# SECTION 13281
# HAZARDOUS MATERIALS MANAGEMENT – LEAD & OTHER HAZARDOUS MATERIALS

## PART 1 - GENERAL

### 1.1 SCOPE OF WORK

#### A. WORK INCLUDED - GENERAL

1. The Contractor shall furnish all labor, material, equipment, services, testing, employee training, respirator fit testing, medical exams, transportation, and daily expense to meet the requirements of this Specification.
2. The Contractor shall obtain all required permits, licenses, registrations, notifications, and regulatory approvals required by law (federal, state and local) and University of California Davis Medical Center (UCDMC) policy.
3. All lead-related activities associated with this Contract shall be performed during the work period specified in each contract.
4. The Contractor shall guard against unnecessary disturbances or damage to sensitive finishes on buildings, building systems, and equipment.

#### B. WORK INCLUDED – SPECIFIC

1. The Contractor is responsible for identifying the exact locations and number of work areas listed below by referring to University supplied Project Drawings and by working with the University's Representative or University's Hazardous Materials Consultant.
2. This project includes work on building components that are known to contain lead, specifically lead lined walls, cabinets, and doors. This project is a renovation project and not considered a lead abatement project with regards to the requirements of Title 17. Cal/OSHA Title 8 1532.1 Lead in Construction worker health and safety regulations apply.

### 1.2 SITE CHARACTERIZATION

No testing of materials was conducted for this project, since some of walls, doors and Biodex cabinets are known to contain lead sheeting.

| Building Component | Substrate | Color | Test Location |
|---|---|---|---|
| Lead Lined Walls | Gypsum | N/A | See Drawings |
| Lead Lined Biodex Cabinets | Unknown | N/A | See Drawings |
| Lead Lined Doors | Unknown | N/A | See Drawings |

A. Hazardous materials, other than lead sheeting or lining that have the potential to be disturbed at this Project site are listed in the table below:

| *Material Description* | *Type of Hazard* | Location |
|---|---|---|
| Fluorescent Light Bulbs | Mercury | See Drawings |
| Light Ballasts | Universal Waste | See Drawings |
| Mold Contamination | Mold | Possible minor amounts at base of walls from housekeeping activities |

B. Where light fixtures are required to be removed, the Contractor shall recycle all fluorescent light tubes and non-PCB containing ballasts as Universal Wastes as required in Title 22. Packaging of light tubes and light ballasts shall be in accordance with regulatory standards for safe storage and transport by a hazardous waste hauler.

C. Prior to handling other hazardous materials at the Project site, the Contractor shall review University's protocols with a UCDHS EH&S Representative.

1.3 ABBREVIATIONS AND DEFINITIONS

A. Abbreviation

| | |
|---|---|
| AA | Atomic Absorption – Flame (EPA SW-846) |
| ABATEMENT | Removal of all Lead in the Building/Location or Specific Component |
| AIHA | American Industrial Hygiene Association |
| AL | Action Level (2 $\mu g/M^3$ per 8 hour TWA) |
| BLL | Blood Lead Level |
| CCR | California Code of Regulations |
| CDPH | California Department of Public Health |
| CEPA | California Environmental Protection Agency |
| CFR | Code of Federal Regulations |
| CSLB | Contractor's State Licensing Board |
| DIR | Division of Industrial Relations |
| dL | Deciliter |
| DOSH | Division of Occupational Safety and Health |
| DOT | Federal Department of Transportation |
| DTSC | California Department of Toxic Substances Control |
| EH&S | Environmental Health and Safety - UCDHS |
| ELLAP | Environmental Lead Laboratory Accreditation Program |
| ELPAT | Environmental Lead Proficiency Analytical Testing Program |
| EPA | U.S. Environmental Protection Agency |
| FVC | Forced Vital Capacity |
| FEV | Forced Expiratory Volume |
| GFCI | Ground Fault Circuit Interrupter |
| HEPA | High Efficiency Particulate Air |
| HUD | U.S. Department of Housing and Urban Development |
| HVAC | Heating, Ventilation, and Air Conditioning |
| ICRA | Infection Control Risk Assessment |
| INTERIM CONTROLS | Removal at specific locations to accommodate remodel < 20 years |
| LBP | Lead Based Paint (paints, varnish, shellac, etc. >0.5% lead by weight, >5,000 ppm, or > 1.0 $mg/cm^2$) |

| | |
|---|---|
| LCM | Lead Containing Material – materials tested to contain any measurable levels of lead |
| μg | Microgram = part per billion (ppb) |
| SDS | Safety Data Sheet |
| NAAQS | National Ambient Air Quality Standards |
| NAM | Negative Air Machine |
| NESHAP | National Emissions Standard for Hazardous Air Pollutants |
| NFPA | National Fire Protection Association |
| NPE | Negative Pressure Enclosure |
| NVLAP | National Voluntary Laboratory Accreditation Program |
| O&M | Operations and Maintenance |
| OSHA | Federal Occupational Safety and Health Administration |
| PEL | Permissible Exposure Limit (10 μg/$M^3$ 8 hr. TWA) |
| PLCM | Presumed Lead Containing Material |
| PPE | Personal Protective Equipment |
| RCRA | Resource Conservation and Recovery Act |
| TCLP | Toxicity Characteristic Leaching Procedure (mg/L) |
| TTLC | Total Threshold Limit Concentration (wet-weight mg/kg) |
| TSP | Trisodium Phosphate |
| TWA | Time Weighted Average |
| STLC | Soluble Threshold Limit Concentration (mg/L) |
| UCDHS | UC Davis Health System |
| ULPA | Ultra Low Penetrating Air |
| XRF | X-ray Fluorescence |
| ZPP | Zinc Protoporphyrin |

B. Definitions: The following definitions are provided for additional clarification and may exceed Federal, State or local regulatory requirements.

1. Lead Abatement - “Abatement” means any set of measures designed to reduce or eliminate lead hazards or lead-based paint for public and residential buildings but does not include containment or cleaning.

1.4 SUBMITTALS

A. Submit in accordance with Section 01 33 23 Shop Drawings, Product Data and Samples, and Section 01 77 00 Closeout Procedures.

B. Submit proposed material substitutions complying with requirements listed in Section 01 60 00 Product Requirements.

C. References: Submit names, addresses and telephone numbers of Project Managers or Owners (not employed by Contractor) for whom Contractor has performed jobs of similar size and character to the work specified in this Contract.

D. General: Submittal requirements listed below shall be completed and accepted by University’s Representative prior to scheduling the start of project site work. Work shall not begin until such approval has been given, and a bound copy of project submittal is placed at an easily accessible location at the project site.

E. Notifications and Permits: Submit copies of all regulatory agency notifications and permits.

1. Contractor is required to submit a “Lead-Work Pre-Job Notification” (8 CCR 1532.1(p)) for all projects, if there is greater than 100 square feet or greater than 100 linear feet of materials containing lead greater than 5,000 ppm, 0.5% by

weight, or 1.0 mg/cm$^2$ to be removed. If these quantities are exceeded, a copy of the notification to Cal/OSHA shall be provided to the UCDHS EH&S Representative.

2. Since more than 100 square feet of lead line building components that will be removed on this project, written notification to Cal/OSHA is required.

F. Worker Training and Safety Programs

1. Training Certificates: For each employee who will be employed on the Project, submit a copy of employee's lead training that meets Cal/OSHA training requirements under Title 8 Section 1532.1 Lead in Construction. Based on the work being performed involving removal of lead lined gypsum walls, at a minimum, lead awareness training is required for this project.
2. Qualifications of person taking Personal Air Samples: Submit information regarding training and qualifications of the field technician who will be collecting personal air samples.

G. Safety Programs: On company letterhead, submit confirmation that the Contractor has written safety programs for:

1. Injury Illness Prevention (T8 CCR 3203) (mandatory for all projects),

2. Hazard Communication (T8 CCR 5194) (mandatory for all projects),

3. Fall Protection (T8 CCR 1620 – 1621, 1632 – 1633, 1635.1 – 1637, 1640 – 1655, 1669 – 1672, 3209 - 3239) (when applicable),

4. Lock Out Tag Out (T8 CCR 3314) (when applicable),

5. Confined Space (T8 CCR 5156) (when applicable).

6. Respiratory Protection (8 CCR 5144) (when applicable)

7. Medical Surveillance (8 CCR 1532.1(i)) (when applicable)

8. Lead Compliance (8 CCR 1532.1(e)(2)) (when applicable)

H. Work Plan and Schedule: Submit proposed Work Plan and schedule. The Work Plan shall be project specific and address project site preparation, site and engineering controls, worker protection and exposure monitoring, and protection of building occupants from exposure to lead. Schedule of work must be submitted and approved before work begins. University's Representative will forward a copy to the Hazardous Material Consultant for review prior to commencement of work.

I. Product Data Sheets and Safety Data Sheets (SDS): For all products proposed for use on the project, submit copies of the manufacturers' safety data sheets to the UCDHS EH&S Representative for review, and copies of the Product Data Sheets to the University Representative for review.

J. Laboratory Qualifications: For any laboratory performing lead analysis the Contractor shall submit evidence of ELLAP and ELPAT certification and accreditation. Laboratories performing worker exposure sample analysis must submit evidence of AIHA IHLAP certification for metals if they do not have ELLAP or ELPAT certification.

K. HEPA/ULPA Equipment Test: Submit copies of leak test (DOP tests) results to the University's Representative prior to starting project site work. Leak testing shall be performed at the project site and shall be witnessed by the UCDHS EH&S Representative or the Hazardous Materials Consultant. The leak test results shall identify equipment by make, model and serial number. No equipment which fails the leak testing may be used at UCDHS, unless it is exclusively exhausts outdoors. Vacuums which fail may be used within full negative pressure enclosures at the discretion of UCDHS EH&S.

L. Emergency Contact List: Submit an emergency contact list; include name, phone number, fax number and pager number for Contractor's supervisor or competent person and subcontractor's telephone numbers who can be reached on a 24-hour basis.

M. Hazardous Waste Disposal Plan: Submit a Waste Disposal Plan that includes estimated number of containers), size of container(s), hazardous material transporter name and proposed disposal site or the recycling company before start of project. The disposal facility and recycling company shall be approved by the UCDHS EH&S representative prior to off-haul.

N. Lead As-Built Summary: Submit a Lead As-Built Summary within 14 calendar days of the last day of field Work and prior to a request for final application for payment. The summary shall include a description of lead containing materials that were removed and a description of lead containing materials that remain in the project area.

1.5 CONTRACTOR QUALIFICATIONS

A. Contractor licensing for this work will require a B, C33, or C61/D-38 and appropriate lead training for employees to perform lead-related work.

1.6 RULES AND REGULATIONS

A. The Contractor shall comply with the most recent edition of applicable Federal, State, local, and University standards, laws, codes and regulations. If a conflict exists between referenced regulatory requirements and Contract Documents, the Contractor shall notify the University's Representative in writing and request the conflict be resolved. Contractor performing work contrary to mandated laws shall bear full legal and financial responsibility for the violations.

B. The list of regulators and regulations, cited below, serve as a reference for the most commonly used standards governing the lead industry:

1. FEDERAL REGULATORS AND REGULATIONS
   a. EPA - Environmental Protection Agency
      (1) 40 CFR Part 261 et al. - Resource Conservation and Recovery Act
      (2) Title X - Residential Lead Poisoning Prevention Act
      (3) National Ambient Air Quality Standards (40 CFR 50)
   b. OSHA - Occupational Safety and Health Administration
      (1) 29 CFR 1926.62 - Construction Lead Standard
      (2) 29 CFR 1910.1025 - General Industry Lead Standard
      (3) 29 CFR 1910.147 - Lock Out - Tag Out
   c. DOT - Department of Transportation
      (1) 49 CFR Parts 173, 178 and 179
2. STATE REGULATORS, LAWS AND REGULATIONS
   a. Cal/OSHA - California Division of Occupational Safety and Health
      (1) 8 CCR 1532.1 - Construction Lead Standard

(2) 8 CCR 5216 - General Industry Lead Standard
(3) 8 CCR 5194 - Hazard Communication
(4) 8 CCR 5157 - Confined Space
(5) 8 CCR 5144 – Respiratory Protection
(6) 8 CCR 3203 - Injury and Illness Prevention

b. DTSC - Department of Toxic Substances Control
(1) (Health and Safety Code Chapter 6.5 Hazardous Waste Control, Article 6 Transportation and Article 6.5 Hazardous Waste Haulers
(2) CCR, Title 22, Division 4, Sections 66000, et al.

c. CIWMB - California Integrated Waste Management Board

d. California Department of Public Health (CDPH)
(1) CCR, Title 17, Division 1, Chapter 8

e. SWRCB State Water Resources Control Board – CCR, Title 23

f. CSLB - California Contractors State License Board

g. Health and Safety Code 25157.8 (AB 2784 Natural Resources)

1.7 NOTIFICATION AND PERMITS

A. The Contractor is responsible for notifying Federal, State and local agencies, obtaining all required permits/extensions and paying all related fees, as required.

B. UC Davis Health System

1. To obtain a Hot Work Permit from the UCDHS Fire Protection Office, call 916-734-3036 for instructions.
2. A Uniform Hazardous Waste Manifest shall be prepared by the Contractor or the transporter and approved by UCDHS EH&S for each load of hazardous waste transported from the work site. EH&S must notified at least 48 hours prior to the anticipated time of shipment for waste materials and for recycled materials.
3. Copies of records of non-hazardous waste removed from the project shall be provided to UCDHS EH&S, which may include Bill of Lading, non-hazardous waste receipts, etc.

C. Sacramento Metropolitan Air Quality Management District (SMAQMD) has no notification requirements for lead related work.

D. Contractor is to submit a Lead-Work Pre-Job Notification to CAL/OSHA as required by 8 CCR 1532.1.

1.8 UNIVERSITY CONTACTS

A. **University's Representative: Ken Pickett**

1. **Phone: (916) 734-4436**

B. **UCDHS EH&S Representative: Kaila Benton-Vitz**

1. **Phone: 916-734-2740**
2. **Fax: 916-734-7309**

C. **University Hazardous Material Consultant: Entek Consulting Group, Inc.**

1. **Phone: (916) 632-6800**

## PART 2 - PRODUCTS

2.1 MATERIALS

A. Safety Data Sheets (SDS)

1. The Contractor shall provide SDS for all products used on UCDHS job sites. The SDS files shall be located near the Project site entrance at all times the product is used or stored onsite.

2. One complete set of Safety Data Sheets is to be provided to UCDHS EH&S for review prior to the start of work. (see 1.4I)

B. Encapsulants

1. It is not anticipated that encapsulants will be required for this project. If used, the choice of the correct encapsulant for a project is determined by agreement between the Contractor and the University's Representative. Two factors to consider in the choice are wear life (aim for 20 years) and usage patterns. Products shall be applied using a brush, roller or an airless sprayer. The Contractor shall follow strict manufacturer's instructions regarding surface preparation, ambient air conditions, depth of material penetration, recommended thickness of a dry application, and curing time.
   a) For penetrating and lockdown purposes Foster 32-60, Certane 909, or equal is recommended.
   b) For bridging purposes Foster 32-32, Certane 2000, or equal is recommended.
   c) For high temperature applications, e.g., steam pipes, Foster 84-18, Certane 1000, or equal is recommended.
2. Any proposed equal to the products listed above must meet the following criteria: submit product information prior to the start of the Project and must receive approval by the University Representative and UCDHS EH&S Representative; non-toxic and non-irritating as defined by the Hazardous Substance Control Act; sufficiently tinted to provide contrast with the material being coated; and have a minimum 60 psi Batelle Standard impact rating.
3. All products shall be rated UL Class A and have a flame resistance/spread rate less than or equal to 25 as designated by the ASTM code E 162. Any exceptions must be pre-approved by UCDHS Fire Prevention Office (916-734-3036).

C. Polyethylene Products

1. Floor and wall sheeting used for lead containments or critical barriers are required to have a minimum thickness of: a) 6-mil (floor) and 4-mil (walls); and b) meet the following standards -- ASTM E-84, with a flame resistance/spread rate less than or equal to 25 ASTM (E-162).
2. The polyethylene sheeting used for containment or critical barriers shall be frosted or black. Polyethylene bags or sheeting used for waste may be clear.

D. Paint Removers

1. No paint removal chemicals are anticipated for this project.
2. If used, all paint removers shall be pre-approved by UCDHS EH&S. Methylene chloride based paint removers are not permitted on this project.
3. The use of paint removers on the project must strictly comply with manufacturer application instructions and safety warnings.

2.2 EQUIPMENT

A. HEPA/ULPA vacuums and negative air machines must be leak tested on-site by a firm independent of the Contractor, who are trained and qualified to perform the challenge testing of portable HEPA filtered equipment, shall follow the manufacturers recommended test procedure, and shall use the recommended test challenge agent.

B. Tools and equipment shall arrive at the project site free of lead debris and dust.

C. HEPA/ULPA vacuum exteriors must be clean when they arrive on the project site. All openings on the vacuum, hoses, and negative air units shall be taped shut when they are brought onto the project site and when they are taken from the project site.

D. All electric tools and equipment shall be connected to a GFCI.

E. Power tools used to prepare surfaces containing lead must be connected to a HEPA/ULPA vacuum.

F. Heat guns with a working temperature less than or equal to 1100º F are permitted.

**PART 3 - EXECUTION**

3.1 SAFETY

A. In accordance with State and Federal laws, Contractor shall be responsible for conditions of the project site; including the safety of all persons and property during the performance of work. To ensure effective communication in safety matters the Contractor shall participate and conduct the following meetings:

1. A pre-construction safety meeting is required to be held with the University's Representative, University Hazardous Material Consultant, and the UCDHS EH&S Representative prior to the start of the project. The following subjects shall be discussed: Division 13 Specifications; impact to building occupants; waste disposal and work related safety programs.
2. On the first day of lead related work, the Contractor shall conduct a safety meeting (tailgate) for its employees and subcontractor employees that alert them to the specific hazards of the project. The Contractor must conduct the safety meeting in the primary language of its employees. If needed, more than one primary language presentation must occur. This same initial safety meeting must be provided to all personnel new to the project before they are permitted to start work.
3. On a weekly basis, the Contractor shall conduct a safety meeting with its employees.

3.2 WORK SITE PREPARATION

A. Prior to beginning any on-site work preparation, the Contractor shall walk the project area with the University Hazardous Material Consultant and UCDHS EH&S Representative to discuss site characterization, regulated area set-up, access controls, background samples, security, and safety issues.

B. Post all regulatory notices, permits, sign-in-out roster, at the primary entrance to the project site.

C. The Contractor, in coordination with the University Hazardous Material Consultant and UCDHS EH&S Representative shall ensure all electrical and HVAC equipment servicing the work area is disconnected and locked out. Electrical tools in the work zone must be connected to a GFCI.

D. The Contractor shall seal existing critical barriers, including HVAC openings, windows, vents, open pipes, skylights, ducts, doorways, corridors, and diffusers with double layers of plastic and cardboard or plywood inserts as necessary.

E. The Contractor shall install approved backflow prevention devices before connecting to the University's domestic water system, if necessary. Contact the University's Representative for a list of approved devices.

F. Contractor is obligated to coordinate inspection schedules with the University's Representative and the University Hazardous Material Consultant.

G. The Contractor shall establish project site control barriers.

3.3 WORK SITE CONTROL

A. The Contractor shall restrict the work areas to authorized personnel; including, the Contractor's employees, University's Representatives, UCDHS EH&S Representative, University Hazardous Material Consultant and regulatory agency representatives.

B. At regulated project sites, the Contractor shall use caution tape to demarcate the boundary of the work zone and post lead warning signs.

1. The following sign is required by Title 8, CCR 1532.1

**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**

C. All unauthorized personnel are to remain outside the regulated area. The Contractor shall call the University's Representative, EH&S Representative or the University Hazardous Material Consultant if unauthorized UCDHS staff or the public enters the containment area.

3.4 RECORDKEEPING

A. The Contractor shall maintain the following records at the regulated work area:

1. Site Log (sign-in/sign-out).
2. Incident Log and Emergency Action Plan.
3. Personal air sampling results if collected.
4. Area sample results from inside and outside the regulated area if collected.
5. Lead training certificates, respirator fit tests (if worn), and medical clearance certificates (if respirators are used).
6. Federal, state or local notifications.

B. All Items 1 through 6 shall be submitted with the "As-Built" summary Identified in "Project Close-Out".

C. The University Hazardous Material Consultant shall retain all sample records (wipe, bulk, initial, area (perimeter), and clearance samples). Results are reported on a daily basis to UCDHS EH&S and to the Project Manager. At the end of the project, all sampling records are submitted as a complete package in the project close out to the Project Manager.

3.5 ADMINISTRATIVE CONTROLS

A. Any remediation project performed in high heat environments requires the Contractor to comply with T8 CCR 3395, including providing sufficient breaks to maintain a safe environment for their workers.

3.6 ENGINEERING CONTROLS

A. Negative Pressure Enclosure (NPE)

1. Containment protocols shall follow the ICRA requirements when building materials will be disturbed, or removed creating potential dust release.
2. Mini-containments: The construction of a mini-containment requires a minimum of one layer of 6-mil polyethylene and a HEPA/ULPA vacuum or HEPA filtered negative air unit exhausting from the containment.
3. HEPA vacuumed assisted tools shall be used for drilling, cutting, sawing, or removing lead containing paint from surfaces, unless a paste type stripper product is used.

B. Lead Shielding

1. Where lead shielding, lead lined walls, lead lined windows, lead lined cabinets or lead lined doors are to be removed, the contractor shall install 6-mil plastic on the floor immediately surrounding the component being removed that contains the lead shielding. If ceilings containing lead shielding are removed, the entire floor area shall be sealed with plastic.
2. The lead shielding shall be removed using manual tools such as screw drivers, razor knives, shears, and pry bars. Power tools, heat guns, cutting torches, and other high temperature generating processes are prohibited due to rapid friction and heat increasing the potential to create lead fumes or dust.
3. Contractor shall use methods to minimize airborne lead to the greatest extent possible (e.g., removing an entire wall instead of removing sheetrock from lead shielding prior to removal).

C. HEPA/ULPA Equipment

1. The Contractor shall ensure all HEPA/ULPA filtration units are leak tested on project site by an independent testing contractor. Each piece of equipment shall be tested in compliance with the ANSI Z9.2 Standard (trapping and retaining 99.97% of all test particles of 0.3 microns). Documentation of testing is to be maintained at the work site. The UCDHS EH&S representative or Hazardous Materials Consultant shall be present to observe the challenge testing of all HEPA systems brought onsite.
2. The Contractor shall HEPA/ULPA vacuum visible debris prior to set-up, during the removal process and at the conclusion of each shift.
3. HEPA/ULPA equipment used to establish negative air pressure within a space must run continuously (24-hours a day) until the project is complete.

4. The Contractor shall ensure make-up air is drawn through an inlet that can be easily sealed in the event of a negative air failure. The inlet sealing method must also be effective when there is a failure in the system after normal work hours.
5. All HEPA/ULPA filters must be disposed of as hazardous waste.
6. Any HEPA system that has been removed from the project site and brought back to the project site shall be challenge tested again before being placed in use.

D. Wet Methods

1. Wet methods shall be considered if it is practicable. Prior to removing LCM/PLCM, the Contractor shall adequately wet the material with water.

E. Removal Operations

1. All lead lined components shall be removed as intact as possible and placed into leak tight containers before removed from the interior of the project area.
2. Ensure all accumulated debris is completely sealed by the end of the shift. After gross debris is bagged, use wet wipe methods and HEPA/ULPA vacuums to clean the polyethylene sheeting.

F. Infection Control

1. An Infection Control Risk Assessment (ICRA) will be developed for this project by the University's Representative and approved by the UCDMC Infection Prevention. Depending upon the location of the work and the potential for dust generation that could impact patient care, the ICRA may require more stringent controls than those described under this specification. Adequacy of controls may be verified by periodic airborne particle counting, conducted by EH&S or a designee. Contractor understands that any operations generating excess particles in uncontained locations will cause Contractor to modify site controls. Contractor is responsible for maintaining controls to avoid pollution of patient care spaces.

## 3.7 WORKER PROTECTION

A. The following protective measures are required for lead-related work associated with this project. These measures are not intended to be all-inclusive:

1. Employee Training/Supervision
   a. The Contractor shall provide information to its employees about lead and other hazards per the Hazard Communication standard (8 CCR, 5194) and other Cal/OSHA standards as appropriate for the project.
   b. All contractor and subcontractor personnel are to be trained to the level of their project assignment in accordance with 8 CCR 1532.1, which at a minimum will require lead awareness training (1-2 hours in length).
2. Respiratory Protection
   a. The Contractor shall provide respiratory protection to all employees where there is the potential for exposure to lead dust at or above the permissible exposure limit per Title 8 5144 Respiratory Protection. If the lead lined components are removed relatively intact and if there is no dust or particulate generated, respirators will not be required. Therefore, the work practices chosen by the contractor will define if respirators will be required based on the methods of removal that may or may not generate finely divided particles.

b. The Contractor's employees who wear a respirator must have passed a fit test within the previous 12 months to perform contract work at the University.

3. Protective Clothing and Other Personal Protective Equipment
   a. The Contractor shall provide workers with sufficient sets of protective clothing. Tyvek™, Kleenguard™ or equivalent, coveralls (with hood and feet protection) or equal are acceptable. The Contractor shall also provide coveralls to qualified UCDMC personnel, University Hazardous Material Consultant, State and local officials.
   b. Note that work in sterile areas may require multiple sets of clothing or staging of additional protective clothing to ensure sanitary conditions are maintained.
   c. The Contractor shall provide rubber, latex or Nitrile gloves, eye protection, earplugs and hard hats as needed per the 8 CCR, Hazard Communication and Personal Protective Equipment standards.
4. Medical Surveillance
   a. As required by 8 CCR 1532.1, the Contractor shall establish a medical surveillance program for all employees performing lead work if work is expected to exceed the Action Level for more than 30 days per year. In addition, all personnel required to wear a respirator shall have a medical evaluation to assure they are capable of wearing a respirator per T8 CCR 5144.
   b. The Contractor shall demonstrate all project personnel are participating in the medical surveillance program with evidence supported in the pre-job submittal.

## 3.8 PERSONAL HYGIENE

A. The Contractor shall require that no employee be allowed to apply cosmetics, or consume food, tobacco products, or beverages in the regulated work area.

B. The Contractor shall establish a location outside the work area, which shall be designated for employee eating and drinking. Employees must utilize the on-site decontamination facilities for clean-up prior to entering the designated eating/drinking location. The eating area shall be kept clean of dust on all horizontal surfaces. Cleaning stations shall include clean water, soap, and towels. Al workers shall clean face, hands and lower arms before leaving the work area for break periods, and at the end of the work shift.

## 3.9 AIR MONITORING PROGRAM

A. Personal Air Samples - Contractor Responsibility

1. If lead lined materials are removed relatively intact and there is no dust generation, air sampling would not be required. Shearing or scoring lead lined materials is one method where lead dust will not be released.
2. If the contractor use work practices that will generate lead dust, the contractor shall conduct initial and daily exposure assessments in accordance with T8 1532.1.
3. Exposure assessments are to be conducted in accordance with 8 CCR 1532.1(d).

## 3.10 SPECIFIC WORK PROTOCOLS

A. Specific work protocols, cited below, provide minimum guidance for the performance of site work.

1. Initial Site Clean-Up

a. No pre-cleaning is required for this project.
b. LBP/LCM contaminated chips or debris, etc. generated during the project shall be collected while workers are wearing proper respirators and disposable coveralls, and using HEPA vacuums, wet methods, polyethylene bags, lead warning labels and proper disposal protocols.

2. Interim Controls (In-Place-Management)
   a. This is a control measure to reduce or eliminate lead exposure for less than 20 years. It is not considered abatement. Several strategies are used to control potential exposure to LCM left in place; including, dust removal, paint stabilization, treatment of impact/friction surfaces, and soil coverings. No Interim Controls for lead are included in this project.
   b. Dry blasting LCM is not permitted except by special circumstances pre-approved by the UCDHS EH&S Representative.
   c. Water blasting LCM surfaces will not be allowed.
3. Abatement
   a. Lead abatement is not planned for this project. Abatement is meant to permanently control a lead hazard for a period of time greater than 20 years.
   b. The renovation project may impact lead in building components, but any disturbance to lead in paint must follow the Lead in Construction requirements of 8 CCR 1532.1.
   c. If the contractor needs to remove paint from surfaces, there are many options to consider including use of paint removal paste (such as Peel Away or equivalent), wet sanding, and HEPA equipped shrouded tools when disturbing LCM surfaces.
   d. Dry blasting LCM is not permitted except by special circumstances pre-approved by the UCDHS EH&S Representative.
   e. Water blasting LCM surfaces will not be allowed.

## 3.11 INSPECTIONS

A. Inspection Responsibilities - Contractor

1. Prior to beginning any lead-related work, the Contractor’s supervisor shall inspect the regulated work areas for any building damage, hazardous conditions and/or irregularities that may contribute to an unsafe work environment. Any condition that poses a hazard or potential hazard to the Contractor’s employees or the University’s employees, patients and visitors must be immediately reported to the University’s Representative.
2. The Contractor is responsible for notifying and allowing sufficient time for the University Hazardous Material Consultant to conduct inspections at all phases of the project.
3. The Contractor shall establish emergency response protocols for a manometer alarm sounding after they have left the project site. Under no circumstances shall the Contractor shut off negative air machines unless the project has received final clearance. Dust control requirements under the ICRA Permit will require the work space to be placed under negative pressure for the duration of the demolition phase and new construction phase.
4. All waste shall be characterized and separated by the Contractor. All recommended disposal processes must be reviewed and approved by the UCDHS EH&S Representative.

B. Inspection Responsibilities – University Hazardous Material Consultant

1. The University Hazardous Material Consultant shall walk the project site with the Contractor and the UCDHS EH&S Representative to review scope of work, pre-

cleaning operations and any safety or security issues. The University Hazardous Material Consultant may attend the Contractor's safety meetings.

2. If minor lead related work requires removal of paint from surfaces using a paste, or work practices using HEPA filtered equipment, the hazard control measures shall be evaluated by the University Hazardous Material Consultant or University EH&S.
3. Prior to lead related work activities beginning, the University Hazardous Material Consultant shall match on-site personnel with lead training certificates, fit tests and medical exam records. Workers without on-site documentation shall not be allowed in the regulated area. University Hazardous Material Consultant shall collect baseline dust wipe samples prior to the lead related work activities beginning.
4. The University Hazardous Material Consultant is responsible for:
   a. Reviewing all sampling data and all waste stream profiles.
   b. Alerting the UCDHS EH&S Representative of any sample result exceeding 2 $\mu g/m^3$ per 8 hr. TWA.
   c. Review Contractor's performance and non-compliance report to the Project Manager.
5. The University Hazardous Material Consultant shall file a report of activities with the University's Representative and the UCDHS EH&S Representative on an agreed upon schedule.
6. After abatement or interim control activities are complete, the University Hazardous Material Consultant shall verify completeness of all visible debris is removed. University Hazardous Material Consultant shall collect additional sets of dust wipe samples after the following phases have been completed:
   a. Post-removal of lead shielding
   b. Post-installation of lead shielding
   c. After all finish materials have been installed prior to re-occupancy.
7. Prior to any dust wipe sampling, the regulated areas shall be visually inspected by the University Hazardous Material Consultant for the presence of LBP chips, visible settled dust or debris. Dust wipe sampling shall not take place until the area has successfully passed this visual inspection. Dust wipe sampling shall be conducted in locations most likely to be contaminated.

## 3.12 ENCAPSULATION, FINAL CLEAN-UP AND RESTORATION

A. Encapsulation

1. Encapsulation for lead painted components is not anticipated for this project.

B. Final Clean-Up

1. Contractor shall clean entire project area of dust from all surfaces within the construction work area using HEPA vacuum and/or wet wiping techniques.

C. Restoration

1. Fixtures, equipment or objects relocated to storage areas designated by the University's Representative shall be restored to their exact position. The Contractor assumes full financial responsibility for damage to these objects.

## 3.13 WASTE DISPOSAL

A. Packaging Lead Waste
   1. All lead containing waste material must be packaged and labeled in accordance with U.S. DOT, DTSC and EPA requirements.

B. Storing Lead Waste

1. At the end of each shift, all lead waste shall be stored in leak-tight containers and placed in a lockable container or shipped off site. Accumulated waste shall not be allowed to remain in the regulated work area overnight. No container shall be allowed to remain at the project site for greater than 90 continuous days from date the first waste container was generated.

C. Uniform Hazardous Waste Manifest Procedures
1. The Contractor or transporter is responsible for providing appropriate Uniform Hazardous Waste Manifests for the transport of hazardous waste materials. Only authorized EH&S personnel can sign on behalf of the UC Davis Medical Center (generator).
2. If the lead lined components are to be recycled, a Uniform Hazardous Waste Manifest is not required, since it would not be considered a waste.

D. Transporting Lead Waste to Class 1 Landfill
1. A DTSC registered waste transporter, hired by the Contractor, is responsible for transporting hazardous lead waste from the Medical Center to (Chemical Waste Management, 35251 Old Skyline Road, Kettleman City, CA 93239), an EPA permitted disposal facility. Under certain conditions, UCDHS EH&S will permit hazardous lead waste to be transported to an alternative facility.
2. The transporter shall make pick-ups during normal Working hours - 8:00 AM to 5:00 PM, Monday through Friday. The Contractor must comply with DOT label requirements for their vehicles.
3. The Contractor must make shipments of lead waste containing less than 1,000 mg/kg lead but greater than 350 mg/kg of lead to a Class 1 landfill. This shipment does not require a registered waste hauler.

E. Disposal
1. The selection of a Treatment, Storage and Disposal Facility as an alternative to a landfill for disposal of lead waste must be reviewed and approved by the EH&S representative prior to arranging for the shipment of the waste.
2. The Contractor shall provide waste documents from the Waste Disposal site as verification of the weight and proper disposal site, to the UCDHS EH&S Representative within 15 days of each container disposal.
3. Lead waste that has been contaminated with another hazardous waste (e.g. solvents) must be tested and disposed of according to all applicable standards.
4. All lead waste will be sampled for Characterization before determination of Hazardous or Non-Hazardous material is made. Sequence of testing is as follows:
   a. A TTLC result of ≥1,000 mg/kg is considered a hazardous waste.
   b. TTLC with a result of ≥50 mg/kg of lead must be retested using STLC method.
   c. A STLC result of ≥5.0 mg/l must be retested using TCLP.
   d. A TCLP result of ≥5.0 mg/l deems the waste Federal RCRA.
   e. A STLC of ≥5 mg/l is categorized as State Hazardous Waste (Class 1).
   f. A TTLC with a result of >350 mg/kg but <5.0 mg/l (STLC and TCLP) must go to landfill permitted to accept this level of lead although it is not hazardous. (See Item 6 below)
5. Contractor shall provide a waste stream report to the University Hazardous Material Consultant identifying the number of containers and an explanation of how the samples were taken (composite or individual container sampling). A waste stream profile must be conducted on each unique waste stream. Confirmation will be provided by the Consultant, indicating all waste streams have been sampled per project specifications.
6. All waste with total lead >350 ppm (mg/kg) disposed of in California, must be disposed of at a permitted Class 1 Hazardous waste landfill, or at other landfills that have specific permits to accept these wastes. However, the wastes are not classed as hazardous wastes unless for a reason other than lead content. The California hazardous waste threshold for total lead is ≥1,000 mg/kg and the soluble threshold concentration (STLC) for lead is ≥5 mg/l.

F. Recordkeeping

1. The Contractor shall provide the UCDHS Project Manager with copies of all waste disposal documents and all recycled materials documents.

G. Fees

1. The Contractor is responsible for all fees and charges related to lead waste transport and disposal operations; including, waste steam profiles. Refer to SW-846-1311 (TCLP) and CCR, Title 22 Section 66261 (STLC) for waste stream identification requirements.

H. Non-Hazardous Waste Manifest

1. The UCDHS EH&S Representative or Hazardous Materials Consultant (if authorization is provided by UCDHS) is responsible for reviewing and signing non-hazardous waste manifests. Prior to the Representative signing the manifest, the University Hazardous Material Consultant shall inspect the load and confirm its non-hazardous status.

I. Recycled Metals

1. Recycling ferrous or non-ferrous metals with adhered lead paint is encouraged by the UCDHS. The UCDHS expects that all lead shielding building components such as walls, glass, doors, cabinets, etc., will be recycled. This section defines "Hazardous Waste" for the purpose of defining waste stream as material that is placed in a land fill. Employee protection regulations remain the same during disturbance of lead. The Contractor is required to remove all loose and flaking paint if painted components contain lead. The Contractor is responsible for removing all other hazardous material that is unacceptable by the recycling firm. The Contractor is required to recycle where possible. The contractor will obtain a letter from the recycler acknowledging that the recycler is aware of the lead paint and/or lead lining-shielding and has an Injury Illness Prevention Program (IIPP) that addresses the handling of this material that meets OSHA and EPA regulations. There is no UCDHS requirement for testing (TTLC, STLC, or TCLP) the recycle material stream.

3.14 CLEARANCE PROTOCOL

A. Abatement and Interim Control Projects

1. Lead abatement is not planned for this project; regardless, clearance wipe sampling is planned for this project. The following will be conducted:
2. Prior to any clearance sampling, the regulated areas shall be visually inspected by the University Hazardous Material Consultant for the presence of LBP chips, visible settled dust or debris. Final clearance sampling shall not take place until the area has successfully passed this visual clearance. The Consultant shall follow the U.S. Housing and Urban Development (HUD) clearance wipe sampling protocol, which includes wiping one square foot of the surface being tested using an “S” pattern with an approved commercial lead sampling wipe. Clearance wipe sampling shall be conducted in locations most likely to be contaminated.
2. The University Hazardous Material Consultant and University’s Representative following HUD guidelines and CDPH Title 17 requirements, shall select the total number of clearance samples for each job site and shall use the Title 17 criteria for clearance purposes.

## 3.15 PROJECT CLOSE OUT

A. Before the final certificate for payment is issued to the Contractor the following information shall be provided to the University's Representative:

1. Using Exhibit 25 Lead Remediation-As-Built Summary (located in the Exhibits section of the Contract Documents) provide "As-Built" summary to include:
   a. Contractor's name, addresses, CSLB certification number, DOSH registration number, and tax identification number.
   b. Name of hazardous transporter, address, phone number and registration number.
   c. ELAP laboratory name(s), addresses, and phone number(s) used to perform AA (flame), TCLP, TTLC or STLC analysis.
   d. Building name and campus address.
   e. Project name and contract number.
   f. Describe scope of Work; Interim Controls or Abatement and location (room number[s]); provide drawings detailing the areas in which lead work that were accomplished.
   g. Provide an inventory of the LCM/PLCM removed from the project site. Include: building system, quantity, note whether the project was Abatement or Interim Controls, the percentage of the total lead job for each building system type and cost.
   h. Total dollar amount paid by the University for lead-related work including invoice date(s) and date(s) payment received.
   i. Number of employees who worked on the project.
   j. Date on-site work began.
   k. Date on-site work was completed.
   l. Work methods.
   m. Did the University provide specification (answer yes or no).
   n. Name, address, phone number and EPA registration number of waste disposal site.
   o. Note that all copies of waste documents from the Waste Disposal site for hazardous material must be received by the University's Representative as part of this section.
   p. The Contractor shall provide copies of all laboratory reports lead work protocols, and disposal documents requested by the University's Representative.
   q. All documents relating to actual employees used for remediation purposes (see Section 3.4, A).

**END OF SECTION 13281**