. Contractor shall also submit variances received from regulatory agencies as applicable.
- B. Provide a safety plan prior to beginning Work. The site safety plan shall deal with the following, at a minimum:
 - 1. Personal protective equipment;
 - 2. Site safety and health hazards;
 - 3. Fiber release incidents;
 - 4. Control of water leakage or discharge within and/or from the work area;
 - 5. Medical emergency;
 - 6. Asbestos and lead handling procedures;
 - 7. Contractor's internal administrative and inspection procedures;
 - 8. Earthquakes and/or fire emergency procedures;
 - 9. Protocol for responding to complaints or questions from interested parties;
 - 10. 24-Hour emergency telephone numbers for Contractor's Company Officers with authority to respond to emergencies.
- C. Name of Competent Person (as defined by Title 8 CCR 1529): Demonstrate education and specialized training with successful completion of examination of an EPA approved asbestos and DHS accredited training courses.
- D. List of Workers: Demonstrate education and specialized training with successful completion of EPA approved and DHS accredited training courses.
- E. 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 and lead concerning health and respiratory equipment.
- F. Proof of Respirator Fit Testing: Provide proof of respirator fit testing. Fit testing records must be less than eleven (11) months old and document testing on the type of respiratory protective equipment used for this project. Fit testing records must be signed by the Competent Person.
- G. 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.

- H. Medical Examinations: Submit evidence signed by a physician that each employee used on the job has received an appropriate medical examination as detailed in Title 8 CCR 1529 and 1532.1. The submitted document must be less than eleven months old.
- I. Written Notification to Fire and Police Departments: Provide documentation showing notification to local fire and police departments of the abatement three (3) days before commencement of Work.
- J. 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.
- K. Hazardous Waste: Hazardous 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 hazardous wastes within five (5) days following the completion of each phase of the project.
- L. Submit written evidence that the landfill(s) for disposal are approved for asbestos, lead, mercury, and any other hazardous materials 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 amount of hazardous materials delivered to the landfill. The manifest must be provided to the Environmental Consultant within ten working days after delivery. If the mercury-containing light tubes will be recycled, submit written evidence that the facility is approved for this operation.
- M. Satisfactory proof that written notification has been provided to the Bay Area Air Quality Management District, in accordance with Regulation 11, Rule 2 and Title 40 CFR Part 61 Subparts A&M, National Emission Standards for hazardous Air Pollutant, U.S. EPA.
- N. Licenses: Submit copies of state and local licenses, evidence of Cal-OSHA registration and permits necessary to carry out the work of this contract.
- O. Notification of Other Contractors: If other contractors are working at the job site, before beginning any work the Contractor must inform all other contractors in writing. The Contractor must provide copies to the Environmental Consultant about the location, nature, and requirements of the work areas.
- P. 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.
- Q. 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 Engineer.

1.7 SUBMITTALS AT THE COMPLETION OF THE PROJECT

- A. Upon completion of on-site abatement 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 Engineer prior to acceptance of final pay request and shall include the following:
 1. 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),

2. Emergency evacuations and any other safety or health incident
3. Waste manifests
4. Personal air sample results
5. Pressure differential strip chart readings for each differential recording device on the site.
6. Other information:
 - a. Abatement contractor's name and address, certification number (CSLB), registration number (DOSH), and Tax ID;
 - b. Hazardous waste hauler (DHS, DOT);
 - c. Name, address, and registration number of hazardous waste hauler;
 - d. Laboratory(ies) 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 abatement work;
 - i. Date of completion of all on-site abatement work;
 - j. Work method applied; i.e., glove bag, mini-enclosure, full containment with negative air, decon, etc;
 - k. Name, location, telephone number, and EPA registration of waste disposal site used.
 - l. DOP testing results.

1.8 OTHER RESPONSIBILITIES

- A. Contractor's submittals will be reviewed only for general conformance with the abatement concept and general compliance with the information provided in the Contract Documents. Any action indicated during submittal review is subject to the requirements of the Contract. The Contractor shall be responsible for dimensions and quantities that shall be confirmed at the job site.
- B. Contractor shall provide the Engineer or his designee free access to all hazardous materials work areas, to assist in interpretation of procedures, and to advise on all provisions of the Contract Documents pertaining to the control of hazardous materials.
- C. If, in the course of performing monitoring duties, the Engineer or his designee observes an instance of substantial non-conformance with the Contract Documents and/or situations presenting health hazards to workers, work shall stop and not resume until the corrective measures have been enforced. Instances of substantial non-conformance shall include, but not be limited to, the following:
 1. Loss of negative pressurization;
 2. Activities or misconduct imperiling worker's safety; and
 3. Breaches in containment resulting in potential release of asbestos and lead, to non-work areas.

- D. All hazardous materials 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 Contractor will be directed to make the necessary corrections. Generally, airborne fiber concentrations measured by PCM inside the containment area exceeding 0.2 fibers/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.
- E. If appropriate conditions are not made after two (2) warnings, or if an immediate threat exists that asbestos fibers and lead dust, could be released outside the work area, all abatement work will be stopped. The decision to stop work shall be made by the Engineer.
- F. The Agency's representative will perform baseline air sampling in selected work areas of the buildings before the start of abatement work to establish the background total asbestos fiber and lead dust concentrations.
- G. 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 work shall stop. The Contractor shall perform any and all necessary corrective actions to reduce the fiber concentrations.
- H. Daily lead air sample analysis must demonstrate an airborne lead concentration of less than 30 micrograms per cubic meter of air ($30 \mu\text{g}/\text{m}^3$) in areas inside the work area. The Contractor shall perform any and all necessary corrective actions to ensure that concentrations do not exceed this level. Airborne lead concentrations outside the work area shall not exceed background levels.
- I. The City's consultant may perform air sampling inside and outside the hazardous materials work area 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.
- J. When visual inspections or air monitoring are specified, the Contractor shall notify the Engineer 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 Competent Person or Foreman indicating that the zone has been previously inspected and is ready for inspection/testing.
- K. The City's observations and monitoring 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 City shall not be used by the Contractor to represent compliance with regulatory agency requirements for monitoring of workers exposure to airborne asbestos, nor shall any other activity on the part of the City or Engineer and their representatives represent the Contractor's compliance with applicable health and safety regulations.

PART 2 – PRODUCTS

2.1 SIGNS AND LABELS

- A. Provide labeling in accordance with U.S. EPA requirements. Provide the required signs, labels, warnings, or posted instructions for containers used to transport hazardous material to the landfill.

- B. 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 and lead-containing materials, scrap, waste, debris, and other products contaminated with hazardous materials.
- C. Warning Sign Format: Vertical format conforming to Title 8 CCR 1529:

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

- D. Warning Label Format: Provide labels that comply with Title 8 CCR 1529 of sufficient size to be clearly legible, displaying the following legend:

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

- E. Warning Sign Format: Vertical format conforming to Title 8 CCR 1532.1:

WARNING LEAD WORK AREA
POISON
NO SMOKING OR EATING

- F. Wherever the treatment process is reasonably expected to impact any lead-containing substances:
1. Post a sign 14" by 14" which includes the phrase, "Caution - Lead Hazard. Keep Out" in bold lettering at least 2" inches high.
 2. Postings shall be in English and Spanish, and in any language used by any of the Contractor's employees as the primary language of communication.

2.2 ENCAPSULANTS

- A. Encapsulants shall be U.L. Listed, in full-scale E-119 fire test.
- B. Average depth of penetration shall meet manufacturer's recommendations.
- C. 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.
- D. Performance Requirements: Classification - penetrating encapsulant; spray applied and brushable. Product shall be tested and listed by EPA and possess the following characteristics:

1. Impact Resistance- minimum 60 inch-lbs; (Batelle Standard).
2. Fire hazard classification ratings:
 - a. Flame resistance/flame spread ~25 (ASTM E162) V6
 - b. Fire classification - UL Class A approved in the specific or similar assembly to its intended application.
 - c. Product shall be tested and rated non-toxic and non-irritating under the Federal Hazardous Substances Control Act and contain no methylene chloride.
 - d. Product shall have been successfully applied in similar applications.
 - e. Material shall be tinted sufficiently to provide a readable contrast to background color to which it is applied.

2.3 PLASTIC SHEETING

- A. Use fire-retardant (FR) polyethylene (poly) film manufactured by PolyAmerica, Grand Prairie, Texas 75051, or equal.
 1. Thickness - 6-mil, minimum, NO EXCEPTIONS.
 2. Flame Resistance/Flame Spread Rate <25.
 3. Conforms to NFPA #701 and Tested in accordance with ASTM E-84.
- B. Spray adhesive for sealing polyethylene to polyethylene shall contain no methylene chloride or methyl chloroform (1,1,1-trichloroethane) compounds.

2.4 TAPE

- A. 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. Taping to critical or sensitive surfaces shall be completed using preservation sealing tape, such as 3M Scotch Brand No. 4811 Preservation Tape; or 3M Scotch Branch No. 472 Plastic Film Tape or approved equal.

2.5 STRIP CHART RECORDER(S)

- A. Where interior work areas are required, each shall have a minimum differential pressure of 0.025 inches water gauge at all times. Fluctuations below .025 inches of water column is unacceptable and may require temporary cessation of work until conditions are corrected.
- B. 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.
- C. 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 equal to a Dwyer Instrument Co.'s " Photohelic Gauge" 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 - 0.025 inches water gauge air pressure.
- D. The strip chart recorder will be checked a minimum of four 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.

- E. 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 independent DOP testing to document the effectiveness of the air filtration units. The test results shall be signed by the individual performing the testing. Repeat testing if the unit or the air filtration units have been repaired or replaced. Repeat DOP testing after thirty days.

2.6 VACUUM EQUIPMENT

- A. 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 DOP testing to document the effectiveness of the vacuum units. The test results shall be signed by the individual performing the testing.

2.7 LOCAL EXHAUST SYSTEM

- A. If containments are required, sufficient High Efficiency Particulate Absolute (HEPA) ventilation units shall be used to maintain the negative pressure in each interior work area at 0.025 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 shall remain in operation 24 hours a day, until clearance of the containment is achieved. 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:

1. A two stage pre-filter as follows: 100 micron low efficiency filter and a second stage medium prefilter for particle sizes down to 5 microns;
2. Lapse time meter showing accumulated hours of operation;
3. Electrical interlock preventing the operation of the unit without a HEPA filter;
4. Audible alarm and automatic shutdown system in the event of filter rupture or blockage of the discharge
5. Warning lights which indicate the status of the HEPA unit;
6. HEPA systems must provide sufficient exhaust air to maintain a negative pressure of 0.025 inches of water.

2.8 HOURS OF OPERATION FOR HEPA FILTRATION UNITS

- A. 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.

2.9 RESERVE EQUIPMENT

- A. Contractor to have the following equipment on site: two reserve, functioning and DOP-

tested HEPA Filter Vacuum Cleaning Units, two reserve and DOP-tested HEPA area filtration units for every four containments. Contractor shall also have sufficient polyethylene (poly), respirators, protective equipment, tape, tools, decontamination units, for each work area.

- B. Provide authorized visitors, Engineer, 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 maintain at all times 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.
- C. The Contractor shall document that each visitor has been trained and fit-tested prior to entering an abatement area.

2.10 SCAFFOLDING

- A. Scaffolding, as required to do the specified work, shall meet all applicable safety regulations and DOSH standards. A non-skid surface shall be furnished on all scaffold surfaces subject to foot traffic.

2.11 TRANSPORTATION EQUIPMENT

- A. 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

- A. 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.
- B. 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

- A. The hot water supply must be adequate to allow for 15 minutes of continuous usage while maintaining a water temperature of 85 F. At minimum provide UL rated 40-gallon electric water heater to supply hot water for the decontamination unit shower. Start from a 30-amp circuit breaker located within the decontamination unit subpanel. Provide relief valve compatible with water heater operation; pipe relief valve down to drip pan on floor with type L copper. Drip pans shall consist of a 24 inch X 24 inch X 6 inch deep pan, made of 19 gauge galvanized steel with handles. Drip pan shall be securely fastened to the water heater with bailing wire or similar material. Wiring of the water heater shall comply with NEMA, NEC and UL standards.

2.14 OTHER TOOLS AND EQUIPMENT

- A. 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 shall be inspected for contamination by the Environmental Consultant prior to use. Equipment not inspected by the Environmental Consultant or contaminated equipment shall be removed from the site immediately. The Contractor shall bear the cost of any clean-up, laboratory costs and Environmental Consultant's time associated with any clearance work resulting from the use of contaminated tools and equipment.

- B. All other materials not specifically described, but required shall be provided by the Contractor subject to the approval of the Environmental Consultant.
- C. Prohibited Equipment. The following equipment is prohibited from use on this project unless accepted in writing by the Engineer:
 - 1. High or low pressure water blasting equipment for hosing of work areas.
 - 2. Vacuum-powered removal or collection equipment located outside the asbestos work area, such as a "Vacu-Loader".
 - 3. Gasoline, propane, diesel or other fuel powered equipment inside the building, unless previously approved in writing by the Engineer and the Environmental Consultant.
 - 4. 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 Engineer.
 - 5. Metal wire-brushes.
 - 6. 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.
 - 7. Non-fire retardant polyethylene sheeting.
 - 8. 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.

PART 3 – EXECUTION

3.1 INITIAL AREA ISOLATION (ASBESTOS)

- A. 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.
- B. Provide all connections for temporary utilities in the work area needed throughout abatement. Temporary electrical power shall be according to OSHA and the National Electrical Code for Wet Environments.
- C. As required, establish designated limits for the hazardous materials work area with continuous barriers. Use barrier tape (3-inch) with a pre-printed asbestos warning throughout exterior asbestos abatement activities. Provide signs around the perimeter of all interior the works area according to EPA, OSHA, Cal-OSHA.
- D. Contractor shall conform to the City's lockout requirements where specified, and shall secure the work area at all times. Area entrances and exits shall be secured by the Contractor throughout the abatement phase. Unauthorized visitors are strictly prohibited. Only the Contractor, Environmental Consultant, and City's representatives

are permitted at the job site. Contractor shall ensure that all doors, gates, windows, and potential entrances to the work areas and the designated waste location areas are secured and locked at the end of each workday.

- E. Contractor shall store all materials, equipment, and supplies for the project inside the buildings or in areas designated by the Engineer.
- F. The Engineer 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 Engineer. Clearance for any contaminated areas will be determined by the Engineer and may include air sampling. The Contractor shall be responsible for all costs associated with the clean-up and testing resulting from containment breaches.
- G. 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 shall be sealed with two (2) layers of 6 mil polyethylene secured with duct tape, as applicable.

3.2 CONTAINMENT SET-UP PROCEDURES - ASBESTOS

- A. Containment is not required for the roof abatement work. However, all work shall be conducted within an asbestos regulated area as required by Cal-OSHA. Contractor shall seal operable windows and air intakes within 50 feet of the work area with two layers of 6-mil polyethylene sealed with tape.
- B. Contractor shall construct a full negative pressure containment(s) for the removal of ACMs rendered friable during removal. The full containment shall consist of two layers of 6-mil poly on the floors and a minimum of one layer of 4 or 6 mil poly on all walls, as appropriate. ~~Pony walls shall be constructed with 6-mil poly if the perimeter walls of the containment area do not extend to the deck above.~~
- ~~C. Contractor shall construct critical barrier negative pressure containment(s) for the removal of asbestos-containing floor tile, sheet vinyl, sink undercoating and window putty.~~
- D. To permit the inspection of the majority of the work area, the Contractor shall provide easily accessible viewing ports from the clean space into each abatement area. Viewing ports must be a minimum of 2' x 2', clear-see-through plastic with no scratches, tape or glue marks.
- E. 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 qualified technicians following the procedures outlined by the manufacturers. The original strip charts or copies shall be provided to the Engineer at the end of each work day. The Engineer shall be immediately notified of any variance in pressure that may result in asbestos fiber concentrations above the baseline in adjacent areas.
- F. The work area(s) shall be placed under negative pressure as outlined in this specification throughout the abatement work period.
- G. Approved fire extinguishers (Class ABC, multi-purpose, dry chemical type, rated: 4A; 60BC) shall be readily available to workers (maximum travel distance of 50 feet) inside and adjacent to work area(s). Personnel and emergency exits shall be clearly indicated on the inside of the containment area. The emergency exit plan shall be approved by the Engineer prior to the set up of any work areas.

- ~~H. A three-chambered decontamination unit shall be required during the abatement work conducted in full containment and all Class I removal work exceeding 10 square feet or 25 linear feet. The unit shall be located immediately outside the contained area. A pre-fabricated unit is acceptable. Chambers shall be arranged as follows: (1) a clean/change room shall be the first chamber entered from outside the work area, (2) a shower shall be located between the clean/change room and the dirty/change room, and (3) a dirty/change room shall be the last chamber before entering the work area.~~
- ~~1. 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.~~
 - ~~2. 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 three 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 in order to expedite material or personnel load-out.~~
 - ~~3. The worker shower(s) shall be equipped with a UL-rated, electric water heater capable of providing 15 minutes of continuous usage while maintaining an 85-degree F water 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 inch X 24 inch X 6 inch. Provide relief valve compatible with water heater operation; pipe relief valve down to drip pan on floor with type L copper. Drip pans shall consist of a 24 inch X 24 inch X 6 inch deep pan, made of 19 gauge galvanized steel with handles. Drip pan shall be securely fastened to the water heater with bailing wire or similar material. Wiring of the water heater shall comply with NEMA, NEC and UL standards.~~
 - ~~4. 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, the Contractor shall comply with all current local, state and federal codes relating to waste water release.~~
- I. A two-chamber decontamination unit may be allowed during the abatement work conducted in critical barrier containments. The unit shall be located immediately outside the contained area and shall contain a wash down area. A pre-fabricated unit is acceptable.

3.3 CONTAINMENT SET-UP PROCEDURES - LEAD

- A. All interior lead abatement work shall be conducted within the same containment areas constructed for the asbestos abatement work, described above.
- B. All exterior lead abatement work shall be conducted with 6-mil poly drop sheets sufficient in size to prevent dissemination of paint beyond the drop sheet or a minimum of 10 feet in all directions. A lead abatement regulated area shall be constructed with barrier tape and appropriate lead signage to limit access to the work areas.
- C. Exterior paint removal must be suspended for the work day if wind speed exceeds 15 miles per hour.
- D. The Engineer 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 above background level, etc.), the Contractor shall take immediate action to control the breach and clean the area to the satisfaction of the Engineer. Clearance for any contaminated areas will be determined by the Engineer.

3.4 PERSONNEL PROTECTION

A. Informed Workers:

1. All workers shall be informed of the hazards of asbestos and lead, and any other hazardous materials 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.

B. Personal Hygiene Practices:

1. The Contractor shall enforce and follow good personal hygiene practices during the abatement of hazardous materials. These practices will include but not be limited to the following:
 - a. 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.
 - b. If air monitoring data gathered by the City in areas adjacent to the work areas shows exposure to airborne asbestos, lead or other hazardous materials exceeding 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.

C. Respirators:

1. Establish a respirator program as outlined by ANSI and required by Cal-OSHA. Select respirators from those approved by the National Institute for Occupational Safety and Health (NIOSH). Respirators selected must be approved by the Competent Person. Submit program for review a minimum of five (5) working days prior to the commencement of abatement activities.
2. Respirators and Protective Equipment for Handling Asbestos and Lead:
 - 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) Interior asbestos abatement of textured drywall, acoustical ceiling treatment, compolith flooring, and drywall with joint compound. Powered Air Purifying respirators (PAPRs) with HEPA cartridges.~~
 - (3) Interior asbestos abatement of floor tile and associated mastics/leveling compounds, sheet vinyl, asbestos cement products, acoustical ceiling tile mastic, ceramic tile products, fire doors, and roofing materials: half-face respirators with HEPA cartridges and organic vapor cartridges (as necessary).
 - (4) All interior and exterior lead and exterior asbestos abatement work: NIOSH- approved, half-face respirators with HEPA cartridges.

3. If Estimated or Measured Exposure Exceeds PAPR:
Type C continuous flow or pressure-demand, supplied-air respirators if the average airborne concentration of asbestos exceeds 100 times the permissible exposure limits; i.e., 8-hour time-weighted average (TWA) and ceiling limit. Use the respirators presented in Title 8 CCR 1529 that afford adequate protection at such upper concentrations of airborne asbestos.
4. When Type C Respirators are Required:
 - a. The air supply system shall provide Grade D breathing air that conforms to OSHA and ANSI Commodity Specification for Air.
 - b. Compressed Air System for Type C Respirators shall be high pressure, with a compressor capable of satisfying the respirator manufacturer's recommendations. The receiver shall have sufficient capacity to allow a 15-minute escape time for the respirator wearers if the compressor fails or malfunctions. The compressed air system shall have compressor failure alarm, high temperature alarm, and a carbon monoxide alarm. It also shall have suitable in-line air purifying absorbent beds and filters to assure Grade D breathing air.
 - c. Use of Belt: Type C respirators shall be worn with belt to minimize possibility of dislodging face mask when hose is snagged in the work area.

D. Protective Clothing:

1. Provide personnel exposed to asbestos fibers and lead dust, with fire retardant disposable protective whole body clothing, head coverings, gloves, and foot coverings. Provide appropriate gloves to protect workers hands from exposure to hazardous materials. Make sleeves secure at the wrists and make foot coverings secure at the ankles with tape. Ensure that all personnel entering and leaving the work area 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 decontaminated or disposed of at the completion of the job.
2. 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.

E. Eye Protection: Provide safety glasses or goggles to personnel removing or handling asbestos and lead-containing materials and waste use.

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

3.5 CONTAINMENT AND DECONTAMINATION AREAS/SYSTEMS

- A. Prior to each work shift and continuously throughout the project, each containment and decontamination enclosure shall be inspected and repaired as needed.
- B. Ambient asbestos fiber levels outside each work area shall not exceed 0.01 f/cc (PCM) or 70 s/mm² (TEM). 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.

3.6 AMBIENT AIRBORNE LEAD LEVELS OUTSIDE THE WORK AREA

Ambient airborne lead levels outside the work area shall not exceed $1.5 \mu\text{g}/\text{m}^3$. If the airborne lead concentration outside the work area exceeds $1.5 \mu\text{g}/\text{m}^3$, then the abatement must stop. Contractor must take appropriate actions to reduce the airborne lead concentration within the acceptable limits.

3.7 ASBESTOS REMOVAL

- A. The Contractor shall abate all asbestos containing materials identified in the buildings listed in this specification.
- B. The Contractor shall continuously apply wetting agent throughout the removal process. The wetting agent shall be applied with a low-pressure fine spray to minimize fiber releases. The materials shall be thoroughly saturated so that there is no detectable fiber release. All ACM shall be immediately packaged in leak-tight containers following removal.
- C. Minimize removal activities of ACMs that generate airborne particulate. To the extent feasible, score or cut- out ACMs in sections, wetting along the scoring line continually, and misting the air with an airless sprayer to knock down suspended particulate.
- D. Weather conditions should be dry and wind conditions less than 15 mph for roof and other exterior abatement activities. Establish a waste storage area where sealed bags of roofing materials are stored during removal. Line the storage area with a layer of 6-mil polyethylene sheeting. Dampen the roof surface with a fine spray of amended water before proceeding with removal. Keep roofing damp throughout the removal process. Cut, peel, and scrape the roofing materials as required to remove the largest pieces possible in layers. Continue the removal until the roof decking is reached. Remove contaminated sleepers, flashing, and counter flashing as applicable. Bag or wrap roofing material in 6-mil polyethylene and dispose of by methods described herein. Transport bags without risk of their integrity to the disposal bin.
- E. Perimeter air sample results shall not exceed 0.01 f/cc (PCM). If airborne fiber concentrations should exceed the level shown above, then abatement must stop and operations be reviewed and modified until the fiber levels can be reduced to within acceptable limits.
- F. The Contractor shall transport asbestos-containing waste bags to the waste debris box at designated hours approved by the Engineer. RACM shall be packaged in a minimum of two (2) 6-mil polyethylene bags. Bags shall be properly labeled for RACM disposal including site-specific generator labels.
- G. Asbestos-containing debris and contaminated water shall be cleaned from the work area at the end of each work shift. The Contractor shall clean the work area using wet methods and HEPA vacuum equipment.

3.8 LEAD REMOVAL

- A. All painted surfaces are assumed to contain detectable concentrations of lead. Contractor shall remove any loose and peeling paint from the building substrates.
- B. Until an exposure assessment has been performed, Contractor shall treat all employees as if they were exposed to lead above the Permissible Exposure Level (PEL) and shall provide the following:

1. Appropriate respiratory protection to each employee;
 2. Appropriate personal protective clothing and equipment;
 3. Change areas and hand-washing facilities;
 4. Biological monitoring for each employee consisting of sampling and analysis for lead and zinc protoporphyrin levels.
- C. The Contractor shall continuously apply water during lead containing paint removal. The water shall be applied with a low-pressure fine spray to minimize airborne dust levels. All lead debris shall be immediately bagged following removal.
- D. Collect personal samples representative of a full shift including at least one sample for each job classification in each work area. Samples must be representative of the monitored employee's regular, daily exposure to lead.
- E. Employees must have proper training which includes the content of the lead standard; the specific nature of the operations which could result in exposure to lead above the action level; the purpose, proper selection, fitting, use and limitations of respirators; the purpose of the medical surveillance program; purpose of engineering controls; content of compliance plans; and the employee's right of access to records.
- F. The Contractor shall transport lead waste bags to the waste debris box at designated hours approved by the Engineer.
- G. The Contractor is responsible for proper statistical waste stream categorization, manifesting and disposal of lead paint as required by USEPA and applicable state and local regulations. The City, at its option may collect duplicate waste stream samples to verify the statistical methods used by the Contractor. In the event of conflict, the City's results will prevail. The Contractor at no additional expense to the City will appropriately dispose of the waste.
- H. Contractor shall collect all waste stream samples in the presence of the Engineer or his designee and shall supply the Engineer with a copy of the chain-of-custody within one (1) day of receipt by the laboratory.
- I. 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. Any lead- containing debris generated during removal shall also be immediately cleaned.

3.9 AIR MONITORING - ASBESTOS AND LEAD:

- A. The purpose of the air monitoring conducted by the City will be to detect possible release of fibers or dusts (asbestos or lead) emanating from the work areas.
- B. The City, at its discretion, may provide area monitoring as described in this specification. In addition to air monitoring within the work and adjacent areas, the City may conduct wipe samples to determine lead concentrations in settled dusts. If sample results indicate that conditions have exceeded the baseline, as determined by the Engineer, all work shall cease. Work shall not recommence until the condition(s) causing the increase have been corrected.
- C. All PCM air sample analysis shall comply with NIOSH Method 7400. All TEM analysis shall be consistent with modified-AHERA protocols.

- D. All lead air sampling shall comply with NIOSH 7082 method and NIOSH 7300 method.
- ~~E. The Engineer shall perform all final clearance inspection and sampling.~~
- ~~F. The method of analysis for pre-abatement and clearance air samples shall be via Phase Contrast Microscopy (PCM). The method of analysis for in-progress asbestos air samples shall be PCM and TEM at the option of the City.~~
- G. 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 asbestos and lead standards.

3.10 DECONTAMINATION - ASBESTOS

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

3.11 CLEARANCE INSPECTIONS - ASBESTOS

- A. Initial Visual Inspection: Contractor shall notify the City's representative when the decontamination process in each containment area is complete. Evidence of asbestos or lead dusts will require additional clean up by the Contractor. Contractor shall be responsible for re-cleaning all areas found to be deficient.
- B. Once the initial visual is passed, the Contractor shall remove all but the containment critical barriers.
- C. If the Engineer determines that the work area is sufficiently clean, the Contractor may proceed. If the Engineer 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 City for inspections required after the second inspection will be charged to the Contractor.
- D. Following the visual inspection, the Contractor shall provide a coating of non-diluted encapsulant in the work area. The Contractor shall allow the encapsulant to dry for the period specified by the manufacturer.
- ~~E. Asbestos Clearance Testing: Following encapsulation and drying time, the Contractor shall request that the City conduct air clearance sampling. Clearance air sampling shall not take place until all encapsulant is dry.~~

3.12 CLEARANCE CRITERIA - ASBESTOS

- A. After removal of remaining barriers, the Engineer 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 City. When the area is

clean, the Engineer shall provide the Contractor with a written notice of acceptance.

- B. The clearance level for each containment shall be less than 0.01 fibers per cubic centimeter via phase contrast microscopy (PCM) or less than 70 structures per square millimeter via transmission electron microscopy (TEM). Multiple samples may be collected depending on the size and configuration of the work areas.
- C. If air samples do not pass the required clearance criteria, the area shall be recleaned and new samples shall be collected by the Engineer. The Contractor shall be responsible for all costs associated with re-sampling and re-analyses. This amount will be deducted from the Contractor's final payment.
- D. The Engineer shall notify the Contractor in writing of acceptable asbestos fiber concentrations. The Contractor shall then remove all the remaining barriers in the work area.

3.13 HAZARDOUS MATERIALS DISPOSAL

- A. Load-Out Procedures:
 - 1. Ensure that polyethylene bags are sealed air-tight. All bags shall be wet cleaned prior to removing them from the equipment decontamination unit.
 - 2. 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.
- B. Asbestos and Lead Disposal Procedures:
 - 1. 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, local, state, and federal regulations and provide documentation of the same.
 - 2. Perform appropriate Total Threshold Limit Concentration (TTLC), Soluble Threshold Limit Concentration (STLC) and Toxicity Characteristic Leaching Procedure (TCLP) testing for paint waste disposal as required by this specification, by the regulations, and the selected landfill(s). All testing shall be done in the presence of the Engineer or his designee. Chain-of-custody forms shall be provided to the Engineer within one (1) day following sample delivery to the laboratory.
 - 3. 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 waste water release.
 - 4. Asbestos-containing waste that is properly labeled and double-bagged, may be temporarily stored in areas approved by the Engineer. Areas must be made secure before storing the waste. Waste is not to remain in temporary storage area for longer than four (4) days before final load-out of materials.
 - 5. All asbestos waste shall be double-wrapped prior to transport from the site.
 - 6. All vehicles used to transport hazardous waste must be registered with the Department of Toxic Substance Control and display the proper registration and expiration stickers.

7. 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.
8. Contractor shall not throw bags into the truck in a way that may cause the bags to burst open.
9. Contractor shall provide at minimum one (1) day advance notification to the Engineer when signatures are required on manifest(s). The Contractor shall ensure that the Hazardous Waste Manifest is correctly filled out. The Contractor shall give the appropriate copies to the Engineer and shall also instruct the Engineer in writing that they must send the appropriate copy to the Department of Toxic Substance Control.
10. If a debris box is used, the Contractor shall make all necessary arrangement with the City including obtaining all appropriate permits.
11. Contractor is responsible for all coordination with the waste disposal site and with the waste hauling company.
12. Debris box for hazardous waste shall be fully lined with a double layer of polyethylene sheeting and must be locked at all times when unattended.
13. Debris box shall be constructed with minimum 20-gauge steel with no windows or openings other than the door. The door of the container shall have a secure cover on the locking device with access to the lock only at the key-hole. Once the debris box is filled and the manifest is signed, Contractor must transport the debris box off the job site.
14. Disposal shall be in a landfill that meets EPA requirements. 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.

PART 4 – LABORATORY REPORTS

(Laborary Reports by RGA Environmental begin on the next page.)

END OF SECTION