ENVIRONMENT, SAFETY & HEALTH DIVISION

Chapter 20: Lead Safety

Lead Work Requirements

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URL: https://www-group.slac.stanford.edu/esh/eshmanual/references/leadReqWork.pdf

1 Purpose

The purpose of these requirements is to minimize worker exposure to, and environmental contamination from, *lead*. They cover working with lead, including radioactive lead. They apply to workers (as *lead workers*, *lead handlers*, *lead users*, and riggers), supervisors, the lead safety program manager, Industrial Hygiene, and Waste Management.

Lead work is defined as tasks such as

- Handling or stacking lead bricks
- Handling *legacy lead*
- Machining lead (cutting, shaping, or finishing of lead materials using powered tools)
- Welding or torch soldering on lead material
- Using lead-containing solder
- Grinding, sanding, wire brushing, or other abrasion of lead-containing paint

2 Requirements

2.1 Determination

An industrial hygiene survey will be conducted to determine the potential for lead exposure and required controls. A survey is required for specialized lead work such as welding of materials that contain lead, handling lead waste, removing lead-containing paint from painted surfaces, and periodically for routine work, according to regulatory requirements.

2.2 Controls by Type of Work

Lead Work Description	Required Control
All lead work	Worker ▪ Completes all applicable training before work begins, as indicated below, including any indicated medical surveillance ▪ Uses all applicable personal protective equipment (PPE): ▪ Safety-toed shoes or boots

Lead Work Description	Required Control
	▪ Gloves ▪ Additional PPE as stated for each lead work task below ▪ If using leather gloves for lead work, does not use for any other type of work and stores in a labeled plastic bag ▪ Coveralls must be of the disposable variety to avoid contaminating a clothes washer or other clothing ▪ Respirators must be cleaned and stored according to procedures set forth in Chapter 29, "Respiratory Protection". ▪ Disposable PPE used for lead work, such as latex gloves and disposable coveralls, must be collected by Waste Management and be disposed of as hazardous waste (see Chapter 17, "Hazardous Waste"). ▪ Maintains surfaces as free as practicable from accumulation of lead as required by 8 CCR 5198 [h][1] ▪ Cleans up lead and lead-contaminated waste properly. A regular shop vacuum cleaner or compressed air may not be used. Only these methods are allowed: ▪ Using a vacuum cleaner equipped with a high-efficiency particulate air (HEPA) filter, labeled FOR LEAD CLEANUP ONLY. Industrial Hygiene must be contacted when replacing the filter to ensure it is removed and disposed of without creating contamination. ▪ Wiping the area with a wet paper towel. Dry sweeping of lead debris is never allowed. Paper towels must be disposed of as lead containing debris (see below). ▪ Mopping floors is an acceptable way of removing lead from indoor surfaces. The mop head and wastewater must be disposed of as lead containing debris (see below). ▪ Disposes of lead and lead-contaminated waste properly: ▪ All lead or lead-contaminated waste must be disposed of by Waste Management (WM). ▪ WM provides containers for large amounts of lead-contaminated waste (complete form before the waste is generated). Examples include non-reusable wooden pallets contaminated with lead and non-reusable plastic sheets used for lead storage. ▪ Smaller quantities of waste such as paper towels used for cleaning lead dust and disposable personal protective clothing (PPE) used for lead work may be placed in a labeled plastic bag. WM should be contacted for immediate pickup. ▪ If lead-contaminated waste is generated on a regular basis, a designated container should be requested, which WM will track and empty automatically (Hazardous Waste Pick-up and Empty Container Request Form). ▪ Lead filings must be collected for recycling and brought to Central Lead Storage (Building 413). ▪ Always washes hands immediately after working with lead ▪ Never eats, drinks, or smokes in or around areas where lead is handled or stored ▪ When handling lead bricks, picks up only one brick at a time, using both hands. (A single lead brick weighs 27 pounds.) Uses correct lifting techniques.

Lead Work Description	Required Control
	▪ Limits work to the time specific to the task as described below. (If no time is specified, the maximum is four hours per day.) ▪ Applies additional requirements as listed by task below. If task is not listed below, contacts lead safety program manager before work begins.
Lead work in an area with limited or no ventilation (such as a confined space)	Supervisor contacts lead safety program manager to complete a job safety analysis (JSA) to determine the need for engineering controls such as a portable air cleaner and the need for medical surveillance

Handling lead shielding for **more than 30 minutes** on any one day	Worker
	▪ Completes ESH Course 240, Lead Safety (ESH Course 240)
	▪ Notifies the lead safety program manager of work schedule
	▪ Uses additional PPE
	  ▪ Disposable coveralls
	  ▪ Half-mask respirator with HEPA filter
	▪ Completes medical surveillance
	  ▪ ESH Course 240ME, Lead Safety Baseline Medical Exam (ESH Course 240ME)
	  ▪ ESH Course 241ME, Respirator Safety Medical Exam (ESH Course 241ME)
	  ▪ Workers who perform this task for 30 days or more per year must complete ESH Course 406ME, Lead Semi-Annual Exam (ESH Course 406ME)
	Supervisor
	▪ Posts the appropriate lead work area warning sign (see Lead Safety: Lead Management Requirements)

Handling lead shielding for **30 minutes or less** on any one day	Worker completes ESH Course 262, Lead Hazcom Training (ESH Course 262)
Machining lead shielding using a powered tool such as a milling machine, drill, or saw	Worker ▪ Performs only in designated locations (see Lead Safety: Lead Management Requirements) ▪ Completes ESH Course 240, Lead Safety (ESH Course 240) ▪ Collects and recycles all lead cuttings (see above) ▪ Cleans machine tools and bits of lead contamination with a disposable paper towel. Removes lead and towels to be disposed of as lead containing debris (see above). Supervisor ▪ Notifies the lead safety program manager before machining begins
Use of lead-containing solder	Worker ▪ Does not flick solder onto the bench or floor ▪ Cleans bench tops using a wet paper towel; does not allow lead to accumulate. Removes lead and towels to be disposed of as lead containing debris (see above)

Lead Work Description	Required Control
	▪ Collects solder in designated containers (provided by WM, see above) and labeled with SOLDER WASTE FOR RECYCLING and contact person's name, extension, building, and room number ▪ Whenever the solder container is half full (and at least once per year) the container must be emptied into the Salvage recycling container. ▪ A worker may take the dedicated container to Salvage if it is fitted with a secure lid or the solder may be emptied into a zip-lock bag and the bag placed or emptied into the solder recycling container. Note: the container is to be reused, not disposed of. ▪ WM can transport waste solder: call ext. 2399 or submit a completed Hazardous Waste Pick-up and Empty Container Request Form ▪ Discarded printed circuit boards or other items that contain solder must also be taken to Salvage for recycling
Any grinding, sanding, wire brushing, or other forms of abrasion of a surface coated with lead-containing paint	Supervisor notifies the lead safety program manager before any work begins so that paint can be tested for lead, especially before starting renovation or demolition work on older buildings
Handling radioactive lead	Worker ▪ Must have ESH Course 116, Radiological Worker I Training (ESH Course 116). Handling includes the use of hands or tools to move/manipulate radioactive lead. ▪ If the lead has loose radioactive contamination, then must have ESH Course 116, Radiological Worker II Training (ESH Course 250). (Radioactive contamination information is noted on the radioactive material tag.) ▪ Must contain lead identified as having loose radioactive contamination using appropriate methods, such as wrapping in polyethylene
Working with radioactive lead	Supervisor must obtain a radiological work permit (RWP) before work begins. Work includes the use of tools to perform actions such as cutting, machining, welding, grinding, filing, or drilling on radioactive lead. The RWP will list the radioactive controls, which may include ▪ The use of HEPA vacuums ▪ Personal protective equipment (PPE) for contamination ▪ Respirators ▪ Ventilation Note to obtain an RWP a procedure or RWP application must be submitted to Radiation Protection Field Operations (RPFO) detailing the tasks to be completed (see the Radiological Work Permits Procedure for further information).

3 Forms

The following forms and systems are required by these requirements:

- None

4 Recordkeeping

The following recordkeeping requirements apply for these requirements:

- None

5 References

SLAC Environment, Safety, and Health Manual (SLAC-I-720-0A29Z-001)

- Chapter 20, "Lead Safety"
  - Lead Safety: Lead Management Requirements (SLAC-I-730-0A09S-036)
- Chapter 9, "Radiological Safety"
  - Radiological Safety: Radioactive Material and Waste Requirements (SLAC-I-760-0A30S-001)
- Chapter 17, "Hazardous Waste"
  - Hazardous Waste Pick-up and Empty Container Request Form (SLAC-I-800-0A08R-001)
- Chapter 29, "Respiratory Protection"

Other SLAC Documents

- Industrial Hygiene
- Radiological Work Permits Procedure (SLAC-I-760-0A05C-002, FO 005)
- ESH Course 262, Lead Hazcom Training (ESH Course 262)
- ESH Course 240, Lead Safety (ESH Course 240)
- ESH Course 240ME, Lead Safety Baseline Medical Exam (ESH Course 240ME)
- ESH Course 241ME, Respirator Safety Medical Exam (ESH Course 241ME)
- ESH Course 406ME, Lead Semi-Annual Exam (ESH Course 406ME)
- ESH Course 116, Radiological Worker I Training (ESH Course 116)
- ESH Course 250, Radiological Worker II Training (ESH Course 250)

Other Documents

- Title 8, *California Code of Regulations*, "Industrial Relations", Division 1, "Department of Industrial Relations", Chapter 4, "Division of Industrial Safety", Subchapter 7, "General Industry Safety Orders", Group 16, "Control of Hazardous Substances", Article 109, "Hazardous Substances and Processes", Section 5198, "Lead" (8 CCR 5198)