



# APPENDIX A

## LEAD ABATEMENT IN HOUSING

Learning objectives .....	A-3
Skit: A home abatement job .....	A-4
Discussion questions .....	A-4
Doing the abatement .....	A-5
Windows .....	A-6
Doors .....	A-10
Woodwork (not including doors and windows) .....	A-12
Walls .....	A-13
Ceilings .....	A-17
Floors .....	A-18
Staircases .....	A-20
Porches .....	A-22
Outside brick and cement .....	A-23
Key facts for Appendix A .....	A-25
For more information .....	A-26



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## Lead Abatement for Workers

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### Learning objectives

In this appendix you will learn how to treat lead-based paint on

- windows
- doors
- woodwork
- walls
- ceilings
- floors
- staircases
- porches

You will also review the differences between abatement and interim controls.



### Skit: A home abatement job

Sam has worked in a lot of trades. He was recently trained in lead abatement because he heard there was some work available. Later, Sam and his buddy, George, got a job doing home abatement for a neighbor. They needed to get some experience, so they bid low in order to get the job.

**Sam:** We should've looked over the inspection report before submitting that bid. There's lead-based paint everywhere!

**George:** You're telling me. We're going to have to cut corners somehow. How about the windows?

**Sam:** No, let's not skimp there. They're a big hazard. Let's go ahead and replace them, but get cheaper windows.

**George:** How about if we just repaint the doors and replace the stop?

**Sam:** Not a bad idea, and we can just repaint the ceiling where it needs it.

**George:** All right, good plan! Boy, could I use a smoke. It's going to be tough smoking only outside.

### Discussion questions

1. What do you think of Sam's and George's plan?
2. Can you manage the hazard of lead-based paint on a surface such as a window by just repainting it? Why or why not?
3. Does it make sense to repaint the doors and replace the stops?
4. Why do lead abatement workers who smoke have a harder time keeping their lead exposure down?





### Doing the abatement

**Abatement** means getting rid of lead-based paint hazards. Abatement methods are discussed in Chapter 6.

Whenever you do abatement you must use the personal protection that is appropriate for the job. You can find this information in the HUD *Guidelines*. OSHA says you must be trained on PPE and the hazards of working with lead. The following chart shows which methods are used for different parts of a home.

Method	Where can you best use it?
REPLACEMENT	<ul style="list-style-type: none"><li>• Windows, doors, moldings</li><li>• Any easily removed component</li></ul>
ENCAPSULATION	<ul style="list-style-type: none"><li>• Walls, ceilings, trim</li></ul>
ENCLOSURE	<ul style="list-style-type: none"><li>• Floors, pipes, ceilings, exterior trim</li></ul>
PAINT REMOVAL	
Wet Scraping	<ul style="list-style-type: none"><li>• As an interim control for loose paint</li><li>• Not as a removal method for large areas</li></ul>
Heat Gun	<ul style="list-style-type: none"><li>• Flat surfaces</li><li>• Thick layers of paint (softens them)</li></ul>
Caustic Paste	<ul style="list-style-type: none"><li>• Decorative molding</li><li>• Soft woods, brick, cement</li></ul>
Solvents	<ul style="list-style-type: none"><li>• Metal substrates</li><li>• To clean residue left by other methods</li></ul>
Off-site Chemical Stripping	<ul style="list-style-type: none"><li>• Restoration work</li><li>• Doors, mantels, metal railing, trim</li></ul>



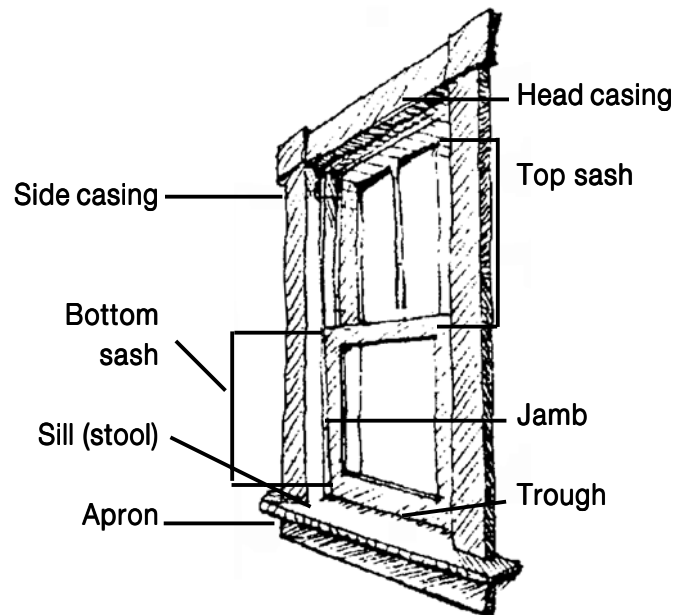
The greatest levels of lead dust are often found in the window troughs.

### Windows

**Lead-painted windows are often the greatest source of lead dust.**

Opening and closing windows causes **friction** between painted surfaces. This friction creates dust. Windows are exposed to water, sun, wind, and temperature changes. These all cause paint to deteriorate and create dust.

**Put extra poly up when you work on windows.** Attach the poly to the wall underneath the window and extend the poly out at least 6 feet. Do this both inside and outside the window.



### Window abatement

**Replacing lead-painted windows is a good choice because**

- raising and lowering the windows may produce lead dust;
- children like to play in and near windows;
- old windows are expensive to maintain;
- new windows can save energy;
- new windows may increase property value.

**If you must keep the old sashes, you can**

- Remove the sashes and have them stripped off site whenever possible. Clean, reglue, refinish, and paint them before reinstalling.
- Replace the stops and the parting bead.
- Enclose or chemically strip the jamb.

Replace window units.



- Replace the casing and the apron.
- Replace the sill (stool) or enclose it.
- Enclose the outside of the window with wood or coil stock. **WARNING:** Enclosing wood with coil stock may cause exterior wood to rot.

### Interim controls

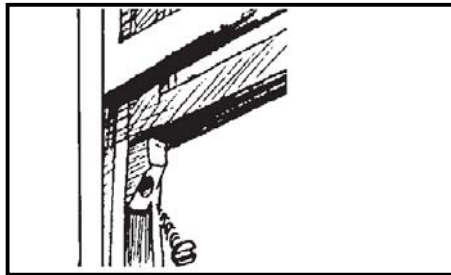
If you are not going to abate lead-painted windows right away, you can still treat them so they create less lead dust. (Make sure these options are legal in your state and local area!)

### The sashes

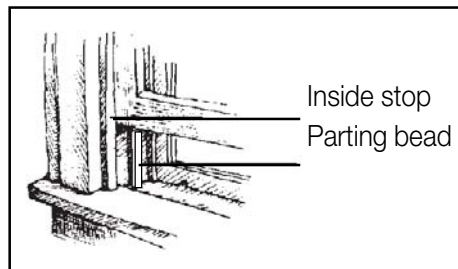
The goal is to eliminate friction against leaded surfaces.

- **Fix the top sash in place.**

Nail or screw in wood blocks under the top sash to hold it in place. (Make sure this is legal to do in your area.) This way you will only have to work the bottom sash.

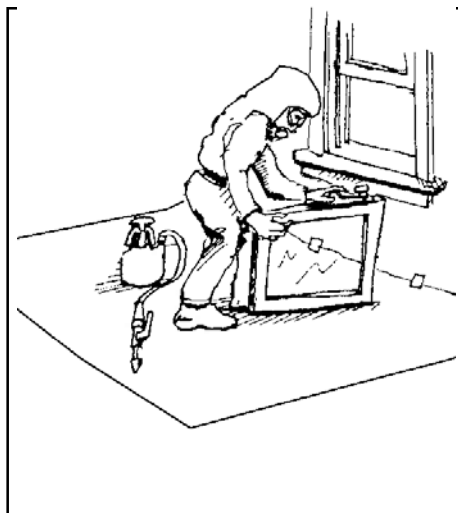


- **Remove and dispose of inside stop.** Do the same with the **parting bead** if you are treating the top sash as well as the bottom.



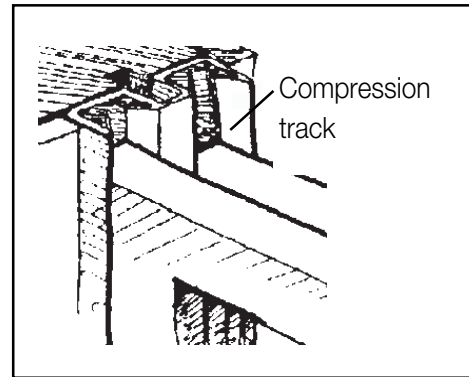
- **Remove the bottom sash.** If the counter-weight ropes or chains are in place, do not let them drop into the weight compartment.

- **Remove the paint from edges that rub against stop, sill (stool), and parting bead.** Wet planing is a good method.





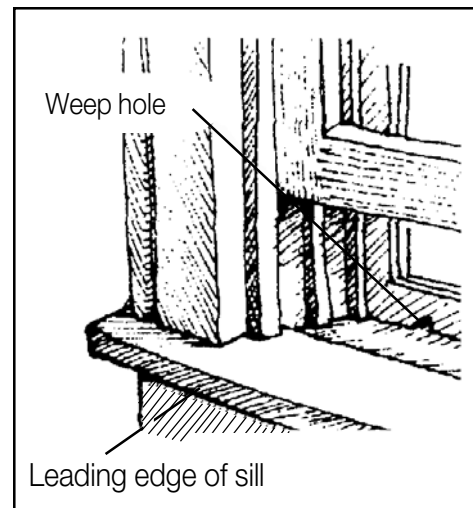
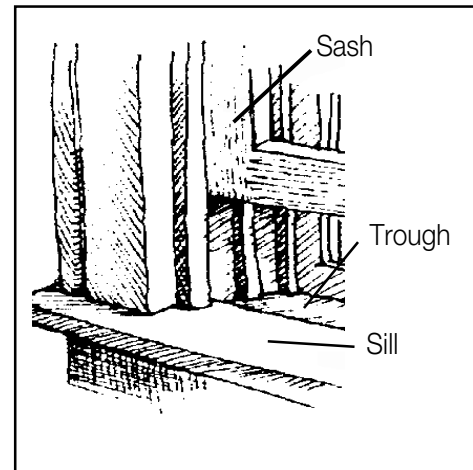
- **Rehang the sash(es)** in a compression track. If there is no counter weight or spring system, install one.



### The trough and the sill (stool)

When a window sash is lowered, the opening the sash fits into is called a **trough**. This area is typically one of the highest dust areas.

- **HEPA vacuum the trough.**
- **Create a cleanable surface.** Enclose trough with vinyl or metal coil stock. Back caulk the material and nail it down. Caulk the edges from the top.
- **Open or drill out weep holes.** (Weep holes are drain holes in the bottom of storm windows.)
- **The sill** (most window makers and carpenters call this the “**stool**”) is at the base of the window, inside the house. Children often look out the window and may put their mouths on the sill. **Wet plane or enclose the edge facing the room.** You may also need to enclose or remove the paint from the top surface.

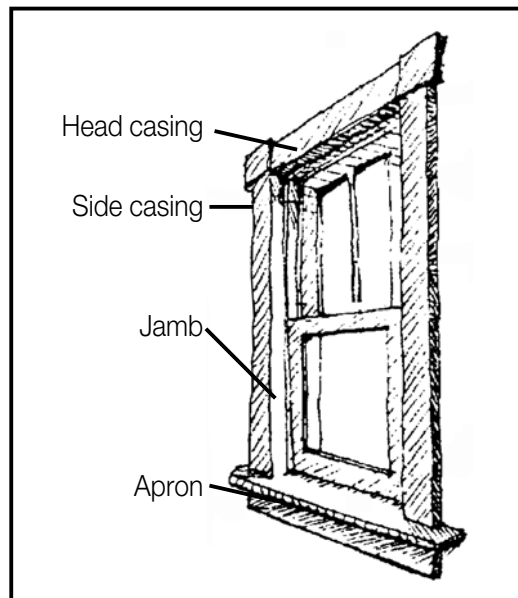






### The casing, apron, jamb

- If the paint on the casing, apron, and jamb is in good shape, you may be able to just wet scrape and repaint. Remember, paint is not an encapsulant. Repainting is only a temporary solution!
- If the outside jamb is still exposed and the outside casing is damaged, wet scraping and painting may not be enough. Seal any exposed wood with boiled linseed oil (or equivalent) and paint. Enclosing the trim with coil stock will also work, but may cause exterior wood to rot.



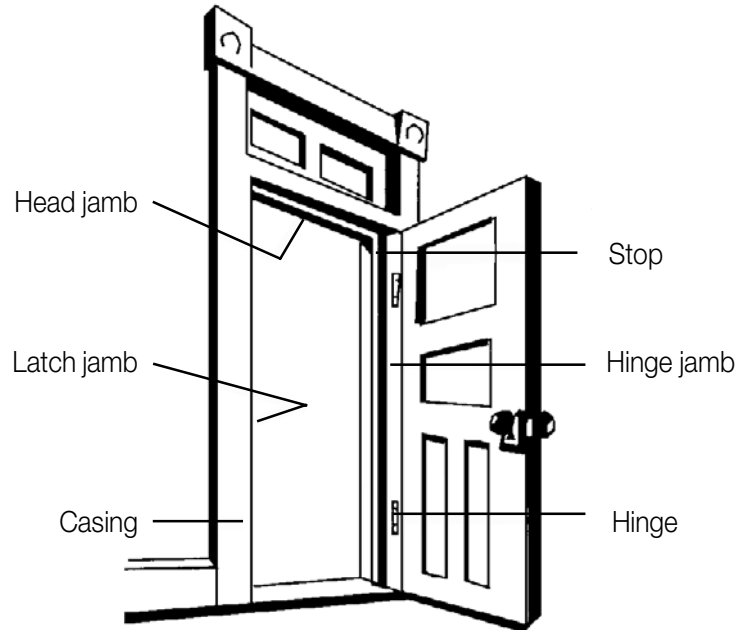


### Replace doors.

Lead-painted doors are a source of lead dust.

### Doors

Opening and closing doors creates an **impact**. When you impact a lead-based painted surface again and again, lead dust is created. Outside doors are exposed to water, sun, wind, and temperature changes. These cause paint to **deteriorate** and create lead dust.



### Door abatement

**Replacement** is often the easiest, most cost-effective method. There are a number of ways to do this:

- Replace door and door stop.
- Install a pre-hung door and keep old jamb.
- Install a pre-hung door and new casing.

Taking out old casing can damage the surrounding wall. New casing should be wide enough to cover any damage. It should also cover the jamb edge and the area where the old casing meets the wall.

### Remove the paint off site.

If you must preserve the door and casing, send them to be **stripped off site**. Clean them when they come back. Reglue, fill in any holes or cracks, and wet sand them. Reinstall and paint after inspection.



### **Remove the paint on site.**

You can remove the lead-based paint **on site** with chemical stripping, wet scraping, or by using a heat gun. Needle guns equipped with HEPA filters may be used for metal doors. These methods require time and patience.

### **Interim Controls**

If you are not going to abate lead-painted door systems, you can still treat them so they create less lead dust. (Make sure these options are legal in your state and local area!)

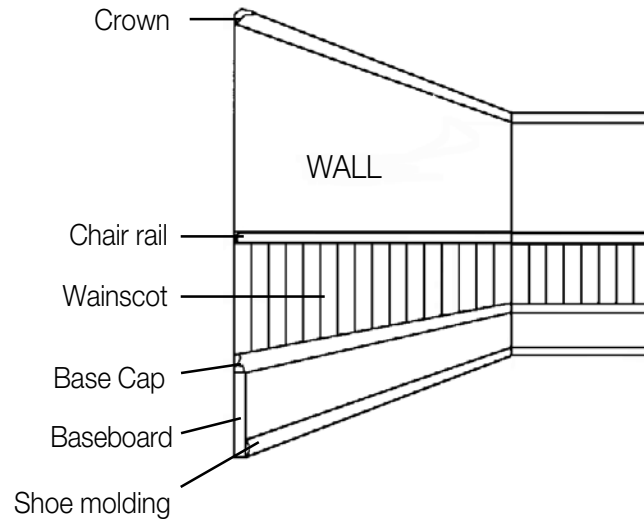
1. **Replace the stop—or wet plane it.**
2. **Wet plane the corner edges** of the door on the latch side where it contacts the stop.
3. **Re-set the hinge screws if necessary.**

The door should not make any wood-to-wood contact, except against the latch (knob) side stop. If it does, rehang the door or plane the hinge side of the door until there is about 1/8-inch space.



### Woodwork (not including doors and windows)

Lead-painted woodwork can be a source of lead dust, especially impact points such as chair rails, baseboards, and jamb edges.



**Replace or encapsulate woodwork.**

#### Woodwork abatement

- **Replace**

Woodwork can be replaced. Remember to back caulk and nail down replacement parts when you install them.

- **Encapsulate**

Encapsulate if the paint is in good shape.

#### Interim controls

If you are not going to abate lead-painted woodwork, you can still treat it so that it creates less lead dust. (Make sure these options are legal in your state and local area!)

- **Wet plane and enclose any edges** on surfaces where children may put their mouths.
- **Where paint is intact, paint over with a high-grade paint.** Paint is not an encapsulant. Repainting is only a temporary measure!
- **Cover impact points** (chair rails, baseboards, jamb edges) with a strip of solid lattice or corner protector.



### Walls

Kitchen, bathroom, and basement walls were often painted with lead-based paint. Other walls in a home can have lead-based paint, too. Encapsulation and enclosure are the methods most often used to abate lead-painted walls. Regardless of the type of abatement chosen, the cause of the damage (e.g., leaking roof, leaking chimney, termites, etc.) to the wall(s) **must be fixed first**.

#### Wall abatement

- **Encapsulating walls**

The wall must be sound. Plaster or plaster board must be in good shape. There cannot be any major peeling of the existing paint layers. If the wall is not sound, the encapsulant could pull right off the wall. If the wall is sound, but has minor cracks or chips, a mesh system works well. It will seal the cracks and chips. Old wallpaper should be removed because it can cause the encapsulant to fail.

- **Prepare the wall.** Wet scrape any loose paint. Clean off any oil, dirt, and grease with a solvent or detergent.
- **Wear the right protective gear.** You may need to use chemical-resistant protective gear. Wear your respirator and goggles. Check the encapsulant MSDS. Make sure you have the right filters for your respirator. You may need a combination filter.
- **Mix the encapsulant.** Follow the manufacturer's directions.
- **Do a "test patch."**
- **Ventilate the area.** Some products need extra ventilation.

- **Enclosing walls**

**Before you enclose a wall, label the wall surface "lead-based paint."** This will alert anyone who works on the wall later on that they are disturbing lead-based paint.

Both sound walls and damaged walls can be enclosed. Enclosure is recommended where the substrate (wall material) is damaged. Before you install an enclosure, you have to get rid of all moisture sources and let the walls dry out.

#### **Fur out the wall.**

When plaster is damaged, you must install enclosure material to studs or furring strips. Furring strips are thin strips of wood you fasten to the studs. This way, even if the plaster fails, the enclosure will stand. Furring strips should be attached with adhesive **and** screws into the studs. Putting up furring strips is called "furring out the wall."

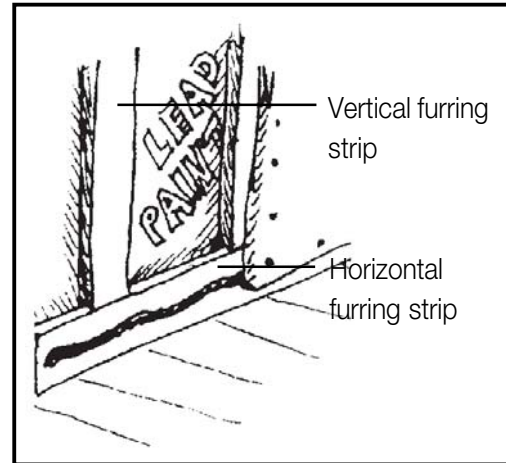
**Encapsulate or enclose walls.**

**Prepare the wall with wet scraping and clean.**

**Label the old wall "LEAD-BASED PAINT" before you enclose it.**

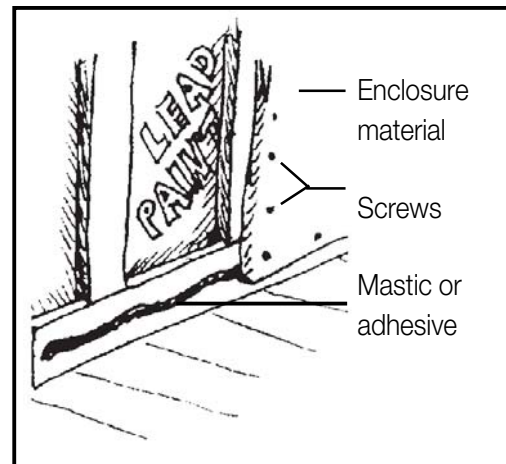


- First lay out a horizontal furring strip along the base of the wall.
- Then put up vertical furring strips. Line them up with the studs.



### Fasten the enclosure material.

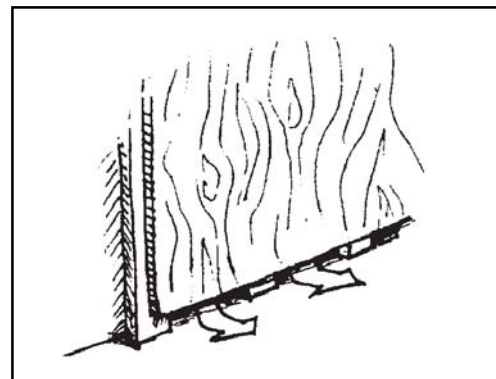
Fasten the enclosure material to the studs. If you furred out the wall, fasten the enclosure material to the furring strips. Use both adhesive and screws. If the wall is plaster on masonry and the plaster is sound, the enclosure material can be attached with a combination of mastic and masonry fasteners.



### Create a dust-tight seal.

### Create a dust-tight seal.

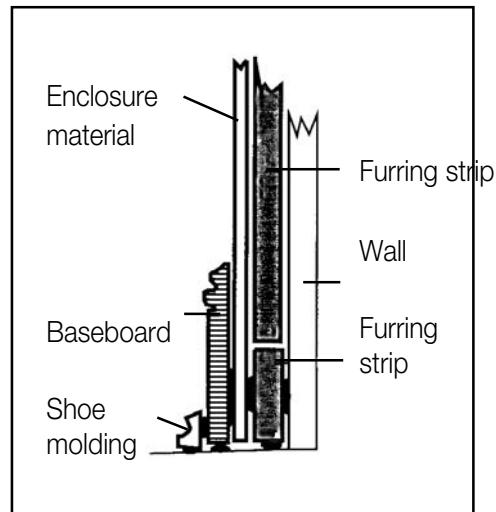
Paint deteriorates more quickly behind an enclosure. All edges of an enclosure—especially the bottom—must be sealed well. If you don't create a good seal, lead dust will leak out.





### Seal the bottom edge.

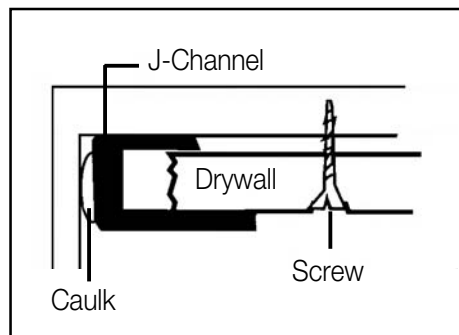
- Caulk the enclosure material at the bottom.
- Back-caulk and nail the baseboard in place.
- Back-caulk, bottom-caulk, and nail the shoe molding in place.



Seal the edges—especially the bottom.

### Seal the seams and other edges.

- Back-caulk all the seams that aren't taped and spackled. Use a high quality adhesive caulk.
- Use a “J-channel” where drywall meets a finished surface. A J-channel is a final strip you attach to the rough edge of drywall to make a finished edge. It's called a “J-channel” because of its shape. Caulk the outside edge so it seals with the finished surface. Screw the drywall in place.



- **Replacing walls**

Replacing drywall and plaster is extremely messy and expensive. Sometimes it is the most practical solution—for example, when partition walls will be built or new electric, plumbing, or heating systems will be installed within a wall.

**Taking out the old walls or wall substrate (plaster) is demolition work.** Follow all worker and environmental protection rules.

- Remove all furniture and personal items.
- Seal off the area.
- Put down a second layer of poly on the floor for added protection.
- Keep area misted to lower dust levels.
- Clean up often and dispose of waste.
- Wear protective suits and respirators and use extra ventilation.

**Interim controls**

If the lead-painted walls are not damaged, flaking, or peeling, you might just wet scrape and repaint them. Remember, paint is not an encapsulant. Repainting is not an abatement method, it is only a temporary solution. When the new paint does chip and peel, the old paint may chip with it. Then it will create lead dust.





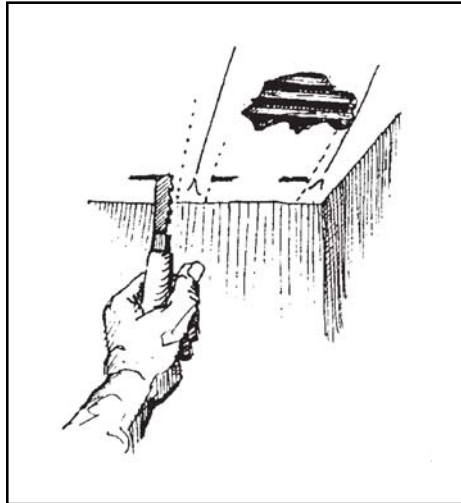
### Ceilings

If a lead-painted ceiling is damaged, it should be enclosed. Replacement is also an option, but it will create large amounts of dust and debris in addition to being much more expensive and difficult to do. Regardless of the type of abatement chosen, the cause of the damage to the ceiling (e.g., leaking plumbing, poor painting preparation, unvented bathroom) **must** be fixed **first**. Ceilings can be enclosed with drywall—or any other type of covering that seals the seams and edges. An enclosure must be dust-tight. It must be sealed along all edges, joints, and seams. **A drop ceiling is not an enclosure.**

#### Ceiling abatement

Never attach the new ceiling to the old ceiling itself. New drywall must be attached to the ceiling beams—called “joists”—with drywall screws. To find the joists, use a drywall dagger and do the following:

1. Cut to the joists on both sides.
2. Mark the center of each joist on the wall.
3. Draw a chalk line across the ceiling from center mark to center mark.
4. Screw the new drywall into the joists along these lines.
5. Tape and spackle all edges.
6. Where new drywall meets a finished surface, use a J-channel.



**Enclose ceilings.**

#### Interim controls

If the ceiling is not damaged, flaking, or peeling, you might repaint it to take care of the lead hazard in the short run. Remember, paint is not an encapsulant. Repainting is not an abatement method. It is only a temporary solution. When the old paint does chip and peel, it will create lead dust.



### Floors

Lead-painted floors are a major source of lead dust. They are impact and friction surfaces. People walk on them. Children and pets play on them. Things get dropped on and dragged around on them. These activities create lead dust.

**Floors should be abated last.** Ceilings, walls, and windows need to be done first. This will reduce the amount of lead dust that gets on the new lead-free floor. The less dust that gets on the floor, the easier it will be to clean at the end of the job.

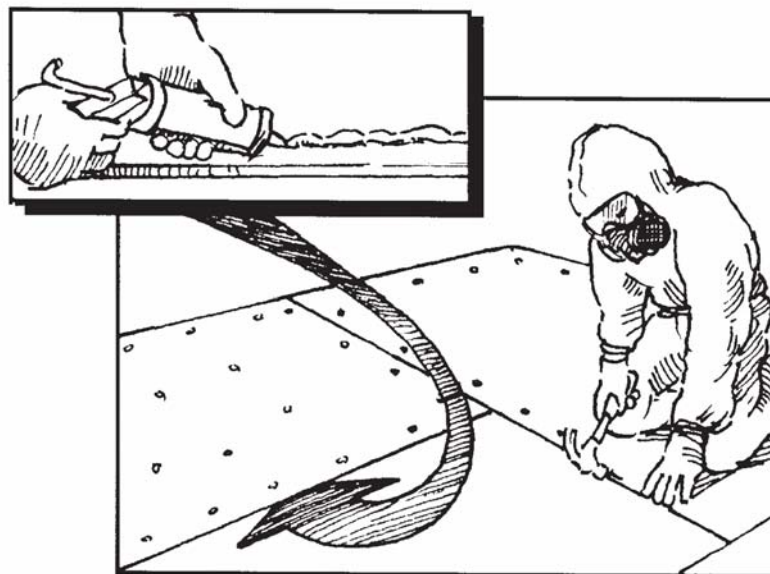
#### Floor abatement

1. **Clean the floor to remove lead dust with an all-purpose cleaner or some other cleaner made especially for lead.**
2. **Install a subfloor before installing the finished floor** (unless you are installing a new tongue-and-groove floor). Use 1/2-inch or thicker plywood or tempered underlayment. Do **not** use masonite. Back caulk the edges, especially the borders. Nail the subfloor down. HEPA vacuum the floor and all cracks. Fill large cracks with a filler that will not turn brittle or break.
3. **Install the finished floor.** You can use vinyl, tile, or wood. (If you use urethane, use extra ventilation and follow instructions carefully.) You can also place carpeting on top of the newly installed floor, but wait until final cleanup is complete before installing. Carpeting alone is not an enclosure. Wall-to-wall carpeting is discouraged in homes with lead-based paint because it is not cleanable.

**Enclose or replace floors.**

**Back caulk and nail in subfloor.**

**Carpets collect more lead dust than bare floors.**





### Carpet removal

Lead dust falls on and sticks to carpet fibers. Lead dust settles under the carpet. Taking out lead-contaminated carpets can be dangerous. You will be exposed to high levels of lead dust.

1. Seal the area from other parts of the house.
2. Wear a respirator and protective clothing.
3. Ventilate the area.
4. Dampen rug and any dust underneath to keep the dust levels down.
5. Wrap up the carpet in 6-mil poly and seal it with duct tape.
6. HEPA vacuum the area and wash over it with an all-purpose cleaning solution.

Carpets contaminated with lead are very difficult to clean. You or your employer should advise the owner of this difficulty. Do **not** remove the carpet without the owner's written permission. If the carpet is not removed, it must be HEPA vacuumed very slowly.

### After the abatement

#### Lead-free floors will collect lead dust.

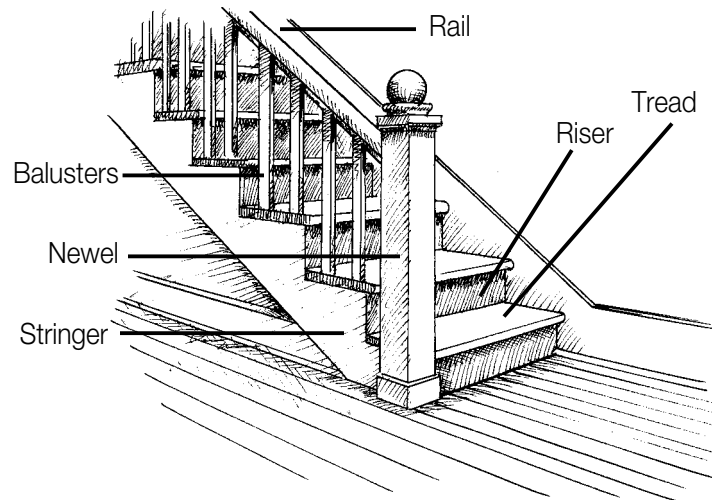
Floors should be abated at the end of the job—after windows, doors, walls, and ceilings. It is very difficult to clean floors of lead dust. Once you finish abating the floor, seal off the area until the final cleanup and a clearance can be done.

**Carpet removal  
can cause high  
levels of lead  
dust to be  
released.**



### Staircases

Staircase abatement can be done in a number of ways. The entire staircase can be replaced—but this is extremely expensive and is generally not recommended. Parts of the staircase can be replaced, while other parts can be enclosed or encapsulated.



#### Staircase abatement

- **Stringers and newels**

Stringers and newels cannot be removed without taking out the whole staircase. This is very expensive. It is better to remove the lead-based paint on site or use an encapsulant that will hold up against impact.

- **Railings, newels, and balusters**

Railings, newels, and balusters can be treated with some encapsulants. However, the rail is a high friction area. An encapsulant may not work on the rail. The outside corners of the newel post and the top edge of the railing may need to be enclosed, wet planed, or chemically stripped.

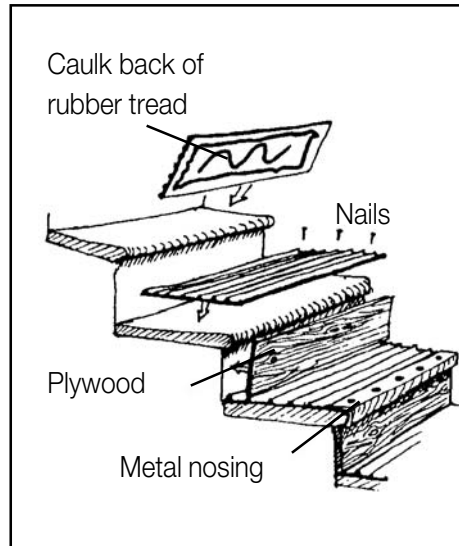
In some cases, the balusters and rails can be removed and stripped off-site or replaced. The paint in between balusters must be removed on-site. As an **interim control** for square railing caps, you could wet-plane them across the top side.



- **Enclose treads and risers.**

A rubber tread with metal nosing works well. Rubber nosing may work, if it fits snugly on the nose of the stair and the stairs are not used very often.

- Enclose risers with thin plywood (such as luan plywood) or some other hard material. Whatever you use must fit snugly.
- Back caulk the edges of treads. Place treads, and nail or screw them down. Screw or nail the metal nosing on.



- **Enclose the whole railing system.**

You can enclose the railing cap, balusters, and newels with plywood or drywall. Then, cap the new system with a wooden rail. This solution changes the design of the room a lot. It also takes a long time, is a lot of work, and is expensive.

### **After abating the staircase**

Once the staircase is abated, cover it with 6-mil poly. Staple down some type of non-slip material on top of the poly for worker safety. You can use cardboard stapled to the treads.

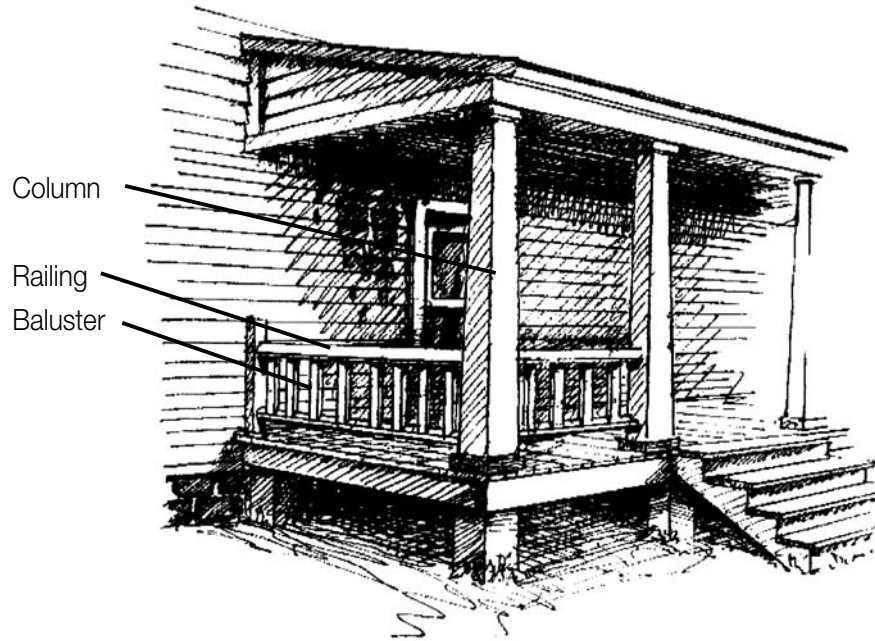


**Lead-painted wooden porches are a serious lead hazard.**

### Porches

Wooden porches with lead-based paint are serious lead hazards because

- surfaces get worn down from weather changes;
- children spend a lot of time there;
- railings are at the right height for kids to put their mouths on.



**Porch floors** should be replaced or enclosed. Use treated planks, treated tongue-and-groove, or exterior or marine-grade plywood. Make sure the floor slants down away from the house. The slant allows water to drain properly.

**Balusters** may be on-site stripped or encapsulated. They are often in such bad shape that they need to be replaced.

**Rails** can be replaced, stripped, or wet planed.

**Structural columns** can be wet scraped, encapsulated, or stripped.

**Lattice** (crisscrossed strips of wood or metal) should be replaced.

**Ceilings** may be enclosed with exterior grade plywood. Remember to back caulk around the edges.



### Outside brick and cement

#### Abatement

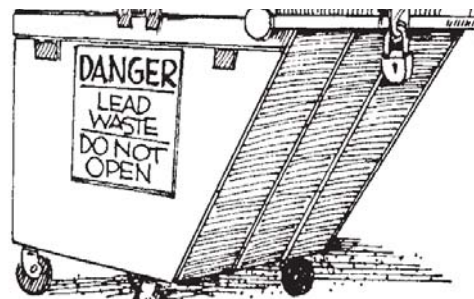
Enclosing outside surfaces with a dust-tight material and vinyl or aluminum siding is often the method of choice. This method provides protection against weathering and increases the efficiency of the house. It also creates less waste than other abatement methods.

Vacuum blasting and contained water blasting may be allowed for outdoor work (your employer must check with the state or tribal agency responsible for regulating residential lead-based paint abatement). Chemical stripping can also be used. These methods are very costly and generate a lot of waste. Waste from water blasting and chemical stripping may be considered hazardous and must be disposed of properly.

When working on outside structures, setup is very important. You need to protect the soil, bushes, and plants, and the surrounding environment. Put 6-mil poly on the ground and seal it to the wall with duct tape or wood trim and masonry nails. There should be no gaps between poly and the building. You need to extend 10 feet of poly in every direction from the surface on which you are working. Place boards under the edge of the poly to create a curb. The curb directs the waste water into a low spot, where it can be pumped into a 55-gallon drum. A disposable tarp may be laid loosely over plants. Put weights around the edge of the tarp to keep it down. Keep all windows within 20 feet of the working surfaces closed, including windows of houses or buildings nearby.

If the outside work includes window treatment or replacement, then one layer of poly should be placed on the ground and extend at least 5 feet beyond the perimeter of the window being treated/replaced. Two layers of poly should be taped to the *interior* wall around the window(s) to prevent dust and debris from getting inside the house.

Clean and take down the entire outside setup at the end of each day. Lock up waste before leaving the work site.




**Interim controls**

Wet scraping is sometimes used to remove loose lead-based paint from outside brick and cement structures. This is a very labor-intensive method. Masonry wet scraping should be done with maximum pressure to remove all paint that has separated from the substrate. Repaint with a high-grade masonry paint, or use an encapsulant recommended for masonry application.







### Key facts for Appendix A

 The four abatement methods used in a home are

- replacement
- enclosure
- encapsulation
- paint removal

 Replacing lead-painted windows, doors and woodwork is a good way to reduce lead hazards.


Back-caulk **and** nail (or screw in) replacement parts when you install them.


 Do not use encapsulants on structurally damaged walls or walls that are separating from the substrate.

 Enclosure is often used for lead-painted floors and ceilings.

Create a dust-tight seal when you enclose a surface.

Back-caulk **and** nail (or screw in) enclosure materials.

 When working on outside structures, setup is very important.

 Interim controls are only temporary solutions.

They are actions you can take to reduce lead dust levels until you do an abatement.

Interim controls should not take the place of abatement.

Interim controls may not be allowed in your state or local area. Check your state and local laws.



## For more information

These publications have more information on the topics covered in this appendix. Your instructor will have a copy of some of the publications. You can order your own copies by calling 1-800-424-LEAD.

EPA, *Regulatory Status of Waste Generated by Contractors and Residents from Lead-Based Paint Activities Conducted in Households*, Interpretive Memorandum (July 2000).

EPA, *Lead: Requirements for Hazard Education Before Renovation of Target Housing; Final Rule*; 40 CFR Part 745 (June 1998).

\*EPA, *Lead: Requirements for Lead-Based Paint Activities in Target Housing and Child-Occupied Facilities*; 40 CFR Part 745 (August 1996).

EPA, HUD, and CDC, *Lead Paint Safety: A Field Guide for Painting, Home Maintenance, and Renovation Work* (June 1999).

EPA, HUD, and CPSC, *Protect Your Family From Lead in Your Home* (June 2003).

\*HUD, *Requirements for Notification, Evaluation and Reduction of Lead-Based Paint Hazards in Federally Owned Residential Property and Housing Receiving Federal Assistance; Final Rule* (September 1999).

\*HUD, *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing* (June 1995).

\*OSHA, *Interim Final Lead in Construction Standard*, 29 CFR 1926.62 (May 1993).

Society for Occupational and Environmental Health, *Protecting Workers and Their Communities from Lead Hazards: A Guide for Protective Work Practices and Effective Worker Training* (1993).