

LEAD-BASED PAINT (LBP)

OPERATIONS AND MAINTENANCE (O&M) PROGRAM

SAMPLE

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1.0 INTRODUCTION

Construction of the property improvements occurred prior to 1979; therefore, LBP may be present. Any materials known to be or suspected of containing LBP should be included in the Operations and Maintenance (O&M) until or unless sampling indicates them to not contain regulated levels of lead. The first step in controlling LBP in building occupant exposure to lead dust or particulate is to develop and implement an LBP O&M.

The United States Environmental Protection Agency (EPA) and the Department of Housing and Urban Development (HUD) recommends a pro-active, in-place management program whenever lead-based paint is discovered. In many cases, a well-run LBP O&M Plan may be all that is necessary to control the release of lead dust until the surface containing lead-based paint are abated as part of renovation or demolition activities. If lead-based paint is properly managed, releases of lead are minimized. The exposure to lead, and therefore the risk of lead-related health concerns, can be reduced to a negligible level for all building occupants. Guidelines for generating an effective O&M Plan were outlined by the EPA in *Protect Your Family From Lead in Your Home*, May 1995 and guidelines for renovation are outlined by the EPA in *The Lead-Safe Certified Guide to Renovate Right*.

There are four primary objectives of any O&M Program: (1) clean up existing LBP hazards, (2) minimize future hazards by properly maintaining lead-painted components, (3) maintain LBP until it is eventually removed, and (4) monitor the condition of the LBP. Recommendations for the cleanup of existing hazards for each property will be addressed in addendum once a LBP hazard risk assessment has been completed by a properly trained individual. However, any or all of the responsibilities and duties of this manual can be managed by an outside source knowledgeable of these practices.

This O&M Program is not a permanent solution; its goal is to eliminate lead hazards until such time as buildings are eventually renovated or demolished. The O&M Program likewise is not a means by which full-scale LBP abatement is accomplished. Rather, intentional disturbance of LBP should be limited to repair or removal of small areas of significantly damaged LBP, or repair and cleanup of vacant units for washing or repainting. Large abatement projects that require extensive planning and technical expertise are beyond the scope of this O&M Program and should be handled by a professional consulting firm experienced in LBP abatement projects.

SOURCES OF LEAD PAINT DUST

1. BREAKING SURFACES

- Lead paint is usually below several layers of non-lead paint.
- Left unexposed/undamaged, it produces little if any dust.
- Some practices produce so much lead dust that they should always be avoided.
 - Do not dry sand. Power sanding is most dangerous
 - Do not dry scrape.
 - Do not burn.
- Removal of cabinets, window trim, etc. produces dust when paint joints are broken.

- Removal also may release large amounts of dust and chips that have accumulated behind objects or molding being removed.
- Demolition creates large quantities of dust.
- Stripping creates toxic paste which releases toxic dust when dried.
- Heat guns are permitted but not encouraged.

2. MAJOR FRICTION AND IMPACT POINTS

Windows

- Paint deteriorated from moisture/weather
- Sash rubbing jamb, stop, and parting bead
- Sash banging against well and parting bead
- Impact against edge of stool

Stair / Floor

- Floor boards
- Stair treads

Paint exposed through walking, moving objects, and impact against risers, treads and newel post

3. MOISTURE

Moisture is a major cause of paint failure. Moisture usually attacks the painted surface from behind the paint.

Exterior Surfaces

- Sun, heat, cold, rain cause paint failure, flaking and peeling
- Some exterior paint is designed to chalk
- Clogged or separated gutters and downspouts damage paint
- Standing water on porch floors, window wells and sills damage paint
- Moisture from inside house migrating to behind exterior paint damages paint

Interior Surfaces

- Steam / moisture from cooking and washing
- Roof and roof flashing leaks
- Plumbing leaks
- Rain water entering walls
- Condensation in ceilings and walls
- Water splashed in kitchen and bath
- Dampness from crawl space

4. PAINT AND SUBSTRATE FAILURE

- Paint applied to glossy or greasy surface
- Plaster pulling away from lath
- Wallpaper separation
- Incompatible paint on paint
- Rotting or termite damage wood

5. "UNCLEANABLE," UNSEALED SURFACES

- Lead dust gathers in cracks. It builds up behind cabinets, between floor boards, behind molding, under baseboards, etc.
- If the dust is not removed, movement, impact, outside wind pressure etc. will spread this dust even after surface cleaning and dust wipe clearance. These areas need to be cleaned crack by crack, filled or sealed, and made smooth and cleanable

2.0 PERIODIC LBP SURVEILLANCE

Periodic review of the O&M Program is essential to ensure that the program objectives are being met. A key feature of the review is periodic inspection of all LBP in the property. Combined with ongoing reports of changes in the condition of the LBP made by services workers, the periodic inspection will ensure that any damage or deterioration of the LBP will be detected and corrective action taken. Periodic inspection should be conducted at least annually.

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3.0 NOTIFICATION

Once the presence of LBP has been established in a property, a notification and warning system should be initiated. The notification and warning program serves two purposes:

1. It alerts affected parties to a potential hazard.
2. Building occupants, maintenance personnel and others who are aware of the presence of LBP are less likely to disturb LBP and create a dust or particulate release.

Notification of building occupants and other affected individuals can be accomplished in several ways. Two common techniques are:

1. Distributing notices, and
2. Holding awareness or informational seminars.

The distribution of notices is an effective means of alerting building occupants about the presence of LBP. Memos or letters can be tailored to specific parties, and verification that notification was received is easily accomplished. Detailed reports can be sent to management as well as maintenance personnel, discussing the information pertinent to the successful implementation of an O&M Program.

Awareness or information seminars designed to follow written notification should be conducted by professional consultants, training centers, or the LBP Program Manager. These seminars serve to expand on relevant information while allowing attendants to raise questions. These seminars can also be developed at the same time as other training programs, and typically last no more than several hours.

Regardless of the notification format chosen, building occupants should be provided with the following information, at a minimum:

- What LBP is and how it is typically used
- Health effects associated with exposure
- What types of LBP are present in the facility
- The locations of these materials
- How individuals can avoid disturbing LBP
- How to recognize and report damage
- How custodial and maintenance personnel are dealing with these materials to minimize dust
- What will be done periodically and over the long run to protect the health and safety of the building occupants
- The name and telephone number of the LBP Program Manager

4.0 MAINTENANCE/RENOVATION PERMIT SYSTEM

The purpose of the Maintenance/Renovation Permit System is to:

1. Ensure that the LBP Program Manager is aware of any project planned that could disturb LBP and,
2. Ensure that the LBP Program Manager sets up the proper controls so that LBP disturbance is minimized during the project.

Any person requesting to do work within a property must be required to submit a work order or Job Request Form (See Figure 4-1) to the LBP Program Manager before the work is initiated. This form gives the time and location of the planned activities, the type of activity, as well as any known information concerning LBP present in the work area. Based on this information and his knowledge of where LBP is located, the LBP Program Manager shall decide as to how the requested maintenance activity shall be accomplished.

If, based on the LBP Program Manager's review, it is determined that the project will not likely disturb any LBP, the Program Manager should note the presence of LBP on the work permit, stress the importance of not disturbing the LBP, and return the work permit to the person who initiated it.

If, based on the LBP Program Manager's review, it is determined that the project will likely disturb LBP, the Program Manager should annotate this on the work permit and issue a Maintenance Work Authorization Form (See Figure 4-2). Copies of both the work permit and the work authorization must be kept in the LBP Program Manager permanent file.

4.1 Job Request Form

No: _____

Name: _____ Date: _____

Telephone No: _____ Job Request No: _____

Requested Start Date: _____ Anticipated Finish Date: _____

Building, room number(s), or description of area where work is to be performed:

Description of Work:

Description of any LBP that might be affected, if known:

Submit this application to:

(LBP Program Manager)

Note: An application must be submitted for all maintenance work whether or not LBP might be affected. An authorization must be received before any work can proceed.

_____ Granted (Job Request No. _____)

_____ With Conditions *

_____ Denied

*Conditions:

4.2 Work Authorization Form

No.: _____

Authorization

Authorization is given to proceed with the following maintenance work:

Presence of LBP

_____ LBP is not present in the vicinity of the maintenance work.

_____ LBP is present, but its disturbance is not anticipated; however, if conditions change, the LBP Program Manager will re-evaluate the work request prior to proceeding.

_____ LBP is present, and may be disturbed.

Work practices if LBP is Present

The following work practices shall be employed to avoid or minimize disturbing LBP:

Personal Protection if LBP is Present:

The following equipment/clothes shall be used during the work to protect the workers:

Special Practices and/or Equipment Required:

Signed: _____ Date: _____

LBP Program Manager

5.0 WORK PRACTICES

Safe work practices will be reviewed in the Lead safe work practices training that must be conducted annually for all communities that have existing LBP O&M programs in place. Sampling data will be reviewed and potential hazards will be discussed as part of this annual training. Course materials will be based on the National Environmental Trainer's Association Lead-safe work practices course for maintenance workers in multi-family housing or an equivalent that is approved by EPA and HUD.

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6.0 RECORD KEEPING

The following records must be kept for this O&M Program:

1. This entire O&M Program (Note: It is recommended that all written elements of the O&M Program be made available for inspection by workers).
2. Plans and drawings for the property.
3. All inspection reports generated for any property or unit.
4. Copies of notification and warning programs, including notices sent to tenants.
5. Training:
 - Name of person trained
 - Job Title
 - Date course was taken
 - Location of course
 - Course instructor
 - Course outline
6. Written Respiratory Protection Program
7. Medical Surveillance records (Note: OSHA requires that each worker's record of medical surveillance be made available to the worker).
8. Maintenance O&M work:
 - Name and signature of the person performing the activity
 - Activity start and completion dates
 - Precise locations
 - Description of the activity and any preventive measures taken, name and location of the storage or disposal site, if any LBP is removed.
9. Maintenance activities other than O&M work:
 - Name and signature of the person performing the activity
 - State license number of each person performing the activity
 - Activity start and completion dates
 - Precise locations
 - Description of the activity and any preventive measures
 - If LBP is removed, name and location of the storage or disposal site
10. Periodic Surveillance:
 - Name of each person performing the surveillance
 - Date of the surveillance
 - Any changes in the condition of the material
11. All information regarding the LBP permit system should be kept as a part of the recordkeeping system

7.0 WORKER PROTECTION

The following subsections discuss necessary aspects of LBP maintenance projects in addition to specific procedures to follow for work involving LBP at properties.

A. MEDICAL SURVEILLANCE PROGRAM

It is important to establish an ongoing medical surveillance program for several reasons. The three major areas of concern are:

1. The safety and health of all workers.
2. Regulatory requirements.
3. Other legal liability concerns.

Through implementation of a sound medical surveillance program, it will be possible to verify every worker's medical status at a particular time, comply with OSHA standards on medical surveillance of workers exposed to LBP, and also, to reduce other possible liability risks. In this section, these three concerns are addressed, in addition to several other considerations associated with medical surveillance programs.

WHO NEEDS MEDICAL SURVEILLANCE?

Employees who should be provided medical surveillance are custodial, maintenance, and technical workers who may encounter LBP while performing their normal duties. Examples of these duties might be repairing; LBP covered doors, frames, windows, cabinets, trim, etc. or preparing a vacant unit for being reoccupied (e.g., painting or washing).

OSHA STANDARDS - MEDICAL SURVEILLANCE

According to the OSHA LBP standards, (29 CFR 1910.1025) for general industry and (29 CFR 1926.62) for construction and abatement workers, THE CROSS AT BERKELEY must provide medical examinations relative to their worker's exposure to LBP (at or above the action level and/or exclusion limit). An acceptable medical surveillance program must include pre-placement and standard examination provided there is sufficient evidence that demonstrates that a worker has not been examined in accordance with the standard within the past one-year period. This standard also outlines the requirements for maintaining medical records on each worker.

PRE-PLACEMENT EXAMS

According to the OSHA standards, the required pre-placement examination must take place before the worker starts the LBP job. A comprehensive medical evaluation must be performed. This should include, as a minimum, a medical to determine the presence of any possible respiratory diseases and pulmonary function tests including forced vital capacity (FVC) (the maximum amount of air that can be expired from the lung after full inhalation), and forced

expiratory volume at one second (FEV 1.0) (the amount of air forcibly expired in one second after full inhalation). A chest X-ray (posterior-anterior 14 x 17 inches) is optional at the discretion of the physician; however, it is strongly recommended for the initial examination in order to establish baseline medical data for the worker.

The results of this examination will be used as the worker's baseline health status. Also, the physical exam will be used to determine whether a worker is capable of safely working while wearing a respirator. A physician's report will then be furnished to Apartment Name for their files. The physician must provide to the worker a statement that the worker has been informed by the physician of the results of the medical examination. Also, the physician is not to reveal in the written opinion given to Apartment Name specific findings or diagnoses unrelated to occupational exposure to LBP. Apartment Name must provide a copy of the physician's written opinion to the affected worker within 30 days from its receipt. They also must maintain the results of the examination on file for the duration of employment plus 30 years. In the event a worker files suit at some future date claiming a disability, Apartment Name will be able to check their records for documentation when investigating whether or not the condition could have occurred as a result of employment with their company.

In addition to the medical reports, Apartment Name must request that the physician provide a statement indicating whether or not a worker is capable of wearing a respirator. This statement should make references to any lung restrictions that would prevent respirator usage as well as any other limitations associated with their use.

ANNUAL EXAMINATIONS

According to OSHA 29CFR 2910.1025 and 29 CFR 1926.62 Apartment Name must provide, or make available comprehensive medical evaluations to each of their workers engaged in occupations which cause exposure to LBP dust or particulate (i.e., abatement workers, maintenance people, etc). Such annual examinations must include, as a minimum, a study to determine the presence of any respiratory diseases, a pulmonary function test which includes FVC and FEC 1.0, and a chest X-ray (posterior - anterior 14 x 17 inches) upon some circumstances as outlined in the OSHA standards.

The physician will be able to compare the annual examinations with the replacement evaluations to determine if there are any changes in a worker's health status. If there are noticeable changes, the LBP Project Manager and the worker should both be notified since the situation may require immediate action i.e., transfer to another job, discontinue respirator use, etc.).

BIOLOGICAL MONITORING

According to OSHA, biological monitoring in the form of blood sampling and Zinc protoporphyrin levels at least every 2 months for the first 6 months and every 6 months thereafter must be taken. Should any workers blood level be at or above 40 ug/dl, and at least every 2 months until two consecutive blood samples and analysis indicate a blood level below 40 ug/dl and at least monthly for any worker who has been removed from exposure to lead due to an elevated blood lead level.

Whenever the results of a blood lead level test indicate that a worker's blood lead level exceeds 50 ug/dl, a second follow-up blood sampling test shall be taken within two weeks after the first blood sampling analysis results were made available.

REASONS FOR SPECIFIC TESTS

All of the tests that are required to be performed during pre-placement, annual, and termination medical examinations are required in order to properly evaluate the human body systems that are most likely to be affected by exposure to elevated levels of LBP dust or particulate. Some specific reasons for each test are discussed as follows:

Pulmonary History: This part of the examination is simply a questionnaire (Appendices of both OSHA LBP Standards) that is completed by the worker and physician. It is used to identify the potential for respiratory diseases. Several questions relate to chronic lung diseases, while others address the worker's personal habits such as smoking.

Physical Examination: Criteria to be evaluated on the routine physical examination often include medical history, blood pressure, pulse, vision (depth perception, peripheral), an audiogram (hearing test), urinalysis, and follow-up classification with appropriate recommendations.

Pulmonary Function: These tests are conducted to determine if a person's lungs are expanding normally, and if there is adequate air movement in and out of the lungs. The FVC and FEV 1 are conducted through the use of a spirometer. If the FEV 1 is reduced, this may signify a possible obstruction or problem in a worker's lungs. If the FVC or the ratio of FEV 1 to FVC is reduced, this may signify restrictive changes in the worker's lungs.

It is a good recommended practice to require individuals over 40 years of age, or other people who might be at an increased risk, to have a physical examination. Also, for these same individuals, it would be valuable to have electrocardiograms performed. It is a known fact that the use of respirators places increased strain on the cardiopulmonary; thus, if abnormalities show up on the electrocardiogram, appropriate actions can be taken (i.e., transfer to a job that does not require respirator use).

It is recommended that workers receive the above tests at a health care facility with experience in occupational medicine.

B. RESPIRATOR PROGRAM

When LBP is disturbed, as in the case of LBP removal projects, LBP dust or particulate may be released. Once in the air, the LBP particulate may be inhaled by workers performing these projects. Engineering controls and work practices such as wet methods are used to minimize the generation of airborne particulate. Since no method has been devised to remove LBP without generating some dust or airborne particulate, respirators must be used at all times.

There are three ways that hazardous materials can enter the body:

1. through the gastrointestinal tract, usually via the mouth
2. through the skin

3. through the respiratory system.

RESPIRATORY SYSTEM

The respiratory system is a gaseous (air) pump containing a series of airways leading from the nose and mouth down into the air sacs (alveoli) where there is an exchange of oxygen and carbon dioxide. The main components of the respiratory system, from top to bottom are as follows:

- Nose and mouth
- Throat
- Larynx (voice box)
- Trachea (windpipe)
- Bronchi (branches from trachea)
- Alveoli (air sacs in the lung)
- Diaphragm and chest muscles

The human body has certain natural defenses to protect itself against inhaling dust, the most important being the mucociliary escalator. Airways of the upper respiratory tract (trachea through bronchi) are lined with cilia (hair-like protrusions) covered with a layer of mucous. These cilia are constantly sweeping upward quickly, then down slowly, and thus moving the mucous and trapped materials up at a rate of approximately one-inch per minute. This is an important clearance mechanism which prevents most large particles from reaching the alveoli in the lungs. Particles trapped in the mucous are carried back up to the throat where they are swallowed or expectorated. Unfortunately, this natural defense mechanism does not prevent all LBP particulate from entering the body. Accordingly, respirators must be worn to provide further protection when LBP exposure is likely.

RESPIRATORY HAZARDS

Respiratory hazards are generally divided into two categories, toxic contaminants and oxygen deficiency. Generally, LBP abatement projects do not pose oxygen deficiency hazards. However, since there may be rare projects and circumstances where it can be a problem, oxygen deficiency must always be considered. For example, there could be an oxygen deficiency problem while performing abatement in steam tunnels, mechanical chases or boilers. Failing to consider oxygen deficiency could result in a fatality on any project.

Toxic contaminants are a more common category of respiratory hazards encountered on abatement projects. These toxic contaminants are generally divided into three categories: particulates, gaseous materials, or vapors (or a combination of two or all of the above). Lead-based paint is an example of the particulate category, carbon monoxide is an example of the gaseous category, and an epoxy encapsulant is an example of a harmful (organic) vapor. It is possible to have all of these hazardous substances, as well as others in a work area at the same time.

The control of respiratory hazards often involves three steps:

1. Assessing the hazards

2. Reducing or eliminating the hazards
3. Providing respiratory protective equipment

The LBP detection and control industry is actually based on these first two steps. Buildings and other structures are inspected or surveyed to assess potential LBP hazards.

When a potential LBP hazard exists, a contractor is called upon to reduce or eliminate the hazard through removal, encapsulation, or enclosure of the material. Thus, the third step, respirators, can be avoided to protect the building occupants, custodial, and maintenance personnel.

THE SELECTION OF APPROPRIATE RESPIRATORY EQUIPMENT

Respirators are commonly used to help protect against inhalation hazards. However, a respiratory protection program is not simply donning a respirator and expecting to be adequately protected.

The selection of appropriate respiratory equipment generally involves three steps:

1. Identifying the hazards;
2. Evaluating the hazards;
3. Providing proper respiratory protective equipment to suit the conditions and the individual.

The respirator selected and the respiratory program established must conform to OSHA standards and guidelines published by respiratory manufacturers. The OSHA respirator standard (29 CFR 1910.134) requires that only approved respirators are used. They must be approved for protection specifically against LBP particulate.

The National Institute for Occupational Safety and Health (NIOSH) is the official testing and approval agency for respirators. If the respirator assembly including cartridges, filters, and hoses, pass the NIOSH test, then they issue a NIOSH approval number. The specific number is preceded by the letters "TC", which indicates the respirator assembly was "Tested and Certified".

CATEGORIES OF RESPIRATORS

There are two broad categories of respirators. These are air-purifying and supplied-air respirators. In each category there are many different types of respirators (i.e., powered air-purifying, gas masks, pressure demand supplied-air respirators, etc.). Many of the respirators available for use, however, are not appropriate for protection against LBP. For the most part, these will not be discussed.

Air-Purifying Respirators

These respirators remove the hazardous contaminant from the breathing air before it is inhaled. They consist of a soft, rubber or synthetic face piece and replaceable filters or cartridges. Two major subcategories of air-purifying respirators are the mechanical filter type and the chemical cartridge type. The mechanical filter variety is designed to protect against particulate contaminants such as LBP. The chemical cartridge type protects against gaseous

contaminants such as solvent vapors. Each respirator assembly is approved for a particular contaminant. Care must be taken in choosing the appropriate unit. High efficiency particulate air (HEPA) filters designed for LBP are typically purple or magenta in color. These filters will remove 99.97 percent of particles 0.3 micrometers or greater in diameter.

Air-purifying respirators are further categorized based on their degree of face coverage. The half-mask respirator covers half the face - from the bridge of the nose to under the chin. A full-face respirator covers the face from the forehead to under the chin. The most extensive coverage provides a better fit and a higher degree of protection. Air-purifying respirators depend upon breathing action to draw atmospheric air through the respirator filter or cartridge where it is decontaminated. Hence, they are referred to as "negative pressure" respirators.

[Please see below for examples.](#)

A special subcategory of an air-purifying respirator is the Powered Air Purifying Respirator (PAPR) type. It uses the same types of cartridges and filters as regular air purifying respirators to clean the air. PAPR's, however, are positive-pressure devices which employ a portable, rechargeable battery pack and blower to force contaminated air through a filter or cartridge, where it is cleaned and supplied to the wearer's breathing zone. PAPR's are available in both tight-fitting and loose-fitting styles. Because the air is being drawn from the immediate work area, they too offer no protection against oxygen deficiency. An advantage of using a powered air-purifying respirator is that it supplies air at a positive pressure within the face piece, helmet, or hood so that any leak is usually outward.

Air purifying respirators remove limited concentrations of air contaminants from the breathing air, but do nothing to improve (or change) the oxygen content and where air contaminants do not exceed the specified range of the respirator and cartridge. Often, however, this is adequate protection when prepping the LBP abatement work area, performing final clean-up (wipe-downs), or during glove bag removal projects.

PROTECTION FACTORS

Respirators offer varying degrees of protection against LBP particulate. The key to understanding the difference between types of respirators (air-purifying, powered air-purifying, air-supplied) is the amount of protection afforded the wearer. To compare these, one must understand the concept of a protection factor (PF).

A protection factor is defined as the concentration of a contaminant measured outside the mask divided by the concentration you would expect to find inside the mask. This simple formula is illustrated below:

$$\text{Protection Factor (PF)} = \text{Concentration Outside Mask} \div \text{Concentration Inside Mask}$$

The protection factor depends greatly on the fit of the mask to the wearer's face. Accordingly, the protection offered by any one respirator will be different for each individual person. Further, the protection constantly changes depending upon the worker's activities and even shaving habits. When a worker laughs or coughs inside a respirator, the protection factor will decrease since the mask will not "fit" as well during laughing or coughing. Similarly, the worker who forgot to shave one morning will not receive as much protection that day since the mask will not fit as well to the face. The importance of properly fitting the mask should now be obvious.

It is virtually impossible to measure the concentration inside the mask (where the worker is breathing) for each worker, all the time, during the various activities he or she may be conducting. Accordingly, protection factors, based on extensive research, have been developed for different categories of respirators. Using these protection factors, it is easy to determine what type of respirator is appropriate to maintain the concentration of lead particulate inside the mask below a certain level.

RESPIRATORY PROTECTION PROGRAM

Any employer who requires or permits workers to wear a respirator must have a written protection program. This is required by OSHA in both of their lead standards and their respiratory protection standard (29 CFR 1910.134). The written respirator program establishes standard operating procedures concerning the use and maintenance of respiratory equipment. In addition to having such a written program, Wedgwood Apartments must also be able to demonstrate that the program is enforced and updated as necessary.

The OSHA regulations spell out just what must be included in a written program. Below, these items are discussed with special emphasis on applications to work performed by LBP abatement personnel.

An effective respirator program should include:

1. A written statement of company policy, including assignment of individual responsibility, accountability, and authority for required activities of the respiratory program.
2. Written standard operating procedures governing the selection and use of respirators.
3. Respirator selection (from NIOSH approved and certified models) on the basis of hazards to which the worker is exposed.
4. Medical examinations of workers to determine whether or not they may be assigned an activity where negative pressure respiratory protection is required.
5. Worker training in the proper use and limitations of respirators (as well as a way to evaluate the skill and knowledge obtained by the worker through training).
6. Respirator fit testing.
7. Regular cleaning and disinfecting of respirators.
8. Routine inspection of respirators during cleaning, and at least once a month and after each use for those respirators designed for emergency use.
9. Storage of respirators in convenient, clean, and sanitary locations.
10. Surveillance of work area conditions and degree of worker exposure (e.g., through air monitoring).
11. Regular inspection and evaluation of the continued effectiveness of the program.

All of the above items are required by OSHA if workers wear respirators during work.

ESTABLISHING A POLICY

Apartment Name should prepare a clear, concise policy regarding the use of respirators by their workers when performing LBP abatement activities. This policy should serve as the guiding principal for the preparation, implementation, and enforcement of an effective respiratory protection program.

DESIGNATION OF A PROGRAM ADMINISTRATOR

A respiratory protection program administrator must be designated by name. This person is responsible for implementation of, and adherence to, the provisions of the respiratory protection program. It is usually a good idea to also designate a person who is responsible for enforcement of the procedures at each job site. Procedures should also be outlined for enforcement of the program. Enforcement procedures and the development of the program as a whole should be done in conjunction with, and input from, the workers and/or their representatives.

SELECTION AND USE OF RESPIRATORY PROTECTION EQUIPMENT

Respirators used shall be selected from those approved by the National Institute for Occupational Safety and Health (NIOSH) for use in atmospheres containing LBP dust or particulate. A NIOSH-approved respirator contains the following: an assigned identification number associated with each unit; a label identifying the type of hazard the respirator is designed to protect against; additional information on the label which indicates limitations and identifies the component parts approved for use with the basic unit.

MEDICAL APPROVAL

Only those individuals who are medically capable to wear respiratory protective equipment shall be issued a respirator. Initially, before being issued one, a worker will receive pertinent tests to evaluate medical and physical condition, and annually thereafter. Medical tests to be conducted by a physician often include: pulmonary function test, electrocardiogram, and any other tests needed for proper evaluation by a physician. A medical history in the form of a questionnaire is collected as well for each individual. Other factors to be considered by a physician may include: emphysema, asthma, chronic bronchitis, heart disease, anemia, hemophilia, poor eyesight, poor hearing, hernia, lack of finger or hand usage, epileptic seizures, and other factors which might inhibit the ability of a worker to wear respiratory equipment.

EMPLOYER TRAINING PROGRAM

Each worker designated to wear a respirator must receive adequate training. The training session (initial and periodic training) should be conducted by a qualified consulting firm, training center, or the LBP Program Manager to ensure that workers understand the limitations, use, and maintenance of respiratory equipment.

RESPIRATOR FITTING

One of the most important elements of an effective respirator program is fit. The OSHA LBP standards (29 CFR 1910.1025 and 1926.62) and the OSHA respirator standard (29 CFR 1910.134) require that the fit of respirators be determined when the respirator is issued and every year thereafter for all negative pressure respirators. Procedures for fit-testing should be addressed in the written respirator program.

CLEANING AND DISINFECTION OF RESPIRATORS

Whenever possible, a respirator should be reserved for the exclusive use of a single individual. Following each use, the respirator should be cleaned and disinfected. The following procedures can be used to clean a respirator:

- Wash with a detergent or a detergent/disinfectant combination, in warm water using a brush.
- Rinse in clean water, or rinse once with a disinfectant and once with clean water. The clean water rinse is particularly important because traces of detergent or disinfectant left on the mask can cause skin irritation and/or damage respirator components.
- Air dry on the rack or hand; position the respirator so that the face piece rubber will not dry misshaped.

ROUTINE INSPECTION OF RESPIRATORS

Inspection of the respirator is an important, routine task. It should be done before and after each use. The following items should be checked, at a minimum:

I. Air-Purifying Respirators (half-mask and full face piece)

1. Rubber face piece should be checked for:
 - Excessive dirt
 - Cracks, tears, or holes
 - Distortion from improper storage
 - Cracked, scratched or loose fitting lens
 - Broken or missing mounting clips
2. Head straps should be checked for:
 - Breaks or tears
 - Loss of elasticity
 - Broken or malfunctioning buckles or attachments
 - Excessively worn serrations of the head harness which might allow the face piece to slip
3. Inhalation valve, exhalation valve, should be checked for:
 - Detergent residue, dust particles or dirt on valve seat
 - Cracks, tears or distortion in the valve material or valve seat
 - Missing or defective valve cover
4. Filter elements should be checked for:
 - Proper filter for the hazard
 - Approval designation (TC ... ID# ...)
 - Missing or worn gaskets
 - Worn threads
 - Cracks or dents in filter housing
5. Powered Air Purifying Respirators
 - Check face piece, head straps, valve and breathing tube, as for regular air purifying respirators.
 - Hood or helmet, if applicable -- check for:

- Headgear suspension (adjust properly for wearer)
- Cracks and breaks in face shield (replace face shield)

6. Supplied Air Respirators

Face piece, head strap, and valves should be checked as specified above. In addition, the following checks should be performed:

1. Breathing tube should be checked for:
 - Cracks
 - Missing or loose hose clamps
 - Broken or missing connectors
2. Hood, helmet or suit should be checked for:
 - Headgear suspension
 - Cracks or breaks in face shield
 - Rips and torn seams
3. Air supply systems should be checked for:
 - Breaks or kinks in air supply hoses and end fitting attachments
 - Tightness of connections
 - Proper setting of regulators and valves (consult manufacturer's recommendations)
 - Correct operation of air purifying elements and carbon monoxide or high-temperature alarms
4. Self-contained Breathing Apparatus (SCBA)
 - Consult manufacturer's literature

REPAIR

At some point any respirator will need replacement parts or some other repair. The law requires that the person who repairs respirators be trained and qualified. It is important to realize that respirator parts from different manufacturers are not interchangeable. NIOSH approval is invalidated if parts are substituted.

RESPIRATOR STORAGE

Proper storage is very important. The law requires that respirators be protected from dust, sunlight, hat, extreme cold, excessive moisture, and damaging or contaminating chemicals. When not in use, the respirator should be placed in a closed plastic bag and stored in a clean, convenient, sanitary location.

SURVEILLANCE OF WORKING CONDITIONS

Apartment Name must provide adequate surveillance of the worker's working conditions to be certain the respirator selected provides adequate protection. In the case of LBP abatement, this includes a determination if other hazardous airborne contaminants might be encountered for which the respirator chosen is not adequate.

Air monitoring to estimate the LBP exposure provides the needed information to determine if the respirator chosen affords sufficient protection to the individual.

RESPIRATOR PROGRAM EVALUATION AND RECORDKEEPING

The respirator program shall be evaluated at least annually with program adjustments, as appropriate, made to reflect air sampling or other evaluation results. Compliance to the aforementioned points of the program should be reviewed; respirator selection, purchase of approved equipment, medical screening of workers, fit testing issuance of equipment and associated maintenance, storage, repair and inspection, appropriate surveillance of work area conditions.

Attention should be given to proper recordkeeping. Records which should be kept include: names of worker trained in respirator use, documentation of the care and maintenance of respirators, medical reports of each respirator user, possible airborne concentrations of LBP particulate during work, and any problems encountered during projects with regards to respiratory equipment.

FITTING RESPIRATORY PROTECTIVE EQUIPMENT

Only tight-fitting respirators that have been selected for contaminants and conditions, to which you are potentially exposed, must be tested. A respirator will not protect you unless the air you breathe passes through the filter or canister, or unless all of the air comes from the supply system. If the face seal is not tight or the connections are loose, you may think you are breathing through the purifying system, but may actually be breathing around it.

You may have to try several different respirators before you find one that fits properly. For any tight-fitting respirator, beards and bushy sideburns may have to be shorn. Respirator face pieces will not seal over them. Similarly, gum and tobacco chewing cannot be permitted since excess facial movement can break the face seal. If you wear prescription glasses, you must wear a respiratory face piece that will accommodate the glasses. Contact lenses should not be worn while wearing a respirator. A properly fitted respirator will stretch the skin at the temples slightly so that the contact lens might easily pop out.

The OSHA LBP standards (29CFR 1910.1025 and 1926.62) and the OSHA respirator standard (29 CFR 1910.134) require that the fit of respirators be determined when they are issued and that the fit be checked each time the respirator is worn.

There are two major categories of fit-testing, *qualitative* (pass/fail) and *quantitative* (measures levels within the mask). Only those tests applicable to LBP work are discussed on the next page.

RESPIRATOR FIT CHECKS

Once the respirator has been selected and no visual leaks are evident a *negative pressure check* and *positive pressure check* are performed by the wearer. These simple procedures are described below:

1. Negative Pressure Check

For this fit-check the wearer closes off the inlet of the filters or cartridges by covering them with the palms of the hands or by squeezing the breathing tube so that air cannot pass through, inhales so that the face piece collapses slightly, and holds his/her breathe for about 10 seconds. If the face piece remains slightly collapsed and no inward leakage of air is detected, the respirator passes the check. This check can only be used on respirators with tight-fitting face piece. Its potential drawback is that hand pressure can modify the face piece seal and cause false results.

2. Positive Pressure Check

This fit-check is similar in principle to the negative pressure fit-check. It is conducted by closing off the exhalation valve of the respirator and gently exhaling into the face piece. The respirator is considered passing if positive pressure can be built up inside the face piece without evidence of outward air leakage around the face piece.

If the respirator selected fails to pass these simple fit-checks, the fit-testing should not proceed further. Instead, another size or another brand should be donned and these checks repeated. Alternatively, it may only be necessary to adjust the straps on the respirator and repeat the checks. Once the wearer has successfully passed the negative and positive pressure fit-checks, the actual fit-test may be conducted. The OSHA standards permit qualitative fit-testing for half-mask air-purifying respirators.

QUALITATIVE FIT-TESTING

During fit-testing, the respirator straps must be properly adjusted, in accordance with the manufacturer's direction, and should be as comfortable as possible. Over tightening the straps will sometimes reduce face piece leakage, but the wearer may be unable to tolerate the respirator for any length of time. The face piece should not press into the face and shut off blood circulation or cause major discomfort. At the time of respirator selection, a visual inspection of the fit should always be made by a second person.

The actual qualitative fit-test method chosen is at the discretion of the employer as it is one of the three specified in Appendix C of the OSHA LBP standards (29 CFR 1910.1025 or 29 CFR 1926.62). The procedures used must follow those in the appendix whether irritant smoke, isoamyl acetate, or saccharin is chosen as the test agent. The irritant smoke test is summarized below as it is the only test that produces an involuntary response if the proper fit is not achieved.

IRRITANT SMOKE TEST

If the previous checks have been successful, the irritant smoke test may be administered. It can be used for both air-purifying and supplied-air respirators. However, an air-purifying respirator must have high efficiency filters. The test substance is an irritant smoke (stannic chloride or titanium smoke are available from safety supply companies. When the tube ends are broken and air passes through them with a squeeze bulb, a dense irritating smoke is emitted.

For the test, the respirator wearer performs a number of exercises that would simulate activities normally encountered in a work situation (such as, talking, head moving, jogging in place, etc.). The irritant smoke is sprayed or squeezed near the respirator wearer's head around the edges of the respirator. If the wearer detects the irritant smoke inside the respirator, it indicates a defective fit; the respirator fails this test. The likelihood of pretending to pass this test is low.

NOTE: This test must be performed with caution because the irritant smoke is highly irritating to the eyes, skin, and mucous membranes. When testing a half-face mask respirator, the eyes must be kept tightly closed.

QUANTITATIVE FIT-TESTING

Quantitative fit-testing requires a test substance which can be generated into the air, specialized equipment to measure the airborne concentration of the substance, and a trained tester. A sodium chloride solution, corn oil or mineral oil is usually used to perform this test. The person to be tested puts on the respirator and enters a chamber which contains the test substance in the air. The airborne concentration of the substance is measured outside the respirator and inside the respirator while the worker mimics several typical work related activities. The specific degree of protection -- protection factor -- can be determined for the wearer with the specific respirator worn.

Quantitative fit-testing is usually performed in a laboratory; however, portable fit-testing units are available and some companies offer on-site testing.

C. PROTECTIVE CLOTHING

It is important to understand why protective clothing is worn during LBP abatement work: the primary reason is to keep gross amounts of LBP-containing debris off the body, hair, etc. The use of protective clothing and showers will minimize the chance of bringing lead dust out of the work area and into the home.

Protective clothing for LBP abatement projects usually consists of disposable coveralls, rubber gloves, foot covering and head covering. The foot and head covering should be attached to the coveralls. This eliminates the need to tape opening between garments, etc. Gloves should be worn at all times when disturbing LBP.

The disposable coveralls, gloves, foot, and head coverings are available from many sources and in several materials. Coveralls, with foot and head covering attached usually cost about \$3 each when purchased in quantity. It is important to realize that many "bargain" prices may not be a bargain at all. The less expensive coveralls often use less material. Be sure to check the construction of the coveralls as well. Double stitching on seams will last longer, but cost more.

DONNING PROTECTIVE CLOTHING

Protective clothing is donned before entering the work area. The following sequence should be used:

1. Put disposable coveralls over work clothes.
2. If separate disposable foot coverings are used, these are donned.

3. Ankles are taped to take up slack in the suits and reduce the chance of tripping. (Tape pants over foot coverings, if separate.)
4. The respiratory equipment is inspected, donned, and fit checked.
5. The hood or head covering is pulled up over the respirator head straps.
6. Put on deck shoes (or safety shoes/boots, as required).
7. Gloves are donned. The sleeves are taped over the gloves using duct tape.
8. Other protective equipment such as hard hat and safety glasses (if a half-face respirator is used) are donned.

Once inside the work area, no worker, or others, should be permitted to leave without going through the decontamination sequence unless it is an extreme emergency. A common problem is workers "stepping out" for a cigarette or supervisors "stepping in" the work area to deliver a message or a piece of equipment. These activities defeat the purpose of the protective equipment and the decontamination sequence.

TAKING PROTECTIVE CLOTHING OFF

Whenever a worker or other person leaves a work area for any reason, they must go through the decontamination sequence. This sequence should include the following steps.

1. HEPA-vacuum reusable equipment such as boots/shoes, safety glasses, hard hats, etc. and leave inside the work area.
2. HEPA-vacuum outer layer of protective clothing; remove and place in disposal bag.
3. Exit work area.

Disinfect, clean, and inspect respirator.

8.0 TRAINING

Training of service (custodial and maintenance) workers is one of the most important aspects of an effective O&M Program. Training serves to establish proper awareness and understanding of work practices that are vital to the success of the program.

CLEANING AND CUSTODIAL WORK

All service personnel who work at a property that contains LBP should receive a minimum of two (2) hours of awareness training. This training session will include, at a minimum all the information outlined in the section on Notification.

MAINTENANCE WORK

Service personnel who conduct any activities that will result in the disturbance of LBP should receive eight hours of safe work practices training plus additional instruction pertaining to specific situations at their facility. Information to be presented in this training session includes proper cleaning techniques, appropriate practices for handling LBP, proper use of respirators and other protective equipment, including hands-on training.

This training program instructs participants in proper cleaning techniques that involve the use of wet methods, HEPA vacuuming (utilizing a vacuum cleaner with a High Efficiency Particulate air filter, trapping at least 99.97% of all particles 0.3 microns in diameter or larger), protective equipment, and proper waste disposal methods.

Maintenance workers will need to be trained in local isolation of the HVAC system, isolation of the work area from non-work areas (through the use of barriers and warning signs, etc.), HEPA vacuuming, the use of methods to reduce dust and particulate release, clean-up and decontamination procedures, and LBP disposal procedures. In addition, maintenance workers in this category will need to be involved in a respiratory protection and medical surveillance programs.

With respect to outside contractors (e.g., electrical, plumbing, and construction contractors), the LBP Program Manager should require evidence that the contractor is familiar with the O&M Program, has experience and/or training in working around LBP, and has adequately trained work crews.

9.0 STATE SPECIFIC REQUIREMENTS

Each state - and possibly municipality - will have lead-based paint rules and regulations peculiar to that state or municipality, and must be requested from the appropriate agency for inclusion into this section of the manual. Contact and notification data, forms, and written guidance should be a part of this material.

SAMPLE

10.0 FACILITY SPECIFIC LBP INFORMATION

The following pages, if any, contain community specific information on the location and condition of LBP as available from any onsite lead-based paint testing that has been conducted. If there is no site specific information, all painted surfaces that pre-date 1978 should be assumed to be LBP until analytical testing proves otherwise.

SAMPLE