HAZARDOUS MATERIALS ABATEMENT

1.1 COMPLIANCE AND INTENT

A. This project deals with both abatement of hazardous materials and general demolition. It is necessary for the contractor to coordinate all Abatement and general demolition work with the City of East Palo Alto. During all work, provide monitoring and worker protective equipment in accordance with applicable local, state, and federal regulations and as required by this specification. Where there is a conflict the most stringent requirement shall apply.

B. Furnish all labor, materials, facilities, equipment, services, employee training, medical surveillance, permits and agreements necessary to perform the work required for hazardous materials abatement in accordance with this specification.

C. Comply with all federal, state, and local regulations pertaining to hazardous materials removal, storage, transportation and disposal; employee health and safety; Contractor certifications; hazardous materials certifications; and all licenses, permits, and training.

D. Perform all work specified herein with competent persons trained, knowledgeable and qualified in state-of-the-art techniques relating to hazardous materials abatement, handling, and the subsequent cleaning of contaminated areas.

E. Perform appropriate Soluble Threshold Limit Concentration (STLC) and Toxicity Characteristic Leaching Procedure (TCLP) testing for lead waste disposal. All testing shall be done in the presence of the City’s Environmental Consultant. Chain-of-custody forms shall be provided to the City and the Environmental Consultant within one (1) day following sample delivery to the laboratory.

F. During removal activities, the Contractor shall protect against contamination of the building and property and shall ensure that there is no airborne release of hazardous materials and dusts. The City may collect air and wipe samples in the building to evaluate the Contractor’s performance. Evidence of settled dust or airborne levels of contaminants above background will require the implementation of additional controls at no extra cost to the City.

G. This section provides appropriate protocols for handling and disposal of the asbestos/lead containing paint residue that is to be removed according to the procedures outlined in this specification. If additional suspect hazardous materials are discovered during the course of the abatement work, immediately notify the City and/or the Environmental Consultant.

H. 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). Display copies of CSLB license and Cal-OSHA Certificates in a visible place at the job-site.

I. 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 City 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
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purpose, or any purpose. The City or the City’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.

J. All interior lead and asbestos abatement work shall be conducted using a negative pressure enclosure and three stage decontamination unit unless an alternative work plan is submitted and approved in advance by the Environmental Consultant.

K. All asbestos and lead abatement work shall be conducted using wet controls as specified herein. Evidence of the release of asbestos fibers or lead dusts above the background level will necessitate additional controls including but not limited to an enclosure.

1.2 SCOPE OF WORK

The work covered by this Specification consists of furnishing all transportation, labor, materials, equipment, and incidentals necessary for the handling, abatement, and disposal of damaged paints and coatings present on the exterior surface of a 20-foot long by 4-foot diameter steel water tank located on blocks at ground level inside the west end of the boat house at the subject site. The tank is coated with damaged paint and coatings reported by laboratory analysis to contain 220,000 parts per million lead and trace (<1%) to 3% asbestos totaling approximately 300 square feet. Given the mixed waste issue of lead and asbestos in the paint residue, this specification requires that the abated paint/coating residue be disposed of as regulated hazardous lead/asbestos waste utilizing a California Uniform Hazardous Waste Manifest with transport to an EPA-approved hazardous waste landfill by a California Registered Hazardous Waste Hauler. The estimated hazardous waste quantity to result from planned paint/coating abatement is less than ten gallons.

1.3 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-based Paint: Process of removal, clean up and disposal of lead-contamination or lead-based paint from building surfaces as required for demolition or renovation work.
- ACM: Asbestos-containing material
- Action Level - Asbestos: Employee exposure without regard to the use of respirators, to an airborne concentration of 0.1 fibers per cubic centimeter of air as determined via PCM microscopy.
- 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/m³) 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.
- 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.
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- 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-tenth of one percent (0.1 %) asbestos by weight.

- Asbestos: Asbestos includes asbestiform varieties of serpentinite (chrysotile), riebeckite (crocidolite) cummingtonite-gunnerite (amosite), anthophylite, 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.

- Asbestos Action Level: An airborne concentration of asbestos of 0.1 fibers per cubic centimeter (f/cc) of air calculated as an eight (8)-hour time-weighted average, at which preventive and corrective actions must be taken to lower the level of 0.1 f/cc.

- 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.

- Blood Lead Testing: All employees working on the job shall submit both pre 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 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 Transmission Electron Microscopy (TEM) will be less than 70 structures per square millimeter (< 70 s/mm2). Samples shall be collected by 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.

- Consulting CIH: City-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 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
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- 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 Hospital with any related handling operations.
- Disposal Bag: Minimum six (6) mil thick leak-tight plastic bags used for transporting asbestos waste from work place, 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 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 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.
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- EPA: Environmental Protection Agency.
- HEPA: High Efficiency Particulate Air filter capable of filtering out asbestos and lead 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.
- MSHA: Mine Safety and Health Administration: Together with NIOSH, they assign respirator numbers and affix safety label on each respirator assembly and its parts.
- Friable Asbestos-Containing Material: Material that contains more than 0.1% 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, 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. 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-chrome 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 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 1000 mg/kg or if the Soluble Threshold Limit Concentration (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/ m³) averaged over an 8-hour work period.
- 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).
• 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 Level (PEL) - 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 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 ug/m3)
• 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 facepiece 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 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).
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- Total Threshold Limit Concentration (TTLC): A material is considered as hazardous waste if laboratory test results indicate 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 Consulting CIH, 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 asbestos-related 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 29 CFR 1926.1101 and Cal-OSHA.
- Zinc Protoporphyrin (ZPP) Test: Biological test for lead-exposure that measures the amount of zinc protoporphyrin in blood.

1.3 REFERENCES

The publications listed below form a part of this specification 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 Z88.2 1992 Respiratory Protection
- 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 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

CALIFORNIA CODE OF REGULATIONS (CCR)
- CCR 5208

CALIFORNIA DEPARTMENT OF INDUSTRIAL RELATIONS (CDIR)
- DIVISION OF OCCUPATIONAL SAFETY AND HEALTH, TITLE 8, CALIFORNIA ADMINISTRATIVE CODE
- CDIR CARS Carcinogen and Asbestos Registration Sections 340-344.53, 341.6 Amended, and 341.9 Amended Through 341.14
- CDIR CSO Construction Safety Orders, Chapter 4, Subchapter 4
- CDIR ESO Electrical Safety Orders, Chapter 4, Subchapter 5
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CDIR 1529 Asbestos Construction Standard
CDIR 1532.1 Lead in Construction
CDIR 3203 Accident Prevention Program
CDIR 3204 Access to Employee Exposure and Medical Records
CDIR 3220 Emergency Action Plan
CDIR 3221 Fire Prevention Plan
CDIR 5194A Respiratory Protection Equipment Standard
CDIR 5194B Hazard Communication Standard
CDIR 5208 Asbestos Standard
CDIR 5209 Carcinogen Regulation
CDIR 6003 Accident Prevention Signs

CALIFORNIA HEALTH SERVICES (CHS)
TITLE 22 AND 23, CALIFORNIA ADMINISTRATIVE CODE DISPOSAL REQUIREMENTS
CHS 25123 Section 25123
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

CALIFORNIA LABOR CODE (CLC)
CLC DIVISION 5 Part 1, commencing with 6300

CALIFORNIA PROPOSITIONS (CP)
CP 65 Proposition 65

CALIFORNIA STATE BOARD OF EQUALIZATION (CSBE)
CSBE ETU Excise Tax Unit

CALIFORNIA STATE LICENSE BOARD (CSLB)
CSLB CBPC - California Business and Professional Code
Sections 7058.5 and 7058.7, "Certification

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
29 CFR 1910.1000 Air Contaminants
29 CFR 1926.1101 Asbestos
40 CFR 61-SUBPART M National Emission Standard for Asbestos
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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 Citys and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265 Interim Status Standard for Citys 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 Asbestos Containing Material in Schools
49 CFR 178 Shipping Container Specifications

UNDERWRITERS LABORATORIES INC. (UL)

1.4 SUBMITTALS

The following items shall be submitted to, and approved by, Environmental Consultant 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; location of decontamination unit; etc. Schedule showing milestone dates for activities such as mobilization, work area preparation, ACM/LBP removal, waste load-out, detail cleaning, final clearance evaluations, completion dates, etc.

B. Provide a site safety plan prior to project initiation. The site safety plan shall deal with, 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 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 Company Officer with authority to respond to emergencies.

C. Submittal of training records of employees whom Contractor will use on the job.

D. Competent Person (as defined by OSHA Regulation 29 CFR Part 1926.1101):

Meets the regulatory competent person requirements for supervision of asbestos and lead in paint activities including demolition and/or abatement projects, safe work practices, protective measures for building and personnel, and disposal procedures. This person shall have completed appropriate EPA accredited Contractor Supervisor courses in both asbestos and lead abatement and have a minimum of 2 years on-the-job experience.

E. Workers: Demonstrate education and specialized training with successful completion of an EPA approved training course.
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.

Proof of Respirator Fit Testing: Provide proof of quantitative respirator fit testing. Fit testing records must be less than six (6) months old and document testing on the type of respiratory protective equipment used for this project. Fit testing records must be signed by a Certified Industrial Hygienist.

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.

Written Notification Fire and Police Departments: Provide documentation showing notification of local fire and police departments of the abatement three (3) days before commencement.

Lead Waste: Lead-containing waste must be tested (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.

Submit written evidence that the landfill for disposal is approved for asbestos/lead 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 asbestos/lead materials delivered to the landfill. The manifest must be provided to the City of East Palo Alto within ten working days after delivery.

Satisfactory proof that written notification has been provided to the EPA regional office with jurisdiction over the project area and the Bay Area Air Quality Management District, in accordance with Title 40 CFR Part 61 Subparts A&M, National Emission Standards for hazardous Air Pollutant, U.S. EPA.

Ten-Day Notification: No fewer than ten (10) days before commencement of abatement, Contractor shall give written notice of the proposed abatement work. The Contractor shall provide information on handling and disposition of actions as required by federal, state, regional and local authorities (fire and police departments). Give copies of this information to the City's representative before starting the abatement.

Licenses: Submit copies of state and local licenses, evidence of Cal-OSHA certification and permits necessary to carry out the work of this contract.

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 City's representative.
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P. Biological Monitoring: All lead abatement workers must have baseline and post abatement blood lead level screenings determined by the whole blood lead method, utilizing Vena-Puncture technique. The blood tests will also be required at the end of each 30-day period. A worker will be removed from the job if, at any time, his blood lead level is measured at 30 µg/dl or greater (see Cal-OSHA). The Contractor shall be responsible for medical surveillance and record keeping.

Q. 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 City's representative prior to acceptance of final pay request and shall include the following:

1. 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),
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. Project Summary
   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 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, decon, etc.;
   k. Name, location, telephone number, and EPA registration of waste disposal site used.

1.5 ENVIRONMENTAL CONSULTANT/MONITORING TECHNICIAN

A. The Environmental Consultant will act as the City's liaison in technical matters involving the asbestos and lead removal and disposal work.

B. 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 dimensions and quantities that shall be confirmed at the job site.
C. The designated site representative of the Environmental Consultant is authorized by the City to have 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.

D. The Environmental Consultant will advise the City to stop the Contractor's work if, in the course of 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:
   1. Loss of negative pressurization;
   2. Activities or misconduct imperiling worker's or building occupant's safety; and
   3. Breaches in containment resulting in potential release of asbestos and/or lead to non-work areas.

E. 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 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/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.

F. If appropriate conditions are not made after two (2) warnings, or if an immediate threat exists that asbestos fibers or lead dust 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 City.

G. The Environmental 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.

H. When visual inspections or air monitoring are specified, the Contractor shall notify the City 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 zone has been previously inspected and is ready for inspection/testing.

I. The Environmental Consultant’s role in advising the City 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 regulatory 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.

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 contaminated material to the landfill.
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.

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
```

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
```


```
WARNING
LEAD WORK AREA
POISON
NO SMOKING OR EATING
```

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

1. Post a sign 14" by 14" 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 Contractor's employees as the primary language of communication.

2.2 ENCAPSULANTS:

A. Contractor is wholly responsible for ensuring that all encapsulant(s) used (including those recommended in this specification) are fully compatible with all replacement finishes.

B. Encapsulants shall be U.L. Listed, in full-scale E-119 fire test.

C. Average depth of penetration shall meet manufacturer's recommendations.

D. 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.

E. Performance Requirements: Classification - penetrating encapsulant; spray applied and brushable. Product shall be tested and listed by EPA and possess the following characteristics:
Asbestos/Lead in Paint on Steel Water Tank
Cooley Landing Park
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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.
   f. The Contractor is responsible for ensuring that all encapsulants used shall be compatible with all existing and intended finishes including floor tile and mastics.

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 VACUUM EQUIPMENT:
All vacuum equipment used in the work area shall use HEPA filtration systems and be of the wet-dry type.

2.6 LOCAL EXHAUST SYSTEM:

If containments are required based on air/wipe sample results, sufficient High Efficiency Particulate Absolute (HEPA) ventilation units shall be used to maintain the negative pressure in each interior work area at 0.03 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 the first wet cleaning is complete. 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 0.03 inches of water.

2.7 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.

2.8 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.

2.9 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.

2.10 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.

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 Environmental Consultant:
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 City 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 City. Refer to Document 00813 “Specific Project Requirements for additional construction noise requirements.

5. Metal wire-brushes (may be acceptable in certain instances for removing floor tile mastic from the wood substrate).

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.

3.1 INITIAL AREA ISOLATION (ASBESTOS AND LEAD)

A. Provide all necessary connections for temporary utilities in the work place during abatement. Temporary electrical power shall be according to OSHA and the National Electrical Code for Wet Environments.

B. As required, establish designated limits for the asbestos and lead work area with continuous barriers. Use barrier tape (3-inch) with a pre-printed asbestos warning and caution tape for lead work. Provide signs around the perimeter of the work area according to EPA, OSHA and Cal-OSHA requirements.

C. 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 City's 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 work day.

D. 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.

E. 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 Level II and lead dust 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.
CONTAINMENT SET-UP PROCEDURES – ASBESTOS/LEAD

A. The Contractor shall construct a negative-pressure containment (NPC) around the tank. The NPC shall consist of at least one layer of 6-mil, fire-retardant poly with a separate local exhaust system of a size appropriate to produce a minimum of 0.03” of water column differential with the interior of the building. The NPC shall have an individual decontamination area consisting of a single polyethylene chamber.

B. Contractor shall provide easily accessible viewing ports from the clean area 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, to permit the inspector to view the majority of the work area.

C. 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 Consultant at the end of each work day. Contractor shall be immediately notified of any variance in pressure that may result in asbestos fiber concentrations above the baseline in adjacent areas.

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

E. A three-chambered decontamination unit shall be required during the abatement work. The unit shall be located immediately outside the contained area. A pre-fabricated unit is acceptable. Chambers shall be arranged as follows: a clean/change room, a shower, and a dirty/change room.
   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 a continuous 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 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, comply with all current local, state and federal codes relating to waste water release.
For the exterior asbestos-containing paint abatement work, Contractor shall demark the area with barrier/caution tape and shall place a poly drop cloth on the sidewalk. Paint shall be removed using a chemical peel method so as to minimize dust and debris release.

### 3.3 PERSONNEL PROTECTION

**A. Inform Workers:**

1. 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.

**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 Environmental Consultant in areas adjacent to the work areas shows exposure to airborne asbestos, lead or other hazardous materials 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.

**C. Respirators:**

1. 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 jointly by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH). Respirators selected must be approved by the Consulting CIH. Submit program for review.

2. Respirators and Protective Equipment for Handling Asbestos and Lead:
   At minimum, provide each employee with the following respiratory protection and protective clothing for each work phase: Pre-cleaning, containment set-up, and containment removal work -NIOSH/MSHA-approved, half-face respirators with HEPA cartridges. All interior lead and asbestos abatement work NIOSH/MSHA-approved, full-face powered air purifying respirators with HEPA cartridges.

**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 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 work space 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.
Asbestos/Lead in Paint on Steel Water Tank
Cooley Landing Park
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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. Goggles:
Provide goggles to personnel engaged in asbestos and lead operations when half-face respirators are in use.

F. 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

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) 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.

3.5 AMBIENT AIRBORNE LEAD LEVELS OUTSIDE THE WORK AREA
Ambient airborne lead levels outside the work area shall not exceed 30 µg/m3 or baseline, whichever is less. If the airborne lead concentration inside or outside the work area exceeds 30 µg/m3, then the abatement must stop. Contractor must take appropriate actions to reduce the airborne lead concentration within the acceptable limits.

3.6 AIR MONITORING - ASBESTOS AND LEAD:
The purpose of the air monitoring conducted by the Environmental Consultant would be to detect possible release of fibers or dusts (asbestos or lead) emanating from the work area. The City, at its discretion, may provide area monitoring through the Environmental Consultant as described in this specification. In addition to air monitoring within the work and adjacent areas, the Environmental Consultant 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 City, all work shall cease. Work shall not recommence until the condition(s) causing the increase have been corrected.

A. All PCM air sample analysis shall comply with NIOSH Method 7400. All TEM analysis shall be consistent with AHERA protocol.

B. All lead air sampling shall comply with NIOSH 7082 method and NIOSH 7300 method.

C. The Environmental Consultant shall perform all final clearance inspection and sampling.

D. The method of analysis for asbestos air samples shall be Phase Contrast Microscopy (PCM).

E. 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.

3.7 DECONTAMINATION - ASBESTOS AND LEAD

A. Asbestos Decontamination:
1. 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.
2. No accumulation of debris or standing water will be permitted following the initial decontamination.
3. Prior to removing polyethylene sheeting and/or barrier containment, the Contractor shall wet wipe all work area surfaces and remove all evidence of paint chips from interior surfaces.

3.8 CLEARANCE INSPECTIONS - ASBESTOS AND LEAD

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 or paint chips will require additional clean up by the Contractor. Contractor shall be responsible for re-cleaning all areas found to be deficient.

If the Environmental Consultant determines that the work area is sufficiently clean, the Contractor may proceed with encapsulation. If the Environmental Consultant determines that certain areas require additional cleaning, the Contractor shall re-clean the work area and request a second inspection of the re-cleaned area.

Following a successful 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. Following encapsulation and drying time, the Contractor shall request that the Environmental Consultant conduct air clearance sampling.

B. Lead Clearance Testing:

After removal of polyethylene sheeting, the City 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 additional cost to the City.

3.9 CLEARANCE CRITERIA – ASBESTOS/LEAD

A. After removal of remaining barriers, the Environmental Consultant will conduct a final inspection of the 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 Environmental Consultant. When the area is clean, the Environmental Consultant shall provide the Contractor with a written notice of acceptance.

3.10 HAZARDOUS MATERIALS DISPOSAL

A. 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. Filter all waste water 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.

3. All asbestos waste shall be double-wrappe prior to transport from the work area.

4. All vehicles used to transport waste must be registered with the Department of Toxic Substance Control and display the proper registration and expiration stickers.

5. 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.

6. Contractor shall provide at minimum one (1) day advance notification to the City when signatures are required on manifest/manifests. The Contractor shall ensure that the Hazardous Waste Manifest is correctly filled out. The Contractor shall give the appropriate copies to the City and shall also instruct the City in writing that they must send the appropriate copy to the California Department of Public Health.

7. If a debris box is used, the Contractor shall make all necessary arrangement with the City including obtaining all appropriate permits.

8. Contractor is responsible for all coordination and costs related to the packaging, transport, and disposal cost with the waste disposal site and with the waste hauling companies.

END OF SECTION