SECTION 02 81 00

HAZARDOUS MATERIALS REMEDIATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. General provisions of the Contract, including General and Supplementary Conditions and other Division1 Specification Sections, apply to this Section.

B. Drawings including, but not limited to, Civil, Architectural, & Hazardous Materials

C. Hazardous Materials Survey & Soils Screening Report, Harder Elementary School, 495 Wyeth Rd., Hayward, California, prepared by Vista Environmental Consulting and dated November 8, 2016.

1.2 SUMMARY

A. This Section includes the following:

1. A general description of the hazardous materials related work associated with this project and including information regarding known and assumed (presumed) existing hazardous materials likely to be impacted and abated by this project.
2. Requirements and procedures related to asbestos abatement prior to building demolition
3. Requirements and procedures related to lead-related demolition work.
4. Requirements for removal and disposal of PCB ballasts, universal waste items, smoke detectors, and equipment with ozone depleting refrigerant gasses (CFCs, Freon) prior to building demolition.

B. Existing Hazardous Materials Conditions.

1. The Contractor shall take into account the known and presumed existing asbestos, lead-containing materials, and other hazardous materials known or assumed present based on existing survey reports provided by Hayward Unified School District (HUSD) and contract documents.
2. The Contractor's work requires removal of hazardous materials such as asbestos, PCBs, deteriorated lead containing paints, universal wastes (UW), and other hazardous materials and the disturbance of lead containing paints and coatings and soils contaminated with toxic metals, pesticides, and other organic chemicals. All associated costs of hazardous material remediation, worker protection, clean up and disposal are to be included in the bid price submitted.
3. Hazardous Materials known or assumed to be present in buildings to be demolished and area to be disturbed by work of this project include:
   a. Asbestos-Containing Materials:
      1) Main Building:
         a) Thermal System Insulation, 4" pipe & fittings (12% asbestos), RACM, throughout building in plumbing chases and spaces where occurs;

b) Acoustic Ceiling Plaster (2% asbestos), RACM, throughout building except for Multipurpose Room (MPR) and MPR associated adjacent rooms;

c) Window Glazing Compounds/Putty (2% asbestos), Category II Non-friable ACM, at all exterior windows throughout;

d) Window Frame Sealant, tan (10% asbestos), Category II Non-friable ACM, throughout building on exterior window frames;

e) Roofing mastic, (7-10% asbestos), Category I Non-friable ACM, at roof penetrations and patches;

f) Roofing tar, black (10% asbestos) Category I Non-friable ACM, at parapet and base flashing locations.

2) Classroom Wing 9-15:

a) Gypsum Wallboard with ACM Joint Compounds (2% asbestos for joint compound, < 1% asbestos as a wallboard composite by point count), found in Classrooms 14 & 15 only;

b) Thermal System Insulation (TSI), on 4” pipes & fittings (12% asbestos), RACM, throughout building in plumbing chases and spaces (where occurs);

c) Window Frame Sealant, tan (5-10% asbestos), Category II Non-friable ACM at exterior windows throughout building;

d) Fascia Sealant, grey (10% asbestos), Category II Non-friable ACM, throughout on exterior building fascia;

e) Roof Mastic (7-10% asbestos), Category I Non-friable ACM at roof penetrations and patches.

3) Portable Classrooms:

a) Window Frame, Door Frame, and Exterior Seam Sealants, tan (5-7% asbestos), Category II Non-Friable ACM, exterior window, doors, and siding seams of Portables 16A, 17, and 18 only.

b) Window Frame and Door Frame Sealants, black (2% asbestos), Category II Non-Friable ACM, exterior windows and doors of Portable 23 only;

c) Roof Sealants, off white (5% asbestos), Category II Non-Friable ACM at roof seams of Portables 16A, 17, & 18 only.

4) Subsurface Utility Piping and/or Conduit

a) All subsurface utility piping and conduit is assumed to be of asbestos cement (AC) type unless proven otherwise. Refer to Civil drawings for approximate location and extent.

b. Lead-Containing Paints (LCP) - All untested paints shall be considered lead-containing paint (LCP) with detectable levels of lead and for pre-1978 construction shall be considered to be lead-based paint (LBP) unless proven otherwise. Existing survey results by XRF indicate LBP level of lead were detected as follows:

1) Main Building: Exterior wood columns, fascia, and window & door frames. Interior wood window frame and door frame components, metal windows, ceramic wall tile glazes (restrooms & office). All other painted components are considered to be LCP coated.

2) Classroom Wing 9-15: Exterior wood columns, window frames, fascia, overhang & beam; Exterior metal windows and downspout; Interior wood window sill; all other painted components are considered to be LCP.

3) Portable Classrooms (all): No LBP detected; all paints are considered to be LCP.

c. Polychlorinated Biphenyl (PCB): All buildings and portable classrooms contain fluorescent light fixtures with assumed PCB ballasts pending the Contractor's inspection of each fixture's ballast for labeling or marking regarding date of manufacture and/or PCB content.

d. Universal Waste Items: All buildings and portable classrooms have fluorescent light tubes and/or lamps and some have associated high intensity lamps and emergency batteries that are considered to be UW items.

e. Coolant Gasses (e.g. CFC's): Equipment with coolant gasses are present in Main building and each portable to be removed/demolished. Coolant gasses associated with HVAC and refrigerant equipment are assumed to contain ozone depleting Freon type requiring recycling.

f. Smoke Detectors: All buildings and portables have smoke detectors assumed to contain radioactive material sources requiring special handling and disposal procedures.

g. Surficial Site Soils: Limited sampling of the site's surficial soils at 0-6 inches below ground surface (bgs) has indicated the presence of various toxic metals, pesticides, and petroleum hydrocarbons that will be disturbed during site work and will require further testing and evaluation and handling by the Contactor prior to re-use or disposal.

h. Review the reference hazardous materials survey report for more specific information regarding hazardous materials and substances present at this site and review the hazardous materials drawings for reference information regarding quantities of each type of material to be field verified by the Contractor prior to submitting a bid.

C. Summary of Hazardous Materials-Related Work

1. The work of this project involves removing all asbestos-containing materials and other identified hazardous materials prior to general structural demolition. Removal of other hazardous materials includes removing all PCB lighting ballasts, Universal Waste Items, reclaiming regulated coolant gases from HVAC & refrigerant equipment present, removing smoke detectors with radioactive material ionization sources, and removing or stabilizing all loose and flaking LBP prior to general structural demolition.

2. The structural demolition of this project involves disturbing lead in the paints and coatings on the buildings and portable classrooms. The Contractor is responsible for proper removal and disposal of all hazardous waste generated by this demolition project and is responsible for completing all work without adding to site contamination above background level prior to the start of work.

3. The Contractor shall review all available as-built plans and all project demolition plans for the buildings and infrastructure associated with this project and coordinate the hazardous materials work with those plans and the information they provide.This project will require Contractor personnel qualified to conduct asbestos–related work primarily of OSHA Class I & Class II ACM removal work and lead-related construction/demolition work. The project also requires removal and proper disposal of PCB ballasts, Universal Wastes, Smoke Detectors and Coolant Gasses. In addition, soil disturbance will involve contact with toxic metals and organic chemicals. Review the hazardous material survey report and project

drawings in detail to verify the location and approximate extent of hazardous materials-impacted work and include the cost of that work in the project bid price.

4. All hazardous materials and substance disturbance and removal work shall be undertaken utilizing the proper asbestos, lead and hazardous materials work practices, protective measures, controls, waste stream profiling and testing, and waste disposal of properly characterized removed materials as required to support this project.
   a. Removed friable asbestos wastes, lead paint chips, and PCB ballasts are to be disposed of as hazardous waste;
   b. Removed non-friable asbestos wastes and wallboard systems shall be manifested and disposed of as non-hazardous asbestos wastes;
   c. Universal Wastes shall be disposed of as hazardous waste or recycled by a permitted TSD.
   d. Coolant gasses must be reclaimed and recycled in accordance with federal and state regulation.
   e. Smoke detectors with radioactive sources must be properly disposed of per regulation.
   f. Any soil removal and disposal requires waste characterization and testing.
5. The Contractor's work scope shall require all lead-related protective measures for Cal/OSHA and Cal/EPA compliance associated with demolition and other finish disturbing activities of this project.
6. Conduct removal of existing asbestos-containing materials and/or lead-containing paints and coatings in compliance with Cal/OSHA worker protection rules and this section.
7. Clean up all surfaces affected by demolition so as to leave each work area and the site with asbestos and lead levels below all recognized hazard thresholds at the end of each day's work shift and prior to any site preparation for new construction.

D. Owner's Observation Service

1. The Owner will retain the services of a qualified industrial hygiene consultant certified for asbestos and lead consulting in the State of California, for the purpose of monitoring the day to day operations of the Contractor on an ongoing or as needed basis to ensure each work area is completed before it is released for unrestricted access by the Owner or others. This consultant shall be referred to as the Owner's Observation Service (Observation Service) and shall have authority to review the Contractor's pre-start, progress, and close out submittals; inspect containments, observe Contractor's procedural compliance, review Work Areas for completion, and conduct clearance inspection and testing with regard to asbestos and, where appropriate, other hazardous material removals and lead-related demolition.
2. The Contractor is obligated to provide notification to the Observation Service at least 48 hours in advance of starting site work that will disturb asbestos-containing materials to allow for startup inspection and 48 hours prior to any final clearance inspection and testing. Any delay caused by the failure to give proper notification to the Observation Service shall be at no cost to the Owner.

1.3 REFERENCES:

A. General: Codes, regulations, and references to hazardous materials abatement work include, but are not limited to the most current versions of the following:

1. California Code of Regulations (CCR):

Title 8; Article 2.5	Registration Asbestos-Related Work
Title 8, Section 1529	Construction Safety Orders, Asbestos Regulations
Title 8, Section 1531	Construction Safety Orders, Respiratory Protection
Title 8, Section 1532.1	Construction Safety Orders, Lead in Construction
Title 17, Div. 1, Ch. 8	Accreditation, Certification, and Work Practices for Lead-Based Paint and Lead Hazards
Title 22, Div. 4.5	Environmental Health Standards for the Management of Hazardous Waste

2. California Health and Safety Code, Division 20, Chapter 6.5, Section 25143.2 (d)(7), (e), & (f) and sections 25143.9 & 25143.10 – regarding the recycling of CFC or HCFC gases.

3. Code of Federal Regulations (CFR)
   a. 40 CFR Part 82 Protection of Stratospheric Ozone: Supplemental Rule Regarding a Recycling Standard Under Section 608 of the Clean Air Act; Final Rule
   b. 40 CFR Part 61 USEPA NESHAPS Rule
   c. 40 CFR Part 745 Lead; Identification of Dangerous Levels of Lead
   d. 40 CFR Part 761 , PCB's Manufacturing, Processing, Distribution, in Commerce, and use Prohibitions
   e. 40 CFR Part 763 USEPA AHERA Asbestos-Containing Materials In School; Final Rule and Notice

4. Regional Air Quality Management District or Air Pollution Control District rules:
   a. Bay Area Air Quality Management District (BAAQMD), Regulation 2, Rule 11

1.4 DEFINITIONS

A. Definitions Specific to Work of this Section.

1. Abatement – Procedures to control airborne contaminates and other releases from hazardous material-containing building materials. Includes removal, repair, encapsulation, and enclosure as well as proper packaging, transportation and disposal of removed hazardous materials.

2. Aggressive Method – removal of building materials by sanding, abrading, grinding, or other methods that cause intact ACM to become friable.

3. Airlock – A system for permitting ingress and egress with minimum air movement between a contaminated area and an uncontaminated area.

4. Air Monitoring – The processing of measuring the air contaminants such as asbestos or lead for measured volume of air collected over the specific period of time being monitored.

5. Amended Water – A water to which a suitable surfactant has been added in accordance with the manufacturer's instructions for the surfactant product.

6. Asbestos – The term asbestos includes chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite.

7. Asbestos Containing Construction Material (ACCM) – Any construction material with an asbestos content of 0.1 percent or greater by weight.

8. Asbestos Containing Material (ACM) – Any material which contains over one percent asbestos as determined by current EPA bulk sample analysis method.
9. Asbestos Fibers – This expression refers to asbestos fibers longer than five micrometers with an aspect ratio of 3:1 or larger under phase contrast microscopy (PCM) analytical procedures.
10. Authorized Visitor – Any Owner Representative, Consultant or Agent and any representative of a regulatory of other agency having jurisdiction over the project and who meets regulatory requirements for entry including training, medical, and proper personal protective equipment use.
11. Class I Asbestos Removal – Class I Asbestos work means activities involving the removal of known or presumed thermal system insulation (TSI) ACM and surfacing ACM.
12. Class II Asbestos Work – Class II Asbestos Work means activities associated with removal of any ACM that is not a Class I surfacing material or thermal system insulation. This includes but is not limited to, removal of resilient flooring materials, roofing materials, asbestos cement products, sealants, caulking materials as well as other ACM's.
13. Class III Asbestos Work – For this project-small scale removal work incidental to support removal or installation of equipment and devices where not intentional asbestos abatement work or removal is involved and the quantity of asbestos waste can be contained in one standard waste bag or glove bag with dimension no greater than 60"by60" (60 inches square).
14. Class IV Asbestos Work- work by maintenance and custodial workers that requires contact with ACM but for this section does not involve activities that require disturbance of ACM in a manner that could result in airborne asbestos fiber exposure to the workers.
15. Clean Room – An uncontaminated area or room that is a part of the worker decontamination enclosure with provisions for storage of Workers' street clothes and uncontaminated protective equipment and other uncontaminated materials and equipment.
16. Competent Person – An individual who is capable of identifying asbestos or lead hazards in the workplace and who has sufficient experience and authority to take prompt corrective measures to eliminate them. The Competent Person is required to have been specially trained for the type and level of work to be conducted. The Competent Person is responsible for conducting all required set/containment, in process, completion, and pre-clearance inspections as specified subject to verification and approval by the Owner's Consultant."
17. Coolant gasses – Refrigerant gasses that are known or suspected to contain regulated chlorofluorocarbon (CFC) or HCFC gasses whose release to the atmosphere is prohibited and that required special equipment and EPA certified refrigerant reclaimer personnel to safely and properly remove the gas for recycling or destruction at a permitted facility so that the remaining equipment to be demolished or removed can be disposed of in accordance with regulation.
18. Critical Barrier – A unit of temporary construction of air-tight and impermeable barrier which provides effective separation between a contained asbestos Work Area and an adjacent, potentially occupied area. Typically consists of at least two layers of plastic sealed to prevent fiber migration into a non-involved adjacent area.
19. Decontamination Enclosure System (Decon Unit) – A series of connected rooms, with air lock doorways between any two adjacent rooms, for the decontamination of Workers and of materials and equipment. The decontamination enclosure system includes an

Equipment Room, Shower Room, and Clean Room and must be contiguous to the Work Area Containment. Alternative systems including remote Decon Units and/or showers require prior approval.

20. Differential Pressure Equipment – A portable local exhaust system equipped with HEPA filtration and capable of maintaining a constant, low velocity air flow into contaminated area from adjacent uncontaminated areas. Also referred to as HEPA Exhaust Units, Negative Air Machines (NAM's) or Negative Pressure Units (NPU's). This equipment must meet the HEPA filter efficiency as an installed system, typically by on-site testing prior to use.
21. Disturbance – contact with asbestos-containing construction materials that disrupt their matrix (e.g. render friable) and create visible dust or debris and potential airborne fiber exposure.
22. Encapsulant (sealant) – A liquid material which can be applied to asbestos-containing material or surface and which controls the possible release of asbestos fiber from the material or surface by creating a membrane over the surface (bridging encapsulant), or by penetrating into the material and binding its components together (penetrating encapsulant), or by locking down invisible fibers (lockdown encapsulant).
23. Equipment Room – a contaminated room in the Decon Unit for decontamination of PPE and equipment prior to entering the shower room or area. The Equipment Room or area is supplied with impermeable waste bags or containers for the disposal of contaminated PPE and equipment.
24. Fluorescent Light Ballast (FLB) -- A device that electrically controls fluorescent light fixtures. Most existing FLBs include a capacitor containing 0.1 kilograms or less of a dielectric fluid that may contain PCBs if the ballast was manufactured prior to 1979. More recently, electronic ballasts that do not contain PCBs have come into use. Pre-1979 ballasts may also contain asphalt potting compounds that also contain PCB.
25. Fluorescent Lamp or Tube – A low pressure electric discharge lamp that generates ultraviolet light radiation by the passage of an arc through mercury vapor; the inner surface of the lamp or tube is coated with a phosphor which absorbs the ultraviolet light and converts some of it to visible light. Spent fluorescent light tubes typically contain mercury in concentrations exceeding the total threshold limit concentration (TTLC) and/or the soluble threshold limit concentration (STLC) making them a presumptive hazardous waste in California. Under current regulation, they are considered a Universal Waste requiring special handling and disposal or recycling.
26. Friable ACM – An ACM that that when dry can be crumbled, pulverized, or reduced to power by hand pressure. A non-friable ACM that has not be rendered friable by mechanical or other means is considered "intact."
27. Hazardous Materials – Hazardous materials include, but are not limited to: asbestos-containing construction materials, lead and lead-based paint, mercury, PCB, coolant gases, universal wastes, solvents, fuels and other chemical products or wastes.
28. Hazardous Waste – Any waste material ta is listed or meets the criteria for hazardous waste as set forth in the California Code of Regulations (CCR), Title 22, Chapter 11.
29. HEPA Filter – A high-efficiency particulate absolute (HEPA) filter capable of trapping and retaining 99.97 percent of particles equal or greater than 0.3 micrometers (micron) in mass median aerodynamic equivalent diameter.

30. HEPA Vacuum Equipment – Vacuuming equipment with a HEPA (UL 586 labeled) filter system. The vacuum must meet the HEPA efficiency of 99.97% efficiency for mono-dispersed 0.3 micron diameter particle as a system. On site testing may be required to verify the vacuum system meets HEPA requirements.
31. Ionization Technology Smoke Detector – Smoke detectors with radioactive isotope source (Americium 241) for smoke detection. Should be designated as such by an “i” or the word “Ionization” on front or back. Special disposal restriction apply. Photoelectric technology smoke detectors do not have a radioactive material source and are usually designated with a “P” or the word “Photoelectric”.
32. Lead-Based Paint (LBP) – Lead-Containing Paint (LCP) that is at least 0.5% lead by weight or 1.0 milligrams of lead per square centimeter of surface area (as measured by XRF lead analyzer). Note: any untested paints or coatings must be presumed to be LBP for structures constructed prior to1978 and any other untested paints or paints found to have no detectable lead by XRF testing only must be assumed to contain some detectable lead subject to OSHA regulation.
33. Lead Hazardous Waste – Lead-based paint waste or other debris that has been classified as hazardous due to the characteristic of toxicity, as determined by testing in accordance with the California Code of Regulations, Title 22, Division 4.5. A lead hazardous waste is any substance(s) at concentrations greater than its listed Soluble Threshold Limit Concentration (STLC) or Total Threshold Limit Concentration (TTLC). The STLC for lead is 5.0 parts per million (ppm) and the TTLC for lead is 1000 ppm lead. If either of these values are exceeded, the lead related waste will need to be further characterized by the Toxicity Characteristic Leaching Procedure (TCLP) in accordance with 40 CFR 261 and possibly other tests prior to disposal as a hazardous waste. Waste testing for proper disposal is the responsibility of the Contractor.
34. Lead Paint Surface Preparation – The process of conducting surface preparation on building surfaces and components that a coated with LCP or LBP in order to remove loose, peeling, flaking paint and associated chalking, if present, to prepare surface for paint stabilization, painting or demolition.
35. Mercury – A silvery liquid, metallic element which is toxic by inhalation and skin absorption. Mercury is a poison to the central nervous system and gastrointestinal tract and is considered to be an inorganic persistent and bioaccumulative toxic substance subject to Cal/PPA hazardous waste regulation. Mercury can often be found in various gauges, thermostats, mercury switches, fluorescent and high intensity lamps, and other items or equipment.
36. Negative Pressure Enclosure (NPE) – An enclosed or contained area of any configuration constructed of polyethylene sheeting (6 mil minimum) with a minimum of four (4) air changes per hour and a negative pressure of -0.02 inches of water as compared to surrounding areas outside the enclosure. NPE conditions must be maintained operational until the Work Area passes final clearance inspection and clearance air testing.
37. Non-Friable Asbestos Material – Material that contains asbestos in which the fibers have been locked in by a bonding agent, coating binder, or other material so that the asbestos is well bound and will not release fibers in excess of the asbestos control limit during any appropriate use, handling, demolition, storage, transportation, processing, or disposal.
38. Non-hazardous Asbestos Waste – Wastes which are non-friable and/or are below one percent asbestos by weight as determined by objective testing. Non-friable (intact) ACM

wastes require OSHA Asbestos Hazard warning labels and disposal at landfills that accept such asbestos wastes.

39. Observation Service – Environmental Consultant hired to conduct various construction administration services including but not limited to compliance observation and air monitoring services on behalf of the Owner. Sometimes referred to as the Owner's Observation Service.
40. Owner - Hayward Unified School District
41. Owner's Representative – Representative(s) that the Owner has assigned to manage, oversee, and inspect this project. This may include an architectural and/or construction management consultant hired by Owner to oversee the project and/or the assigned Construction Inspector.
42. Polychlorinated Biphenyl (PCB) – PCBs are chemical substances consisting of the biphenyl molecule chlorinated to varying degrees or any combination of such molecules. PCBs were used in the past as dielectric fluids in transformers and capacitors. PCB was often a contaminant in hydraulic fluids systems. PCBs are clear to yellow oily substances toxic to liver and reproductive system and are suspect human carcinogens.
43. PCB Ballast – A FLB known or suspected to contain PCB's. All FLBs must be considered to be PCB ballasts unless they are: Labeled or marked "No PCB" by the manufacturer; Manufactured in 1979 or later as indicated and verified on a date stamp or code located on the ballast; labeled as electronic ballast by the manufacturer; or General Electric HDF ballasts manufactured between 1977 to 1978 and which have a "W" added to their catalogue number on the ballast label.
44. PCB Equipment – Equipment such as transformers, switch gear, circuit breakers that contain oils or dielectric fluids likely to have been manufactured prior to July 2, 1979. If there is no date and the dielectric fluid is unknown, the equipment must be assumed to contain PCB.
45. PCB Contaminated Equipment – Equipment which contains fluid with a PCB concentration equal to or greater than 50 parts per million (ppm) PCB and less than 500 ppm PCB.
46. PCB Contaminated Material – A non-liquid material containing PCBs at concentrations greater than 50 ppm but less than 500 ppm PCB or where insufficient liquid material is available for analysis; a non-porous surface having a surface concentration of greater than 10 micrograms PCB per 100 square centimeter but less than 100 micrograms PCB, measured by a standard wipe test defined in 40 CFR 761.123.
47. Regulated Area – A Work Area established to demarcate areas where Class I, Class II, Class III is conducted and any other Work Area where airborne asbestos is reasonably likely to exceed the Permissible Exposure Limit (PEL). The Regulated Area must include all adjoining areas where asbestos waste and debris may accumulate. Demarcation must include warning signage and must limit access to authorized and properly trained, medically qualified, and protected personnel.
48. Removal – Procedures necessary to remove hazardous materials such as, but not limited to, asbestos or lead from designated areas and to dispose of these materials at an acceptable properly permitted waste disposal site.
49. Surfactant – An approved chemical wetting agent added to water to improve penetration.
50. Stabilization – Lead Paint Surface Preparation followed by application of at minimum a primer coat and usually followed by finish coating(s).

51. Trigger Task – Operation, process or task type specifically identified in the OSHA or Cal/OSHA lead standard as a potential lead exposure requiring certain protective measures to be implemented prior to obtaining the results of an initial exposure assessment. Trigger Tasks include, but are not limited to, any of the following task types when materials or paints that contain lead are present and will be disturbed:
    a. Manual Demolition;
    b. Manual Scraping or Sanding;
    c. Heat Gun Application;
    d. Use of power tools for cleaning or removal;
    e. Rivet busting;
    f. Abrasive blasting and cleanup of spent abrasive; &
    g. Welding, cutting or torch burning.
52. TSD Facility – An US EPA or State EPA permitted facility for transportation, storage and disposal of hazardous wastes.
53. Unclassified Asbestos Work – work involved in removal or disturbance of construction materials with 1% asbestos or less (e.g. trace asbestos). Worker protection and certain work practices are required for this work.
54. Universal Waste – Certain common designated hazardous wastes that are required to be handled and disposed of or recycled in accordance with special rules. Includes fluorescent light tubes, HID lamps, sodium vapor lamps, mercury switches, mercury thermostats, NiCad, Silver, & Mercury & other batteries (often used in building alarms and emergency systems), and other items.
55. Visually Clean – Free of visible dust, paint chips, dirt, debris, or films removable by vacuuming or wet cleaning methods specified. For outside soil or ground cover areas, visually clean shall mean free of visible construction and paint debris, chips or dust distinguishable from the initial soil or ground conditions (after exterior pre-cleaning).
56. Waste Generator Label – Waste Generator label shall include the Generator's Name, ID Number, Address, and Waste Manifest Number.
57. Wet Cleaning – The process of eliminating asbestos or lead contamination from building surfaces and objects by using cloths, mops, or other cleaning tools that have been dampened with water or water/detergent solution, and by afterwards disposing of these cleaning tools and materials as contaminated waste.
58. Work Area – Designated rooms, spaces, or areas of the project in which hazardous material removal actions are to be undertaken or which may become contaminated as a result of such removal actions during the process and prior to final clean-up and decontamination. A contained Work Area is a Regulated Work Area that has been sealed and equipped with a Decontamination Enclosure System. Worker Decontamination Enclosure System (Worker Decon) – That portion of a Decontamination Enclosure System designed for controlled passage of workers, and other personnel and authorized visitors, typically consisting of a clean room, a shower room, and an equipment room. No eating, drinking or smoking is allowed in Work Areas.

1.5 MATERIALS OWNERSHIP

A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, demolished materials shall become Contractor's property and shall be removed from Project site and properly disposed or recycled.

1.6 SUBMITTALS

A. Requirements are as set forth in Contract for items required to be submitted under this section. Submit the following:

B. Pre-Start Submittals:

1. Submit the following:

a. Licensing and Registration for Contractor or Subcontractor responsible for removal of hazardous materials. Submit copies of current and valid:

1) The Contractor's license and Contractor's asbestos certificate issued by the California State Contractor's Licensing Board (CSLB);

2) C-22 Asbestos Abatement Contractor license and Registration for Asbestos-Related Work from the Division of Occupational Safety and Health in accordance with CCR, Title 8, Article 2.5 of the California Administrative Code for any removal or disturbance involving greater than 100 square feet of ACM.

b. Personnel Qualifications: Personnel documents required per this section shall be organized by individual employee and include the following information:

c. Personnel Training:

1) Competent Person/Supervisor (Asbestos-Class I & II Removal Work): Submit training certificates for Contractor/Supervisor Training by Cal/OSHA accredited provider.

2) Workers (Class I & II Removal Work): Submit training certificates for Asbestos Workers Training by Cal/OSHA accredited provider.

3) All workers and their supervisors performing lead-related construction or other hazardous material (PCBs, UW, etc.) work shall have proper hazard communication training as appropriate to the associated hazard and have documentation available for examination upon request.

d. Medical Examination:

1) Asbestos-related work: Submit proof that personnel who will be performing asbestos-related work have had medical examinations within the last 12 months in conformance with Title 8 CCR; Section 1529 asbestos, and furnish the results of each exam in the form of the physician's written opinion or approval with regard to worker fitness to wear a respirator and perform asbestos work as applicable;

2) Lead-Related Work: Submit proof of medical surveillance completion for each worker performing a "trigger task" or any work likely to result in an airborne lead exposure greater than the PEL or lead.

e. Respirator fit tests: Submit proof that personnel who will be entering asbestos or lead Regulated Areas have had a qualitative respiratory fit test performed within 12 months from the scheduled completion date of the project.

2. Notifications, Communications, and Postings.
   a. Submit copies of notifications to appropriate government agencies where required, including the following:
      1) Cal/OSHA District Office: Submit Temporary Work Site Notification for asbestos removal involving greater than 100 SF of ACCM at least 24 in advance of start of asbestos work providing date and time of commencement of work, location, approximate duration, type of business, and kind of job. Provide a copy to Observation Service in pre-start submittal package.
      2) Cal/OSHA District Office: Submit Lead-Work Pre-Job Notification for Lead-Based Paint (LBP) related construction work that includes any Trigger Tasks that will involve removing or disturbing greater than 100 SF or 100 LF of LBP. Submit written notification at least 24 hours in advance of startup of the work. Include contractor name and contact information, address of work location, planned start and estimated end dates, number of workers, type of structure, number of workers, amount of lead containing material to be disturbed, description of work and work practices to be used. Provide a copy to Observation Service in pre-start submittal package.
      3) Bay Area Air Quality Management District (BAAQMD): Submit notification of every demolition regardless of presence or absence of RACM and every renovation involving removal of RACM in amounts greater or equal to 100 SF, 100LF or 35 cubic feet. Submit according to AQMD regulation at least ten (10) working days prior to start of work and provided copy to the Observation Service with the Pre-Start Submittal.
      4) Submit copies of any agency notification amendments and changes on a timely basis with a copy to the Observation Service concurrently.
3. Respiratory Protection Plan: Submit a written standard operating procedure governing selection, fit-testing, and use of respirators for asbestos, lead, or other airborne toxic material exposure protection.
4. Detailed Work Plan: Submit a detailed work plan proposed for use in complying with the requirements of these specifications and project plans. The detailed work plan shall include, at a minimum, the following information:
   a. Procedures: Job-specific procedures proposed for completing the scope of work outlined herein including: means of controlling and containing dust, preventing fugitive emissions, and controlling worker exposure for lead-related construction/demolition work and all Class I or Class II asbestos removal and clean-up work.
5. Plan for personnel air monitoring required by law by the Contractor for Worker protection. The Plan shall include, but not be limited to the following:
   a. Personnel Air Monitoring conducted in strict accordance with 8 CCR 1529 for asbestos and 8CCR 1532.1 for lead-related work. Include calibration data for the secondary standard to be used for air sampling pump calibration on-site. This data must be within six (6) months of the projected completion of this project;
   b. Name, address, and accreditation and/or certification of laboratory selected by the contractor to analyze air samples;
   c. The plan shall include a commitment by the Contractor to submit copies of laboratory results with information regarding personnel and operation sampled as required by

Cal/OSHA to the Observation Service within 24 hours of receipt of results as and no later than 72 hours from date of the exposure monitoring.

6. Product Data: Manufacturers product data for all items required for complete and proper execution of the work, this includes product data for all items listed under Part 2 - Products. Product data shall include manufacturing product data, specifications, samples and application instructions, safety data sheets (SDS), and other pertinent information as necessary.
7. Waste Disposal & Recycling Sites: Submit Name Location, Class, and EPA # for each waste disposal site to be used for any asbestos or lead wastes, PCB ballasts, Universal Wastes, other hazardous wastes or hazardous materials or substances required recycling. Include information on permitted recycling sites or firms to be used for Universal Wastes, metallic lead, and regulated reclaimed refrigerant gasses.

C. Daily Submittals: Within 72 hours following the completion of the first Work Shift for each different operation, the Contractor shall submit the following information to the Observation Service by fax or e-mail:

1. OSHA exposure monitoring sample results for asbestos including Eight (8) hour Time Weighted Average (TWA) sampling and results for asbestos excursion limit samples. Sample results must indicate the person sampled, description of work activity, start and stop times, liters per minute, total volume and laboratory result expressed as an eight-hour TWA or excursion limit sample.
2. OSHA exposure monitoring sample results for 8-hour TWA monitoring of “trigger tasks” associated with lead-related construction/demolition activities.

D. Close-Out Submittals:

1. Within 10 days of completion of all hazardous material removal work, submit a copy of all outstanding Daily Submittals and one copy of each hazardous waste manifest for asbestos, lead, and PCBs as applicable, each non-hazardous asbestos waste manifest, each Universal Waste manifest, and each refrigerant reclaiming certificate to the Observation Service.
2. Work Area entry/exit logs completed for each asbestos Work Area and each Work Shift.

1.7 Postings

A. Before the commencement of any asbestos or lead related construction work at the site, post Cal/OSHA warning signs in and around the Work Area to comply with Cal/OSHA regulations.

B. Copies of the Contractor’s SCLB license (e.g C-22), Cal/OSHA registration certificate, temporary job-site notifications, pre-start LBP notifications to Cal/OSHA, local agency notifications, emergency exit diagram, emergency phone numbers, Cal/OSHA poster on worker’s rights, and worker’s compensation poster shall be posted proximate to the entrance to each Work Area.

C. The Contractor shall have at least one copy of the Contract Documents including project plans and specifications, and a current copy of 8 CCR 1529 & 1532.1.

PART 2 - PRODUCTS

2.1 GENERAL

A. Submit manufacturer's product data for all items to be used including the items listed below. Include a SDS for each product as applicable.

B. All materials to be used on the project shall be new in original packages, containers, or bundles bearing the name of the manufacturer and the brand name. Used materials will not be permitted.

2.2 PROTECTIVE COVERING (PLASTIC SHEETING)

A. For standard containment and critical barrier usage: Polyethylene sheets 6 mil and 4 mil in sizes to minimize frequency of joints. Fire retardant polyethylene sheeting, approved and listed by the State Fire Marshall per Section 13121 and/or 13144.1 of the California Health and Safety Code, is required for all renovation projects and all abatement in occupied buildings.

2.3 TAPE, ADHESIVES, SEALANTS

A. Duct tape two inches or wider, or equivalent, capable of sealing joints of adjacent sheets of plastic sheets and for attachment of plastic sheets to finished or unfinished surfaces of dissimilar materials and capable of adhering under both dry and wet conditions.

B. Spray adhesives for sealing polyethylene to polyethylene shall contain no methylene chloride compounds.

2.4 PROTECIVE PACKAGING

A. Appropriately labeled 6 mil sealable polyethylene bags as a minimum for asbestos.

B. Appropriately labeled, impermeable drum containers with sealable lids for RCRA lead waste and PCB fluorescent light ballasts (FLBs).

C. For PCB ballasts the following protective packaging applies:

1. Clear, air and liquid tight, sealable 6 mil polyethylene bags shall be used for inner packaging of PCB FLBs for disposal in small quantities and /or for "leakers";
2. Sealable drums shall be DOT type 17 C or 17 H with tight fitting lids;
3. Absorbent materials for lab packing drums for Class I landfill shall be oil adsorbent and non-toxic;
4. Labels- all drums and shipping containers for PCB ballasts and other PCB hazardous wastes shall be labeled at minimum per below (Article 2.5 Paragraph D)

D. Bilingual labels (English and Spanish) on waste packages, contaminated material packages and other containers shall be in accordance with EPA or OSHA standards.

2.5 WARNING SIGNS AND LABELS

A. All warning signs and labels must meet all applicable regulatory requirements for wording, size of lettering, and use of language, pictographs, and graphics to effectively convey the

warning. Additional requirements apply for hazardous waste containers and shipments for transportation to disposal sites.

B. Asbestos Warning signs for Regulated Areas must contain the following wording:

DANGER
ASBESTOS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
AUTHORIZED PERSONNEL ONLY
WEAR RESPIRATORY PROTECTION AND PROTECTIVE
CLOTHING IN THIS AREA

C. Labels for packaging and containers containing ACM waste (friable and non-friable) must contain the following wording:

DANGER
CONTAINS ASBESTO FIBERS
MAY CAUSE CANCER
CAUSES DAMAGE TO LUNGS
DO NOT BREATH DUST
AVOID CREATING DUST

D. Labels for drums and shipping containers for PCB ballasts and other PCB hazardous wastes shall be at minimum as follows:

1. Yellow PCB caution label with the following information:

CAUTION
CONTAINS PCBs
(Polychlorinated Biphenyls)

A toxic environmental contaminant requiring special handling and disposal in according with U. S. Environmental Protection Agency Regulations 40 CFR 761 – For Disposal Information Contact the nearest U.S. E. P. A. Office.

In case of accident or spill, call toll free the U.S. Coast Guard National Response Center: 800 - 424 – 8802

Also Contact: _____
Telephone Number: _____

2. Shipping Label containing the following information:
   a. RQ, Polychlorinated Biphenyls, 9, UN 2315 , PG
   b. Name and address of generator
   c. Date Removed
   d. Contents: (e.g. PCB lighting ballasts)
   e. Waste manifest number

E. Lead Warning signs for Regulated Areas where exposure is known or anticipated to exceed the PEL must contain the following wording:

DANGER
LEAD WORK AREA
MAY DAMAGE FERTILITY OR THE UNBORN CHILD
CAUSES DAMAGE TO THE CENTRAL NERVOUS SYSTEM
DO NOT EAT, DRINK, OR SMOKE IN THIS AREA

2.6 SURFACTANT

A. Surfactant, or wetting agent, for amending water to ensure asbestos is adequately wet during asbestos removal and subsequent waste handling, packaging/containerizing for disposal. Products such as Fiberlock “Penewet”, Foster 32-90 Asbestos Removal Surfactant, or equivalent products are acceptable for this purpose.

2.7 PERSONAL PROTECIVE EQUIPMENT

A. Personal Protective Equipment shall comply with the requirements of 29 CFR 1910, Subpart 1 and 8CCR 1514, 1515, 1516, and 1517.

B. Asbestos abatement and lead-related work clothes shall consist of impervious disposable, full-body coveralls, head covers, boots, rubber gloves, and work boots (or sneakers). Sleeves at wrists and cuffs at ankles shall be secure. Disposable coveralls shall be a non-see through type and constructed of DuPont Tyvek, Kimberly-Clark KleenGuard A40 or equivalent fabrics that provide acceptable protection from asbestos and other toxic particulate penetration. Protective clothing for other hazardous must be impervious to those chemical hazards.

C. Eye protection and hard hats shall be available and worn when required by applicable safety regulations.

D. Provide Authorized Visitors with suitable protection clothing, headgear, eye protection, and footwear whenever they enter the Work Area.

2.8 RESPIRATORS

A. Provide all workers, foremen, superintendents, authorized visitors, and inspectors with personally-issued and marked, clean and sanitized respiratory equipment approved by NIOSH. When respirators with disposable filters are employed, provide sufficient filters for replacement as recommended by manufacturers or this specification. Selection of respirators shall be made according to the Cal/OSHA respirator standard and applicable hazard specific regulation.

B. The minimum respiratory protection for asbestos abatement for this project is a half mask respirator as long as the airborne levels do not exceed one tenth of the PEL (e.g. 0.01 f/cc). For other airborne chemical hazards, respirator protection shall selected to ensure protection to below established the Action Level (AL) established by regulation or otherwise 1/2 of the applicable PEL in the absence of an AL.

PART 3 - EXECUTION

3.1 PROJECT PROCEDURES

A. Prior to the start of on-site work, the Contractor shall hold an on-site start-up safety meeting for all of contractor and facility employees that addresses at least the following issues specific for the project:

1. Safety and health hazards;
2. Procedures and work practices;
3. Respiratory protection and instruction;
4. Special conditions and/or work requirements.

B. Worker Protection Procedures (Asbestos, Lead, PCB's, and other hazardous material/substance impacted by project.

C. Provide Authorized Visitors with suitable protective clothing, respirators, headgear, eye protection, and footwear whenever they are required to enter the Work Area. All provided equipment shall be new or in good working condition

3.2 GENERAL WORK AREA PREPARATION FOR ABATEMENT

A. General Requirements

1. Isolate, effectively protect, or de-energize electrical power to Work Area. Electrical circuits shall be deactivated if they do not include ground fault circuit interrupters.
2. Provide temporary power and lighting and ensure safe installation of temporary power sources and equipment per applicable electrical code requirements and provide ground fault interrupter circuits with power source for electrical equipment to be used.
3. Provide temporary supply of water adequate for wet removal, cleaning, decontamination and operation of employee shower system (where required).
4. Isolate any heating, cooling, ventilation air systems that enter or penetrate the building within or near the Work Area to prevent contamination of other areas of the structure.
5. Cordon off all other accesses to interior Work Areas with barrier tape and warning signage.
6. Seal all remaining openings to interior Work Area, including but not limited to ducts, grills, diffusers, and any other penetrations of the Work Area, with critical barriers consisting of two layers of plastic sheeting sealed with tape.
7. Isolate non-emergency egress doorways, and access ways with temporary barriers and seal with plastic sheeting.
8. Clean and remove movable objects, furniture and equipment.
9. Pre-clean work area using wet cleaning and/or HEPA vacuuming to remove all visible dust and debris prior to starting hazardous material removal or major disturbance work.
10. Cover and seal non-movable objects, furniture and equipment not being abated

3.3 PREPARATION FOR CLASS I & II ASBESTOS WORK

A. Class I & II Asbestos Removal Work:

1. In addition to general preparation requirements (above):

   a. Install negative pressure enclosure (NPE) containment or negative pressure mini-containments using HEPA filtered exhaust systems ducted to the exterior. HEPA systems must be tested on site prior to use to verify HEPA efficiency is achieved by equipment as installed.

   b. Establish a negative pressure differential of at least -.02 inches of water with respect to the exterior of the containment and ensure at least 4 air changes per hour are achieved. The negative pressure shall be monitored using an installed and properly calibrated manometry equipment with a recording strip chart to verify and document compliance. Maintain negative pressure throughout removal and clean-up operation until a successful final clearance has be obtained.

   c. Each NPE or mini-containment shall be inspected and smoke tested leaks by the Contractor's Competent Person in coordination with the Observation Service prior to use. The Observation Service may conduct additional inspection and testing prior to start up.

   d. Where glove bags are used, they shall be inside a Regulated Area isolated with critical barriers and used with a drop sheet below for additional protection. Alternatively cover walls, flooring, and other exposed surfaces to remain with at least one layer of plastic sheeting.

   e. Install a negative pressure monitoring system for continuous monitoring except were removal is also contained in a glove bag.

   f. Install a contiguous three stage decontamination (Decon) unit. Exceptions: for glove bag removals a Decon Area may be set up; mini-containments, if used, shall have at least a two stage decontamination unit; and where a contiguous decontamination unit is not feasible, establish a remote Decon unit on site with a shower and provide a double suiting or re-suiting procedure for egress from the Work Area containment in non-contaminated work clothing.

   g. Alternate containment systems and procedures may be used for exterior work (roof, utility trenches, etc.) subject to approval by the Owner's Observation Service.

3.4 PREPARATION FOR LEAD-PAINT DISTURBANCE WORK

A. In addition to the general preparation requirements (above):

1. Pre-clean Work Area of any visible paint chips and debris.
2. Install drop cloth that extends at least five feet beyond area of disturbance to contain and collect lead contaminated paint chips, dust, and debris.
3. Clean and decontaminate Work Area prior to end of shift and place all waste in tightly sealed labeled waste containers.
4. Remove all waste containers and place in secure storage pending disposal.

3.5 ASBESTOS REMOVAL AND DISTURBANCE PROCEDURES

A. Prohibitions. The following methods shall not be used to remove or clean up asbestos:

1. Use of high speed abrasive disc saws without effective HEPA filtered attachments;
2. Compressed air to remove or clean-up asbestos;
3. Dry sweeping or shoveling of asbestos containing dust or debris;
4. Aggressive removal methods where non-aggressive methods are feasible. Where aggressive methods are required, they must include special containment and control procedures acceptable to regulatory agencies and approved by the Observation Service in advance.

B. Gross Removal and Clean-up of ACM (e.g. TSI and Surfacing ACM).

1. Use full negative pressure enclosure (NPE) and containment procedures with HEPA exhaust to the building exterior.
2. Wet ACM to be removed with amended water and continue wetting during removal process.
3. Place adequately wetted and removed materials promptly in labeled waste disposal bags or containers as it is removed.
4. Close and seal bags and containers as they are filled. Plastic waste bags are to be sealed using the “goose neck” technique by twisting the neck of the bag, bending it over, and taping it with multiple wraps of tape.
5. Clean exterior bags surfaces by wet wiping and double bag asbestos waste in the Equipment Room prior to waste load out and placement is secure asbestos waste storage bins or equivalent.

C. Glove Bag Technique (ACM pipe & fitting TSI)

1. Follow the General and Class I Preparation Steps as indicated above.
2. Install glovebags in accordance with manufacturer instruction and regulation. Smoke test prior to use.
3. Wrap any loose and friable ACM adjacent to and at the glove bag installation location with two layers of six mil plastic sheeting.
4. At least two qualified workers are to perform all Class I glovebag operations.
5. Thoroughly wet TSI with amended water prior to and during removal operation to saturate the ACM. Any insulation to remain shall be cut clean to form a smooth clean edge 6” back from the original end of the insulation. Thoroughly clean the pipe and/or fitting and the inside of the glove bag.
6. Encapsulate all surfaces inside the glove bag; seal raw ends of insulation to remain with lagging cloth and sealant; evacuate the bag with a HEPA vacuum; tie off the waste bag section; remove all tools from bag; remove the bag from the pipe, folding the side of the bag inward; then twist and tape the open end, the wand opening and the vacuum opening.
7. Place the removed glove bag in another six mil labeled asbestos waste bag and seal air tight.
8. Place all asbestos contaminated wastes in a secure waste storage area in a labeled drum or container pending disposal.

D. Cut, Wrap, and Remove Technique

1. This technique may be used if the ACM insulated pipe is to be demolished;
2. Wrap the pipe to be removed with two layers of 6 mil plastic sheeting and seal with duct tape and apply asbestos warning labels.
3. Install glove bags on wrapped pipe at locations to be cut to provide manageable lengths of pipe for removal and disposal. Remove insulation using the glove bag technique and seal insulation near ends of pipe section to be removed with two layer of plastic sheeting and duct tape.
4. Clean up dust and debris using HEPA vacuum and wet wiping materials.
5. Place all asbestos contaminated dust, debris and cleaning materials in a labeled waste bag or container for disposal. Store containerized asbestos waste in a secure area pending shipment for disposal.

3.6 CLASS II ASBESTOS REMOVAL OPERATIONS

A. Prepare Work Area as indicated above for Class II Operations

B. Removal of Gypboard with ACM joint compound and/or ACM texture compounds

1. Mist the gypsum board, taping compound, and texture compounds continuously with amended water during removal operations;
2. Remove in as intact manageable large sections to extent feasible using utility knives and pry bars and other appropriate tools to removal wallboard system from framing. Use claw hammers as necessary to remove fasteners.
3. Place removed wallboard and associated debris in asbestos labeled waste bags or containers. Wet removed ACM contaminated materials with amended water as it is removed and packaged. Include potentially contaminated wall insulation in the ACM waste bags or containers.
4. Complete removal and clean up by cleaning or removing all nails and fasteners, cleaning all junction boxes, conduit, wire, outlets, plumbing, framing and other surfaces in the work area.

C. Removal of Non-friable ACM Roofing Sealants, Mastics, &Tars

1. Entire roof may serve as the Regulated Area with warning signage are point of roof access;
2. Use wet methods (where safe) and remove intact to extent feasible;
3. Use manual cutting and prying tools to remove intact;
4. Do not allow ACM roofing materials or mastics to fall off roof during removal;
5. HEPA vacuum or wet wipe any resulting dust and/or debris;
6. Place in labeled bags or containers and lower to ground carefully by end of shift.

D. Removal on Non-Friable Exterior ACM Caulking, Sealants, and Window Glazing Compounds

1. Establish a Regulated Area with warning signage and a drop sheet below the removal that extends from the building wall or foundation to at least 5 feet beyond the removal location.

2. Use wet methods and removal the ACM intact as feasible placing removed ACM directly into labeled waste bags or containers.
3. Window putty may be removed with the entire window if the windows are to be demolished. Entire window must be double bagged or wrapped in 6 mil plastic and labeled with asbestos warning labels.

E. Asbestos Cement (AC) Pipe/Conduit Excavation, Cutting, Tapping, & Removal

1. Carefully machine excavate to expose AC piping and conduit as necessary. Once exposed manually excavate areas to prevent breakage where cuts, breaks, or taps are to be made;
2. Establish a Regulated Area surrounding the location of cutting, tapping, and, or removal using barrier tape and signage at minimum;
3. Place plastic sheeting below area to be cut or altered to catch any resulting ACM chips, dust or debris;
4. Use methods and procedures to cut AC pipe/conduit without causing it to shatter, crumble, be pulverized or release visible dust into the air;
5. Keep AC pipe and conduit wetted during all cutting and tapping work;
6. Use only industry recommended practices for cutting, splicing, and tapping AC pipe. At minimum:
   a. Cutting is to be completed by special carbide tipped blade cutters that are frame adjustable to the circumference of the pipe and that have self-tracking rollers or “snap cutters” that operate with cutting wheels on a chain wrapper around the pipe barrow;
   b. Machining, if necessary, shall be conducted wet using manual field lathe or manual rasp;
   c. Tapping, whether under pressure or on non-pressured lines, shall be conducted wet and include provisions for internal pipe cleaning by flushing, purging, or other means to prevent asbestos dust and chips from entering the drinking water system.
   d. Do not blow out with compressed air or dry sweep. Do not vacuum without a HEPA filtered vacuum; &
   e. All cutting, machining, tapping procedures must be conducted wet and all resulting AC dust and debris must be cleaned up and disposed of as ACM contaminated waste.
7. Piping sections to be demolished shall be carefully cut into manageable sections, wrapped and sealed in plastic sheeting, labeled, and carefully placed in labeled and lined asbestos waste disposal bin;
8. All intact AC pipe waste and debris shall be disposed of as non-hazardous asbestos waste transported by non-hazardous asbestos waste manifest to a permitted asbestos disposal site.

3.7 FINAL ASBESTOS DECONTAMINATION

A. Previous Work: During completion of the asbestos removal and visible debris clean up work specified, the first cleaning of all exposed equipment and building surfaces must be completed.

B. Clean any remaining materials and debris exposed by the protective barrier removal. All critical isolation barriers, vents, grilles, diffusers, etc., shall remain in place in interior containments and Regulated Areas;

C. Clean all exposed surfaces in the Work Area containment or Regulated Area by wet wiping and HEPA vacuuming.

D. At the completion of this cleaning phase, the Work Area shall be free of all unnecessary equipment/materials and waste containers.

E. The Contractor's Competent Person/Supervisor shall perform a complete visual inspection of the Work Area under adequate lighting to ensure that the Work Area is free of visible asbestos material, debris, and dust.

F. Notify the Owner's Observation Service at least 48 hours in advance of the day and time when the Work Area will be ready for Final Inspection and Clearance.

G. The Contractor's Competent Person/Supervisor shall ensure that additional cleaning is completed if the area is not acceptably clean. The Contractor shall request a final visual inspection by the Observation Service once the Competent Person/Supervisor concludes that the area is acceptable for final visual inspection.

H. After written notification to proceed from the Observation Service, encapsulate all surfaces within the Work Area.

I. After written notification from the Observation Service that the abatement was fully completed and successfully decontaminated based on clearance inspection and testing, the Contactor may proceed with removal of critical barriers and containment materials.

3.8 LEAD-RELATED DEMOLITION

A. General. All painted or coated surfaces at this site are known or presumed to contain lead subject to worker protection and environmental regulations. Refer to referenced survey documents and hazardous materials plans for additional information including components with LBP requiring agency notification.

B. Establish a Regulated Area for lead-related building demolition.

C. Conduct demolition work in a manner that does not result in site contamination above background levels. Use wet methods for dust suppression during demolition.

D. Clean up any demolition-related lead wastes including any resulting paint chips and debris.

E. The Contractor shall evaluate each demolition debris waste stream and ensure proper disposal of all generated wastes. All waste profiling and testing required by the disposal site is the responsibility of the Contractor.

3.9 LEAD WASTE CLEAN UP AND EVALUATION

A. Clean up paint chips and debris using wet cleaning methods and HEPA vacuuming. All surfaces shall be free of all visible paint chips, dust and debris. Place all paint chips in a labeled waste bag or container.

B. Place all contaminated cleaning materials, disposal personal protective equipment (PPE) and contaminated plastic in separate waste bags. The Contactor shall assume all lead-related waste is RCRA hazardous waste and shall conduct required waste testing as necessary for disposal at a permitted waste disposal site.

C. All waste streams and waste categories listed below shall be considered potentially lead hazardous waste until proven otherwise through testing. All testing of demolition waste wastes is the responsibility of the Contractor. The Contractor shall be responsible for segregating suspect lead hazardous waste based on potential for exhibiting hazardous waste characteristics. Lead-related wastes are to be segregated into the below listed categories at a minimum.

1. Category I: LBP/LCP paint chips, vacuum bags, used cleaning materials. These materials are typically hazardous wastes.
2. Category II: Plastic sheeting and tape, disposable clothing, and equipment. These materials should be non-hazardous if properly cleaned and decontaminated. However, these items are to be considered hazardous subject to testing.
3. Category III: For general structural building demolition, the demolition debris will typically be non-hazardous if the vast bulk of the waste materials are non-lead containing materials (lumber, brick, cement, etc.). For selective demolition of LBP finishes and high lead content ceramic tile, the waste stream is likely to be hazardous unless proven otherwise by testing.

D. Based on the testing protocols, any waste greater than or equal to five (5) ppm lead using the STLC test or any waste greater than or equal to 1000 ppm lead using the TTLC test shall be considered a California hazardous waste. Any waste greater than 5 ppm based on the federal TCLP test is an RCRA hazardous lead waste.

E. When the TTLC test result is less than 50 ppm lead, no further testing is required for that waste category sampled unless the waste stream or waste generating process changes.

3.10 PCB BALLASTS & UNIVERSAL WASTES

A. Each fluorescent light ballast associated with a light fixture to be demolished shall be inspected for labeling. Any non-electronic ballast not labeled “PCB Free” or “No PCB” shall be considered a PCB ballast and properly packaged and disposed of as a hazardous waste.

B. Carefully remove all fluorescent lighting tubes or lamps and high intensity lamps. Package for disposal as a universal waste at a permitted recycling and/or disposal site.

C. Emergency and exit lighting batteries must be removed, packaged and disposed of as a Universal Waste.

3.11 REMOVAL AND RECYCLING OF OZONE DEPLETING COOLANT GASSES

A. All air conditioning units, refrigerators, refrigerated drinking water fountains, and other equipment with coolant gasses shall be assumed to contain regulated chlorofluorocarbon (CFC) and/or HCFC gasses subject to federal and state regulation pertaining to containment and recycling of the gasses.

B. Use only properly EPA certified Refrigerant Reclaimers to remove CFC or HCFC from equipment to be demolished and scrapped.

C. Remove CFC & HCFC gasses using approved equipment and methods which prevent escape to the atmosphere and recycle removed gasses in accordance with applicable federal and state regulation.

D. Removed refrigerant gasses must be recycled or destroyed per regulation.

3.12 IONIZATION TECHNOLOGY SMOKE DETECTORS

A. Assume all smoke detectors are of ionization technology type with radioactive sources (Americium 241) unless visual inspection of each unit indicates otherwise. Ionization technology smoke detectors are typically indicated with an “I” or the word “ionization” on the front or back side of the detector. Photoelectric smoke detectors do not contain radioactive materials and are indicated with a “P” or the work “photoelectric”.

B. Inspect each smoke detector and determine if it is of “ionization” type or “photoelectric” type.

C. Photoelectric Technology Smoke Detectors. Remove the smoke detector batteries and dispose of photoelectric type smoke detectors as construction trash.

D. Ionization Technology Smoke Detectors (with radioactive material sources): Remove the battery and dispose of the ionization type smoke detector in accordance with federal, state and local regulation. Some smoke detector manufacturers will accept spent smoke detectors they manufactured; some hazardous waste collection centers will accept ionization type smoke detectors, and there is one recycling company that accepts spent ionization type detectors (Curie Environmental Services). It is the Contractor’s responsibility to properly identify, remove and dispose of all ionization smoke detectors.

3.13 WASTE PACKAGING & LABELING

A. All asbestos wastes shall be adequately wetted prior to packaging.

B. Place asbestos waste in six (6) mil labeled asbestos waste bags or approved equivalent containers.

C. Goose neck and seal each bag and place in a second clean-labeled bag, drum or impervious container.

D. Decontaminate waste bags and containers prior to removing from regulated or contained area.

E. Label all asbestos waste bags or containers with OSHA warning label and other information as required by regulation.

F. All other hazardous wastes including lead, PCB, and universal wastes shall be properly labeled and containerized in leak tight containers.

3.14 WASTE DISPOSAL

A. Waste Transportation: Submit the method of transport of hazardous asbestos wastes including name, address, EPA ID number, and telephone number of transporter.

B. Waste Disposal Site(s): Submit for approval the name, class, address, EPA ID number, and telephone number of waste disposal site(s) to be utilized.

C. Waste Manifest: Submit for approval at the Pre-construction meeting a filled out Waste Manifest form. For Waste Manifest purposes, the Generator is the facility of the subject work.

1. Obtain necessary information including generator EPA number for this purpose from the Owner or Owner's Representative prior to start up of any abatement or demolition.
2. After removal and packaging waste for shipment, provide a copy of the Waste Manifest to the Observation Service for each required shipment.
3. Use the Uniform Hazardous Waste Manifest for hazardous wastes including lead and asbestos. Include a properly completed Land Disposal Restriction Notice and Certification form with each manifest submitted for signature by the generator (Owner).
4. Use a non-hazardous wastes manifest for disposal of non-friable asbestos wastes.

D. Each hazardous waste manifest and each non-hazardous asbestos waste manifest shall be prepared for the Owner or Owner's Representative's review and approval prior to shipment.

E. The sealed hazardous waste containers shall be delivered to the Contractor's pre-designated, approved hazardous waste treatment and waste disposal site for treatment, destruction, and/or burial in accordance with applicable state and federal regulations. Likewise, non-hazardous asbestos waste shall be delivered under manifest to a permitted asbestos waste disposal site.

F. Notify the Owner's facility representative 48 hours in advance of the time when contaminated materials are to be removed and transported from the site to allow for manifest review and approval.

G. The Contractor shall be responsible for safe handling and transportation of all hazardous waste generated by this Contract to the designated Hazardous Waste Site and shall hold the Owner and the Owner's agents and consultants harmless for claims, damages, losses, and expenses against the Owner, including attorney's fees arising out of our resulting from asbestos and hazardous materials spills on the site or en route to the disposal site.

3.15 AIR MONITORING & CLEARANCE TESTING

A. Area Air Monitoring.

1. Throughout the asbestos removal or disturbance process, area air monitoring may be conducted by the Observation Service to ensure work is done in conformance with the fiber concentration limits of these specifications. Likewise, lead removal work areas may be visually inspected and/or air monitored during disturbance activities including removal, treatment or demolition.
2. If results of area air monitoring outside the Work Area are in excess of 0.01 f/cc for asbestos regulated work areas or 0.45 micrograms of airborne lead per cubic meter of air for lead demolition area perimeters or fence line, the Contractor shall make changes in work procedures to assure compliance with minimum standards. At a minimum, the

Contractor shall stop all work and implement additional remedial controls and conduct decontamination as necessary in response to exceeding these limits.

3. Unsatisfactory asbestos results are fiber counts in excess of 0.01 f/cc by PCM Method NIOSH 7400 determined as a TWA outside the Work Area by general air monitoring. All results greater than 0.01 f/cc shall be subject to further laboratory analysis by the TEM method at the Contractor's sole expense.

B. Clearance Testing

1. Asbestos Removal or Disturbance. When all work including decontamination of a specific asbestos removal work area is complete, the Owner's Observation Service shall conduct clearance testing prior to containment removal and opening the area to un-restricted access. In order to facilitate clearance inspection and testing, the Contractor is obligated to provide at least 48 hours notice to allow scheduling of the Owner's Observation Service.

   a. Clearance Testing shall meet AHERA clearance standards for Class I or II removal work and shall include at minimum a set of five PCM samples and results for each sample less than 0.01 fibers per cubic centimeter of air. If TEM samples are requested and paid for by the Contractor, the acceptable clearance results is an average of less than 70 asbestos structures per square millimeter of filter areas.

   b. Failed clearance results shall results in the Contractor re-cleaning and encapsulating the Work Area and paying for any additional clearance testing costs including consultant labor and analytical costs.

2. Lead Demolition or significant disturbance (>2 square feet/work area) of lead-based paint (LBP). After all removal/disturbance work is completed and the work area has been decontaminated by wet cleaning and HEPA vacuuming, the Owner's Observation Service may require or conduct lead wipe testing of surfaces prior to release of the areas for unrestricted use. Lead contamination of floors and other horizontal surfaces shall be less than 40 micrograms of lead per square foot based on lead wipe sampling.

3.16 CLOSE-OUT

A. All submittal and punch list items must be complete and provided to the Observation Service.

END OF SECTION