CHAPTER 17: ROUTINE BUILDING MAINTENANCE AND LEAD-BASED PAINT

Step-by-Step Summary

Routine Building Maintenance and Lead-Based Paint: How To Do It

1. Develop a written program assigning responsibilities for controlling lead hazards caused by maintenance work. Train maintenance workers who will be working with lead, covering all the topics listed in this chapter. Change any existing work order forms to include the items in the lead-based paint maintenance work order form contained in this chapter. If no work order is used, develop a system to inform workers when a job may involve a lead hazard or lead-based paint.
2. Determine if lead-based paint is present on the surface where work will be performed. If the surface *has not been tested*, take x-ray fluorescence (XRF) measurements or send a paint chip to a qualified laboratory. If testing cannot be conducted, then it will be assumed that lead-based paint is present on all painted surfaces built before 1978. If some building components are new or were replaced after 1978, it can be assumed that they do not have lead-based paint and maintenance work can proceed normally.
3. Develop a ready-to-use list of those surfaces that are known to contain lead-based paint, if the surface has been tested, using the inventory form in this chapter.
4. Determine whether the individual task is low risk or high risk, using the table in this chapter. High-risk jobs are those that typically produce a significant amount of dust by disturbing more than 2 square feet of a painted surface. Low-risk jobs are those that do not produce much dust by disturbing less than 2 square feet per room.
5. Require the use of disposable 6-mil, polyethylene plastic drop cloths (or equivalent) and thorough cleanup of the immediate work area using wet cleaners. However, *if the job is low risk*, respirators and protective clothing may not be needed.
6. Use respirators; protective clothing; plastic, disposable drop cloths; and work area isolation *if the job is high risk*. High-efficiency particulate air (HEPA) vacuuming should be used in connection with wet cleaning methods.
7. Educate residents on why workers will be taking special precautions before maintenance work begins in the unit. Inform residents that workers need more protection, since they have a higher risk of exposure.
8. Complete work order forms for each job, defining specific protective measures to be used. If no written work order system is used, verbally inform workers of the required protective measures.
   a. For low-risk jobs, put a small sheet of plastic immediately underneath the work area (approximately 5 feet by 5 feet), except for ceiling work. For ceilings, cover the entire floor with plastic. Keep all doors closed and do not let children into the work area.
   b. For high-risk jobs, cover the entire floor with plastic. Remove all furniture or toys from the room or cover them with plastic. Seal the doorway by taping the door closed with light-duty tape or placing a sheet of plastic over the doorway, cutting a slit down the middle, and covering the slit with a second layer of plastic to act as a flap. Relocate children away from the dwelling during the work. Use respirators and protective clothing.

Step-by-Step Summary (continued)

9. Complete maintenance task.
10. Conduct cleaning. For low-risk jobs, wet clean the area twice using a phosphate cleaner or lead-specific cleaner or other equivalent cleaning agent. For high-risk jobs, cleaning should be performed using a HEPA vacuum/wet cleaning/HEPA vacuum cycle.
11. Conduct clearance. Visual assessments are adequate for most low-risk jobs. For high-risk jobs, periodic wipe sampling for every 20th job should be conducted as well. Wipe sampling frequency can be reduced after desirable cleanup practices are established and verified for a particular worker or work crew.

CHAPTER 17: ROUTINE BUILDING MAINTENANCE AND LEAD-BASED PAINT

I. The Relationship Between Building Maintenance Work and Lead Hazard Control Work

This chapter describes how routine maintenance work should be modified to protect workers and residents from lead poisoning and to comply with the Occupational Safety and Health Administration (OSHA) lead standards. Detailed information on worker protection is provided in Chapter 9. Maintenance workers may be covered by either the OSHA Lead Exposure in Construction standard (29 CFR 1926.62) or the OSHA General Industry Lead Standard (29 CFR 1910.1025), depending on the extent and type of job. This chapter describes safe practices for *routine* maintenance, not interim control or abatement work. If traditional, routine building maintenance is performed, surfaces with lead-based paint can be disturbed, turning a potential problem into an immediate problem. However, if maintenance practices are modified to provide sufficient protection to workers and residents, lead hazards associated with maintenance work can be controlled. If the maintenance work does not disturb lead-based paint (or surfaces suspected to contain lead-based paint) or create a dust hazard, then it can proceed in the traditional fashion.

To illustrate the importance of protective measures, even for small-scale jobs, consider how much leaded dust is contained within a 1-square-foot area that is painted with lead-based paint at the U.S. Department of Housing and Urban Development (HUD) minimum regulatory limit (1Êmg/cm ^{2}):

1 mg/cm^2 x (2.54 cm/inch)^2 x (12 inches/ft)^2

x 1,000 μg/mg = 929,000 μg/ft^2

If we assume that more of this dust is cleaned up and that it is distributed evenly over an average room measuring 10 feet x 10 feet, then there would be 9,290 μg/ft^2 on the floor.

This figure can be compared to the HUD clearance standard of 100 μg/ft^2. In short, a significant amount of leaded dust can be released from a small painted area. Even though most maintenance jobs would not turn *all* the lead-based paint into leaded dust (as this calculation assumes), it should be clear that large amounts of lead-contaminated dust can be generated from even low concentrations of lead-based paint. Therefore, protection and thorough cleanup are absolutely essential, even for small-scale jobs.

At the same time, it is not feasible to treat every small-scale maintenance job as if it were an abatement job. The following recommendations balance the need for controlling the hazard with the need to perform “routine” maintenance work in a practical way.

The purpose of maintenance work is different from lead hazard control efforts. Maintenance work is designed to simply keep buildings in good repair. On the other hand, lead hazard control efforts are designed to prevent lead poisoning. While these two goals are different, they are not contradictory. For example, lead hazard control work often results in the creation of smooth, cleanable surfaces that are also easier to maintain. Similarly, good maintenance practices (such as repainting on a regular basis) can help maintain surfaces and thus prevent lead poisoning. Information on lead hazard control work (interim controls and abatement) and worker protection during this type of work are provided in other chapters.

II. Summary of Protective Measures for Low- and High-Risk Maintenance Tasks

To determine the extent of protective measures needed, the task should be classified into low or high-risk categories. Table 17.1 provides general guidance on classifying jobs based on how much dust each is likely to generate. The classification should be made on a case-by-case basis, since the surface area treated and the existing condition of the paint will be different for each job.

Once the job has been classified, protective measures can be determined. Table 17.2 summarizes protective measures for those tasks that are either low- or high-risk. Adjustments should be made depending on the size of the area to be disturbed. If more than 2 square feet are disturbed in the room, an increased degree of protection is usually needed. If the surface area to be disturbed is smaller, protective measures can be downgraded (but not eliminated entirely). If the paint is deteriorated, more protective measures may be needed.

Tables 17.1 and 17.2 should be used on a case by case basis. Each job may present unique

Table 17.1 Summary of Low- and High-Risk Job Designations for Surfaces Known or Suspected To Contain Lead-Based Paint.

Job Description	Low Risk	High Risk*
Repainting (includes surface preparation)		▮
Plastering or wall repair		▮
Window repair		▮
Window pane or glass replacement only	▮	
Water or moisture damage repair (repainting and plumbing)		▮
Door repair	▮	
Building component replacement		▮
Welding on painted surfaces		▮
Door lock repair or replacement	▮	
Electrical fixture repair	▮	
Floor refinishing		▮
Carpet replacement		▮
Groundskeeping	▮	
Radiator leak repair	▮	
Baluster repair (metal)		▮
Demolition		▮

* High-risk jobs typically disturb more than 2 square feet per room. If these jobs disturb less than 2 square feet, then they can be considered low-risk jobs.

Table 17.2 Summary of Protective Measures For Low- and High-Risk Jobs

Protective Measure	**Low Risk**	**High Risk**
Worksite preparation with plastic sheeting (6-mil thick)	Plastic sheet no less than 5 feet by 5 feet immediately underneath work area	Whole floor, plus simple airlock at door or tape door shut
Children kept out of work area	Yes	Yes
Resident relocation during work	No	Yes
Respirators	Probably not necessary*	Recommended
Protective clothing Note: Protective shoe coverings are not to be worn on ladders, scaffolds, etc.	Probably not necessary*	Recommended
Personal hygiene (enforced hand washing after job)	Required	Required
Showers	Probably not necessary	Recommended
Work practices	Use wet methods, except near electrical circuits	Use wet methods, except near electrical circuits
Cleaning	Wet cleaning with lead-specific detergent, trisodium phosphate, or other suitable detergent around the work area only (2 linear feet beyond plastic)	HEPA vacuum/wet wash/HEPA vacuum the entire work area
Clearance	Visual examination only	Dust sampling during the preliminary phase of the maintenance program and periodically thereafter (not required for every job)

* Employers must have objective data showing that worker exposures are less than the OSHA permissible exposure limit of 50$\mu g/m_3$ if respirators and protective clothing will not be provided.

situations that should be considered by the maintenance supervisor. For example, even though Table 17.1 suggests that repainting is a high-risk activity, it does not necessarily mean that *all* repainting jobs are considered high risk. If the painting job involves only minor touchup (less than 2 square feet per room) or there is no scraping or sanding involved, that particular painting job may be considered low risk. More detailed descriptions of each protective measure are provided later in this chapter.

III. Ways in Which Maintenance Work Can Create or Intensify Lead Hazards

There are a variety of ways in which maintenance work can inadvertently create lead hazards where none previously existed or worsen hazards that are already present.

A. Paint Abrasion or Other Disturbance

The most common problem involves maintenance work that disturbs or rubs against a painted surface. Common activities such as sanding, scraping, hammering, cutting, or grinding on surfaces coated with lead-based paint or lead-contaminated dust can create large exposures. Torch cutting or welding on painted metal surfaces is especially dangerous and is prohibited under OSHA regulations (the paint must be removed before torch cutting or welding). Although most individual maintenance jobs do not last very long, it is possible to cause a significant exposure for the worker and the occupant. For example, power sanding on lead-based painted surfaces has been found to cause exposures as high as 11,000 $\mu g/m^3$ in the residential setting (Jacobs, 1991b), which is well above the OSHA permissible exposure limit (PEL) of 50 $\mu g/m^3$. Other typical tasks, such as carpet removal, have also been shown to result in exposures well above the OSHA PEL, depending on how long the exposures last (NIOSH, 1990). While there is not adequate information on exposures during routine maintenance jobs, exposures can be kept well below the limit if the work is carefully conducted (NIOSH, 1990). In other words, paint deterioration should no longer be regarded as a minor cosmetic problem.

B. Water Damage

Water damage can occur from sudden circumstances, such as bursting pipes, overflowing tubs and sinks, broken fixtures, or storm damage. Water damage can also occur from less obvious problems, such as condensation, slow leaks in pipes or fixtures, improper building drainage around the perimeter, or accidental resident neglect (e.g., leaving the windows open during rain). Both conditions can lead to paint failure, either by deterioration of the paint itself, or deterioration of the substrate behind the paint. In traditional maintenance work, it is customary to repair only the source of the water leak, especially in emergency situations. In some cases, the paint deterioration may not be evident until several weeks following the water leak repair and it may be left to the resident to repaint.

If lead-based paint is known or suspected to be present, however, paint deterioration deserves as much attention as the hole in the roof would receive. The paint should be repaired as quickly as possible using controlled work practices.

C. Dust Exposures

Many types of maintenance work can release substantial quantities of dust into the residence. Examples include repainting, floor sanding, window repair (window troughs often contain very high levels of leaded dust), and plastering. Typical maintenance practices employ the use of drop cloths and cardboard or newspapers to protect furniture, eating surfaces, and walkways. If the drop cloths are made of canvas, they may become full of leaded dust, possibly contaminating the next worksite. Poorly controlled dust during maintenance work has accounted for numerous cases of childhood lead poisoning (Farfel, 1990; Amitai, 1991; Rabinowitz, 1985a;

Shannon, 1992).

Lead-contaminated dust exposures to both children and adults can be controlled by the following:

- ☞ Using wet methods.
- ☞ Covering furnishings with disposable, plastic drop cloths.
- ☞ Using foot coverings or dedicated footwear to minimize tracking of leaded dust out of the work area.
- ☞ Sealing rooms to avoid contamination of adjacent areas.
- ☞ Using approved respirators.

D. Groundskeeping

If the soil is contaminated, certain groundskeeping activities can pose a risk to workers and occupants. Excavation to lay new pipes, regrading, or sodding disturbs the soil. Bare soil can be more easily tracked into dwellings where it becomes part of the house dust and where a child

can become exposed to it. If the soil is known to contain high concentrations of lead or has yet to be tested, simple protective measures can be introduced to control exposures. Keeping the soil wet is usually effective, as long as proper erosion control measures are established. Disposable shoe coverings or dedicated workshoes will prevent tracking contaminated soil into dwellings, worker's automobiles, and maintenance shops.

IV. Maintenance Program Elements

This section describes how a maintenance program addressing lead-based paint hazards can be developed that clearly assigns the various responsibilities. The following responsibilities need to be assigned to a specific individual:

- Determining whether a specific job will disturb known or suspected lead-based painted surfaces.
- Determining whether a specific job will be low- or high-risk.
- Training workers.
- Purchasing supplies and equipment, including respirators, plastic sheeting, special cleaners, disposable shoe coverings, protective clothing, etc.
- Conducting visual assessments on all jobs to ensure adequate cleanup.
- Conducting wipe tests on some jobs to ensure adequate cleanup.
- Handling communication with residents. For small staffs, all of these responsibilities may be handled by a single person; for larger staffs, coordination is essential.

A. Identification of Lead-Based Painted Surfaces

Individuals assigning maintenance tasks will need to determine whether work on certain surfaces will result in a lead hazard. The best method for doing this is to list all painted surfaces and then have an inspector technician determine whether lead-based paint is present (using the protocols in Chapter 7).

However, in many instances, such an inspection will not have occurred yet or was deficient (for example, a previous investigation may not have inspected every similar painted surface in each room). Therefore, it may be necessary to make assumptions. *All painted surfaces in dwellings constructed before 1978 should be presumed to contain lead-based paint, until proven otherwise.* While this assumption could result in erroneously requiring controls for working on paint that does not contain lead, it would be dangerous to assume that the paint does not contain lead until an inspection shows that it does. In the latter case, a maintenance supervisor could fail to recommend controls where they are needed, resulting in a poisoned worker or child.

It is important to note, however, that not all painted surfaces in all dwellings constructed before 1978 will contain lead. If it is *known* that certain building components are relatively new or were replaced or added after 1978, it can be assumed that they do not contain lead. For example, if all exterior doors and windows in a building are known to have been replaced in 1981, these surfaces need not be included in the inventory of known or suspected surfaces.

Form 17.1 at the end of this chapter can be used as an inventory form.

An inventory for a single room might look like the example above. Since floors were not painted in this example, floor work is unlikely to produce a lead hazard. Lead-based paint is known to exist on the window troughs because of historical records on exterior paint. Baseboards and doors were replaced after 1978, so it is doubtful that they contain lead-based paint. All other surfaces are listed as "suspect" surfaces, since they have not been tested.

Depending on the size and organization of the maintenance operation, the inventory could be organized by room (appropriate for small owners with only one or a few single-family dwellings) or by unit/apartment building (appropriate for

Figure 17.1 Example of a Lead-Based Paint Inventory.

Dwelling Unit Identifier_____

Room Identifier_____

Surface	Known Lead-Based Paint	Suspected Lead-Based Paint	No Lead-Based Paint
Floors			▤
Lower walls		▤	
Upper walls		▤	
Chair rail		▤	
Interior window trim		▤	
Window trough	▤		
Ceiling		▤	
Baseboards			▤
Doors			▤
Door trim		▤	
Crown molding		▤	
Other trim mantels, etc.		▤	
Exterior siding	▤		

larger landlords). For computerized maintenance systems, the lead-based paint inventory system can be added to the database to flag those jobs that could produce lead hazards. If workers or supervisors are unsure about whether or not they are working on a leaded surface, they can quickly consult the inventory.

B. Identification of Low- and High-Risk Jobs

Most maintenance work is unpredictable. Some repair jobs start small but then escalate. Replacement of a ceiling light fixture is an example of a relatively small job that can become a large job if a section of the ceiling falls apart when the fixture is removed.

Maintenance or building supervisors or others who categorize work orders should determine if the job entails a low or high risk of exposure to lead and leaded dust according to the guidance in Table 17.1. Protective measures should also be determined according to the guidance in Table 17.2. Some training is usually necessary to make these judgments.

C. Training

Since most maintenance supervisors and workers are not typically trained to recognize and correct lead hazards in the course of their regular duties, it may be difficult or impossible for maintenance personnel to determine the level of control necessary for a particular job. Presently, no formal U.S. Environmental Protection Agency (EPA) training curriculum specifically targeted at maintenance personnel exists, although a number of such courses have been developed and provided (AFSCME, 1993; Jacobs/

HES, 1992; SOEH, 1993). In addition, the OSHA Hazard Communication Standard (29 CFR 1910.1200) requires training of individuals who are exposed to hazardous substances during their work. Both the OSHA Lead Exposure in Construction standard (29 CFR 1926.62) and the OSHA General Industry Lead Standard (29 CFR 1910.1025) require training. The National Institute of Building Sciences has recently developed an operations and maintenance manual on lead-based paint (call (202) 289–7800).

Maintenance workers and supervisors who deal with lead-based paint hazards should receive a 1- or 2-day training session at their job site that includes hands-on practice in implementing various control measures. The training should include a discussion of how the maintenance program at the facility will be modified to reflect potential lead hazards, and who will make the decisions. The training should emphasize that maintenance workers are not permitted to perform abatement work unless they have completed the State-approved EPA lead-based paint abatement training course(s). Newly hired or trained supervisors or workers should be closely monitored to ensure that appropriate controls are established. Sources of training are provided in Chapter 2.

If outside contractors are employed to conduct maintenance work, they must also be trained and notified if their work will disturb lead-based painted surfaces. Proof of contractor staff training should be verified by the owner before any maintenance work is undertaken.

At a minimum, the training should cover the following topics:

- Definition of lead and lead-based paint hazards.
- Lead health effects.
- Regulations.
- Modifications to existing maintenance operations.
- Listing of known or suspected surfaces containing lead-based paint.
- Methods of identifying lead.
- Distinguishing between low- and high-risk jobs.
- Work practices (use of tools, HEPA vacuums, wet methods, and so forth).
- Prohibited methods of removing lead-based pain include: open-flame burning or torching, machine sanding or grinding, uncontained hydroblasting or high-pressure wash, abrasive blasting or sandblasting, and heat guns above 1100 °F. Methylene chloride strippers and dry scraping are also not recommended.
- Personal hygiene.
- Worksite preparation.
- Respirator program and fitting.
- Medical surveillance.
- Cleanup and post-job visual inspection.
- Clearance procedures.
- Waste handling and storage.
- Resident relations.

An accredited lead training provider should conduct the training. The training can also be conducted by a licensed risk assessor; a certified industrial hygienist, nurse, or physician; or another qualified adult educator. If necessary, maintenance supervisors can provide the training if they have completed the EPA supervisor course.

D. Education of Residents

Maintenance workers may be required to use respirators and protective clothing in occupied units, erect containment systems, and use special equipment; therefore, residents must be informed about the reasons for these measures. It is important that all elements of the lead hazard control plan be fully developed to reassure residents that no hazards will be created as a result of the work. Local health departments and childhood lead-poisoning prevention programs

can assist owners in properly educating residents about lead health hazards.

E. Work Order Systems

Work order systems should be modified to reflect whether the job will disturb the lead-based paint, whether the job is low- or high-risk, and which protective measures will be required. Even if an owner does not have a formal work order system developed, the hazard warning information must be transmitted to those conducting the work.

To account for lead hazards, the owner's work order form will need to be modified. Specifically, a check-off box should be added to indicate that the work will disturb known or suspected lead-based paint. If this box is checked, the supervisor or worker should receive a

Figure 17.2 A Typical Work Order Form.

Lead-Based Paint Maintenance Work Order Form

Reference to work order number _____

Respirator required? ____ Yes ____ No

Protective clothing required? ____ Yes ____ No

Size of plastic sheeting to be placed under work area _____

Cover whole floor with 6-mil plastic sheeting? ____ Yes ____ No

Cover doorway to room with plastic sheeting and construct airlock? ____ Yes ____ No

Tape door shut? ____ Yes ____ No

Move furniture out of room? ____ Yes ____ No

Shut down HVAC system? ____ Yes ____ No

Wet down item to be repaired? ____ Yes ____ No

(CAUTION: Do not wet down areas near electrical circuits.)

Relocate occupant? ____ Yes ____ No

Cleanup:

HEPA vacuum needed? ____ Yes ____ No

Disposal of waste will be done by _____

Visual inspection of cleanup by supervisor:

____ Sufficient ____ Repeat cleaning

Dust sampling required after task is completed? ____ Yes ____ No

Modifications to work _____

Work assigned by _____

Work completed by _____

Final inspection by _____

Date of completion _____

second form with detailed information on required work practices and control measures required. A standard Lead-Based Paint Maintenance Work Order Form is shown in Figure 17.2, which can be added to the existing maintenance form.

F. Written Program: Assignment of Responsibilities

When the five elements of the maintenance program (described above) have been assembled, a management plan should be put into writing. The plan should authorize specific individuals to perform the following functions:

1. Develop and maintain a list of all suspect and known lead-based painted surfaces.

2. Determine those jobs that pose low and high risks.

3. Train maintenance workers, supervisors, and managers, and implement respiratory protection and medical surveillance programs.

4. Provide notification to residents about lead-based paint maintenance work.

5. Complete work order forms and lead-based paint maintenance work order form.

6. Purchase supplies and equipment, including respirators, plastic sheeting, special cleaners, and protective clothing.

7. Designate those workers permitted to work on lead-based painted surfaces.

8. Conduct wipe tests and visual assessments to determine whether the cleaning in a dwelling has been adequate following the job.

For small staffs, a single person may handle all of these tasks; for larger staffs, coordination is essential. This program should also be included in an interim control plan, if one exists for the property (see Chapter 11). If there is only a single maintenance person and owner/ supervisor, a written program is not necessary.

V. Methods To Protect Workers and Residents During Typical Maintenance Jobs

Due to the toxic nature of lead, *all* jobs disturbing lead-based paint require *some* protection.

A. Worksite Containment and Occupant Protection

1. Jobs That Do Not Pose a Lead Hazard

Jobs that do not disturb any lead-based paint or that do not create a lead-contaminated dust hazard can be performed in the traditional fashion.

2. Low-Risk Jobs

For low-risk jobs disturbing a small surface area and not generating much dust, worksite containment consists of a relatively small sheet of plastic (no less than 5 by 5 feet) placed underneath the immediate work area. An exception to this rule is ceiling work where dust contamination is likely to be widespread. For most types of ceiling work, the entire floor and all furnishings should be covered with plastic.

Doors to the work area should be kept closed until cleanup has been completed. The gap at the bottom of the door should be taped shut. Children are not permitted in the work area until the supervisor has visually inspected the cleanup. However, children may be present in adjoining rooms and need not be removed from the entire dwelling (although relocation is preferable). Worksite Preparation Level 1 should be adequate (see Chapter 8).

3. High-Risk Jobs

For those jobs that are high risk and that disturb a large surface area, a more involved worksite containment procedure is required. Typically, the whole floor should be covered with plastic sheeting. Furniture, toys, and other belongings should be either moved out of the room or covered with plastic sheeting. A simple airlock

should be constructed at the entryway to the room. (If two entryways exist, one should be completely sealed in plastic.) The airlock consists of two sheets of plastic. One sheet is completely taped along all four edges. The tape must extend all the way around the top, two sides, and the floor. This plastic sheet is then cut down the middle. The second sheet is only taped along the top and acts as a flap covering the slit in the first sheet of plastic. As an alternative, the doorway can be taped on all sides. A weak tape should be used so that workers can quickly break the tape seal in the event of an emergency.

Children should be temporarily relocated from the dwelling while the work is proceeding. If more than 1 day is required to complete the work, a supervisor must have a thorough cleanup conducted, followed by a visual examination, at the end of each workday. Children and residents are permitted to reenter the dwelling at the end of the workday, after the dwelling has been completely cleaned and visually inspected. A high-risk job should be followed by HEPA vacuuming, wet washing with a suitable cleaner, and repeated HEPA vacuuming (see ChapterÊ14).

B. Respirators

1. Low-Risk Jobs

Respirators are not required unless time-weighted average exposures are greater than 50 $\mu g/m^3$ as an 8-hour, time-weighted average. Unfortunately, virtually no data exist that characterize maintenance worker exposures. Chapter 9 noted that OSHA requires respirators to be used whenever certain tasks are performed, unless air sampling demonstrates that exposures are low. These tasks include the following:

- Manual demolition.
- Manual scraping.
- Manual sanding.
- Heat gun use.
- Power tools (belt sanders, needle guns, and so forth).
- Spray painting with lead-based paint.

Manual scraping and sanding should be performed only after the surface has been moistened. Power tools should be used with HEPA local exhaust vacuum systems. Since typical maintenance worker exposures may not exceed the permissible limit, half-face air purifying respirators equipped with HEPA cartridges should be used even for small jobs while the surface is being disturbed. The use of respirators for this brief time period is not particularly burdensome and is likely to provide significant protection.

Respirators must be used in conjunction with a respirator program (29 CFR 1910.134) that requires respirators to be fitted to the individual, cleaned and stored properly, and used within their design limits by individuals medically fit to use them (as determined by a physician), among other requirements.

2. High-Risk Jobs

Respirators are required for all high-risk jobs. If an unusually high level of leaded dust is expected to be generated, a full-face powered air-purifying respirator should be used.

C. Protective Clothing

1. Low-Risk Jobs

Protective clothing is not required for low-risk jobs. However, workers must not wear their work clothing home and should ensure that their clothing is laundered separately from their family's clothing.

Protective clothing should be worn if a low-risk job disturbs more than 1 square foot.

Workshoe disposable coverings should be worn to avoid tracking leaded dust throughout the dwelling, unless work will be conducted on ladders. Shoe coverings are not recommended for situations that create a significant risk of workers falling or slipping.

2. High-Risk Jobs

Protective clothing and protective footwear are required for all high-risk jobs.

D. Personal Hygiene and Showers

1. Low-Risk Jobs

Many studies have revealed that poor personal hygiene of workers during lead hazard control jobs can cause lead poisoning. Therefore, thorough washing of the hands and face is required even for low-risk jobs disturbing less than 1 square foot. Eating, smoking, drinking, and applying cosmetics while in the work area should not be permitted. Hand-to-mouth contact should also be minimized. For low-risk jobs, showers are not required.

2. High-Risk Jobs

For high-risk jobs, showers should be taken at the maintenance shop before the worker leaves at the end of the day. Thorough washing of the hands and face should be completed before all breaks (meals, etc.). If showers are not provided, workers should change their clothing and put the contaminated work clothing in a plastic bag for separate cleaning.

E. Work Practices

Protective work practices are the same for both low- and high-risk jobs. Surfaces should be wetted when possible to retard the entrainment of leaded dust into the air. A garden sprayer or pump/squeeze bottle can be used for this purpose. Enough water should be used to just coat the surface; use of excessive water can cause runoff and substrate damage. Work should proceed carefully and deliberately to reduce the amount of dust generated. Wet methods *must not* be used near electrical circuits due to electrocution hazards. Children are not permitted in the work area until after completion of all cleanup and final visual inspection.

F. Cleaning

1. Low-Risk Jobs

A HEPA vacuum is not required for low-risk jobs, since all the leaded dust will be caught by the plastic sheeting. However, limited wet cleaning with trisodium phosphate detergent or other lead-specific cleaners or equivalent should be performed twice on all horizontal surfaces at least 2 linear feet beyond the plastic in all directions. Vertical walls or other building components near the work area should also be cleaned. A mild detergent can be used on those surfaces where the finish is likely to be marred by the use of trisodium phosphate. There should be no visible dust in the cleaned area. Brooms should not be used to clean up dust; only wet methods are recommended.

2. High-Risk Jobs

A HEPA vacuum is required for cleanup of high-risk jobs. The entire room should be cleaned following the full HEPA vacuum/wet wash/HEPA vacuum cleanup method described in Chapter 14. Cleaning should proceed from clean to dirty areas and from ceiling to floor. All surfaces in the room that were not covered with plastic should be cleaned. Finally, the floor should be cleaned after the plastic has been removed. The cleaning solution should be changed frequently (at least after each room is cleaned, more frequently, if needed).

G. Clearance

1. Low-Risk Jobs

For low-risk jobs, a visual inspection conducted by a trained supervisor is sufficient. The supervisor should ensure that all required work has been completed and that there is no visible dust in the immediate vicinity of the work area.

2. High-Risk Jobs

For high-risk jobs, clearance dust sampling is recommended for at least every 20th job, in addition to visual examination for every job (see Table 15.1).

H. Waste Disposal

Since maintenance work is part of the routine operations in a dwelling, any waste generated is considered ordinary household refuse and is not regulated under the Resource Conservation and Recovery Act as hazardous waste. Depending on the interpretation of the local regulatory

agency, permits may not be required to dispose of waste generated as a result of ordinary maintenance and repair work.

However, the waste can still pose a threat to youngsters who gain access to it. All waste generated as a result of lead-based paint maintenance work should be sealed in a container or plastic bag and stored in a secure, locked area until final disposal. In addition, solid waste should be wrapped in plastic to prevent any release of leaded dust during transport out of the dwelling and to the final disposal site. Lead-contaminated waste should be disposed of in a lined landfill.

Form 17.1

Inventory Form

Dwelling unit address_____

Room or area identifier_____

Surface	**Known Lead-Based Paint**	**Suspected Lead-Based Paint**	**No Lead-Based Paint**
Floors			
Lower walls			
Upper walls			
Chair rail			
Interior window trim			
Window trough trim			
Ceiling			
Baseboards			
Doors			
Door trim			
Crown molding			
Other trim (molding, mantels, etc.)			
Cabinets			
Radiators			
List all other surfaces here:			