Chapter 18: Lead Hazard Control and Historic Preservation

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Lead Hazard Control in Historic Buildings: How To Do It

1. If Federal funds are involved in a lead-based paint abatement project, the recipient must determine if the dwelling is listed on the National Register of Historic Places or is eligible for listing and consult with State Historic Preservation Office (SHPO) and local historic preservation officials. Compliance with 36 CFR Part 800 that outlines the Section 106 review process of the Advisory Council on Historic Preservation (ACHP) may be required. Refer to HUD's *Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing* for technical information on lead-based paint hazard control measures. For agencies or organizations expecting to undertake lead hazard control activities in a large number of homes, a programmatic agreement with the SHPO and the ACHP should be developed. The agreement should define different levels of treatment for houses depending on their level of historic significance.

2. Identify the historic preservation issues that may be faced when conducting lead-based paint hazard control work with the intent of retaining historic building materials and their historic appearance to the greatest extent possible. With the assistance of trained historic preservation architects, architectural historians, or the SHPO, determine which architectural elements of the building can be preserved.

3. Establish priorities for intervention. Determine if the scope of the project will involve full abatement of all paint, abatement of lead-based paint hazards, or interim controls. Part of the scope of work may be determined by the type of housing assistance (e.g., HUD-funded public housing may require full abatement of all lead-based paint; HOME or CDBG-funded projects may require lead-based paint *hazard* control, as defined in the Glossary).

4. Have a combination risk assessment and paint inspection performed by a certified risk assessor. Keep a record to guide future rehabilitation and maintenance work. If properties are of noted historical significance, label and store samples of historic paint for future preservation work.

5. Assess the danger of lead exposure for each significant architectural item to determine how extensive an intervention is necessary, its cost, and its feasibility in order to make the overall project lead safe. The most serious lead hazards may require full abatement or replacement, while the less serious lead hazards may only require repair and paint film stabilization.

6. Negotiate the hazard control strategy with the SHPO and give special consideration to those methods that do not destroy significant architectural features and finishes. Refer to the Secretary of the Interior's "Standards for the Treatment of Historic Properties" (1992). Avoid removal of significant historic materials, avoid the use of harsh abrasive cleaners or chemicals that are too strong on historic materials, and avoid covering over historic siding, whenever possible and financially feasible.

7. If paint is to be removed, the preferred treatments include wet sanding of deteriorated peeling paint; finish sanding with special mechanical sanders with a high-efficiency particulate air (HEPA) vacuum local exhaust ventilation, low-heat paint stripping; chemical strippers (except methylene chloride); and offsite stripping with heat or chemicals. Do not use open flame or high heat removal of lead, or dry sanding or abrasive removal. Comply with worker safety requirements.

8. If the preservation option is economically prohibitive, or if significant features are removed, or if abatement activity will otherwise adversely affect historic properties, the programmatic agreement, if one has been negotiated, should prescribe the procedures to be followed or the methods to be used. In the absence of a programmatic agreement, a Memorandum of Agreement should be negotiated for treatment of the property.

9. Submit the Memorandum of Agreement to the Advisory Council on Historic Preservation.

10. Upon completion of the project, provide educational materials to the residents describing the health hazards of lead-based paint and provide information on appropriate housekeeping methods to keep the property in a lead-safe condition once lead hazard control work is completed. Disclosure of testing and hazard control results may be required.

Chapter 18: Lead Hazard Control and Historic Preservation

I. Introduction

Some of the recommended treatments for lead-based paint hazard control can cause irreversible damage to historic properties. Such actions, when federally assisted, are subject to special review procedures to protect historic properties. Section 106 of the National Historic Preservation Act of 1966, as amended, requires Federal agencies to take into account the effects of their undertakings on historic properties and to afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings. This statutory requirement is implemented by the ACHP regulation 36 CFR Part 800. Every State and unit of general local government receiving HUD Community Development Block Grants (CDBG) or HOME program assistance should be familiar with the ACHP regulations, since they must comply with Section 106 as part of the environmental review for program activities. If the agency responsible for lead-based paint abatement or hazard control (and the environmental review) is not familiar with the Section 106 process, they should contact their State Historic Preservation Officer (SHPO) or the State or local agency administering the CDBG or HOME programs for assistance.

Implementing the guidance in this chapter does not substitute for compliance with the ACHP regulations. Many States and local government agencies have entered into CDBG programmatic agreements with the ACHP and the SHPO to facilitate compliance with the historic preservation regulations for rehabilitating historic properties. Expanding the provisions of the programmatic agreements to accommodate lead-based paint abatement activities is recommended. If an agency or organization is planning to undertake lead hazard control in a large number of homes, a programmatic agreement could significantly reduce the time needed to consult with the SHPO for lead interventions.

II. Standards for the Treatment of Historic Properties

The Secretary of the Interior is responsible for establishing standards for the preservation and protection of all cultural resources listed on or eligible for the National Register of Historic Places. The Secretary of the Interior's "Standards for the Treatment of Historic Properties" were initially developed in 1975 and were most recently revised in 1992. These Standards guide owners (including Federal agencies) of historic buildings who are undertaking rehabilitation, restoration, preservation, and reconstruction of historic properties. In addition, the Standards are used by the ACHP and the SHPO to evaluate the impact of physical treatments on historic resources.

When dealing with historic properties, significant spaces, finishes, and features must be identified and priorities for preservation must be set. This applies to both exteriors and period interiors that might include decorative frescoes, polychromed woodwork, or historic painted finishes encased under modern paints.

For homes determined to be on the National Register or eligible for listing, which are historically significant buildings or to exhibit a high degree of craftsmanship, there may be conflicts between certain proposed abatement treatments and the Standards for the Treatment of Historic Properties. These conflicts include:

- Removal of historically significant architectural features and finishes that have been previously painted with lead-based paint may result in loss of significant historic materials.

- Abrasive or chemical paint removal methods may disfigure or destroy evidence of significant craftsmanship.
- Complete removal of paint from substrates can result in the total loss of paint chronology or important evidence of previous decorative paint finishes and colors for properties of great historic significance.
- Replacement or enclosure of historic wooden siding with modern vinyl or aluminum siding may damage historic materials and diminish the architectural integrity of the historic resource.

III. Historic Preservation Issues and Lead-Based Paint

Since lead-based paint was commonly used until the 1950s and was not banned from residential use until 1978, it is almost always present in historic buildings. Lead-based paints are generally found on wooden trim and all surfaces that normally received gloss enamel or oil paints (e.g., metal grills and radiators often were painted with lead-rich enamels). Early calcimine and milk paints that were primarily waterborne were often thought to be lead-free, but many of the color pigments contained lead. Significant decorative techniques, such as faux graining, marbling, stencilling, frescoes, murals, and painted friezes frequently involved the use of lead-based paints.

In homes of great historic significance, it may be important to document evidence of initial construction and subsequent alterations that can be found in paint layering on historic substrates. Unless paint analysis is performed prior to paint removal, this evidence will be lost. By comparing paint layers from one portion of the housing unit or room to another, a list of dates and known changes can be recorded. The relocation of significant elements, such as mantels, from one room to another can often be detected by comparing paint layers. The original colors of these elements can also be determined by evaluating samples of paint under a microscope with correcting light filters.

IV. Property Evaluation

A. Evaluating the Significance of a Property

It is the responsibility of a Federal agency or its recipient to identify the architectural significance of a dwelling prior to undertaking work that might affect the historic resource. The responsible entity may need to enlist an architectural specialist to assist in this effort. (Qualified historical architects and preservation specialists can be found through the State Historic Preservation Office.) The National (or State) Register of Historic Places Nomination Form is often a tool to use to identify significant features.

The quality of a building's architecture and craftsmanship must be considered when evaluating the significance of a property. Buildings that exhibit distinctive characteristics of an architectural design, represent work by skilled craftsmen, or have high artistic value may require a greater sensitivity on the part of a responsible entity when undertaking alterations or modifications to that structure. Worker housing in an industrial mill town was often constructed with heavy timber post and beam construction or balloon frame wooden systems, but may have very simple decorative or trim work on the interior. The significance of these properties is more closely tied to social movements within our cultural history than to architectural design. A property designed by a prominent architect using master craftsmen and artistic painters will be noted for its architectural appearance and design.

To define the elements within a dwelling that are of the highest priority for preservation, the responsible entity should identify physical features that convey the original design intent of the property, both on the exterior and the interior. The exterior may contain significant unique materials such as painted siding, shutters, decorative cornice brackets, porches, and dormers. While the exterior may contain a building's most prominent features, the interior may be even more important in conveying the building's history. Architectural features that indicate the building's history and character

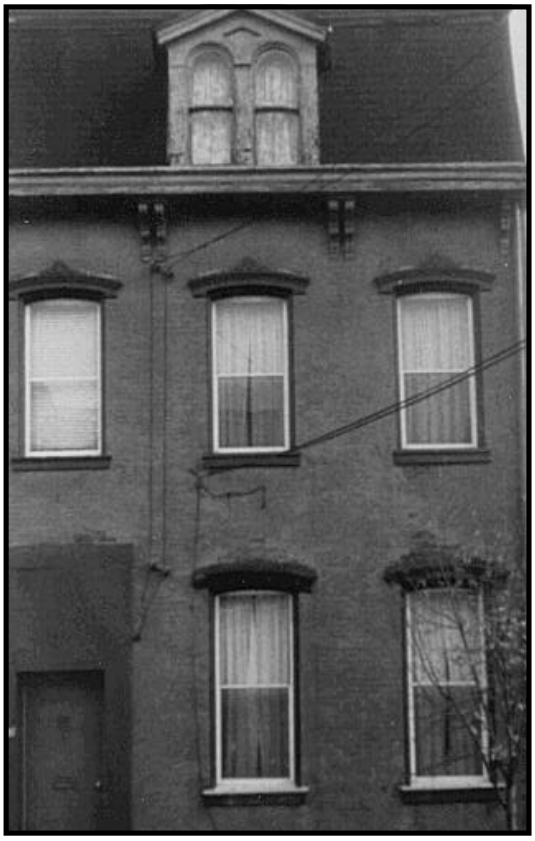

Figure 18.1 Historic Property Before Lead-Based Paint Was Chemically Removed From Exterior Masonry.

Figure 18.2 Historic Property After Lead-Based Paint Was Chemically Removed.

include marble or wood wainscoting in corridors, fireplace mantels, built-in book cases and cabinets, picture and chair rails, crown molding, baseboards, mantels, ceiling medallions and coffers, window and door trim, and staircases. Architectural finishes of note may include grained woodwork, marbled columns, and plastered walls.

Distinctive elements for painted surfaces are generally found in three categories:

- Materials: wood, plaster, stone, cast iron, brick, brass, "compo" (a simulated wood/plaster), roofing metal.
- Features: mantels, balusters, moldings, window and door trims, cast metal stair assemblies, paneled surfaces, milled siding, turned columns.
- Finishes: grained doors, stencilled borders, painted wallpapers, bronzed or gilded finishes.

For each historic property, some elements will be of lesser significance than others. As part of a survey of each historic property, the responsible entity should identify the elements that could be altered or removed without harming the integrity of the historic resource (e.g., plain plaster surfaces, simple board trim with no distinctive features, and nonhistoric intrusions, such as painted floors or replacement windows). Generally, the front facades of buildings will be more significant than the less visible side and rear elevations. Public spaces on the first floor, such as the entrance and staircase, will be more significant than private spaces, such as the bedroom, kitchen, and bath. This information will be important when decisions are made about

where to perform interim controls and where abatement or encapsulation is appropriate.

B. Risk Assessment/Paint Inspection

As with all lead-based paint evaluations, the responsible entity is also responsible for hiring a certified professional to evaluate lead hazards in the dwelling. Because of the need for special care around historic components, the advice of a risk assessor is very helpful when developing a lead hazard control plan. At the same time, any surfaces of historic significance that have been painted should be tested for the presence of lead as part of the evaluation of the dwelling. Ideally, a combination risk assessment/paint inspection should be conducted in historic buildings. At a minimum the risk assessor should perform x-ray fluorescence (XRF) tests on significant features so that the integrity of the elements is not damaged. When laboratory tests are required as a follow up to XRF testing, paint chips should be collected from inconspicuous locations. For properties of great historical significance, significant surfaces found to contain lead-based paint may benefit from additional laboratory analysis to determine the history of each colored layer (chromochronology). The purpose is to provide information on original colors should the property ever be restored. See Chapter 5 for more detail on risk assessments.

V. Establishing Priorities for Intervention

Significant elements should be treated with great care when physical intervention is considered as part of a lead hazard control plan. If the element is extremely significant (e.g., a carved mantel) and is in good condition, it should be disturbed as little as possible while still ensuring that lead hazards will be controlled. In this case interim controls are generally preferred (see Chapter 11). If the element is not particularly significant (e.g., a simple baseboard) and is in poor condition, then it may be acceptable to remove the entire feature and replace it with a duplicate or similar baseboard where possible. If the element is significant, but in deteriorated condition, then preservation measures should ensure that in the process of rebuilding or repairing the element, it is not further damaged. Careful paint removal and thorough cleaning of substrates is very time consuming, but may be appropriate for highly significant elements.

Good preservation practice calls for the removal of only deteriorated paint and the retention of paint layers well-bonded to the substrate, thus preserving the color chronology of the earlier historic paint layers. It is recommended that during interim control work, only the deteriorated topcoats of paint be removed and the remaining well-bonded paint be stabilized. The area can then be washed, reprimed, and covered with one or two topcoats of paint. For highly significant properties (e.g., those listed individually in the National Register of Historic Places) where significant paint layering is to be removed, paint samples should be collected, labeled, and stored by a historic preservation foundation or other organization.

VI. Selecting From the Various Methods of Paint Removal

When historic buildings are involved, the historic preservation goal is to retain as much of the original historic fabric as possible and to preserve the historic character of the resource. There is no simple method for determining which lead hazard treatment may be more or less damaging. It is possible, however, to describe how each treatment may or may not affect the historic character.

Suggested paint removal techniques for historic materials are as follows:

- Wet sanding of loose paint to bonded paint.
- Finish sanding using mechanical sanders with HEPA vacuum.
- Low-heat stripping with heat guns or heat plates (less than 450 °F, round-edge scraper).

- Solvent-based noncaustic stripper in place (not methylene chloride).
- Offsite stripping with heat, chemicals, or cold-tank dipping (be careful of glued joints).

Paint removal techniques that are not recommended:

- Torch or open-flame burning that can vaporize lead and burn substrates.
- Wet grit blasting (except for limited cast iron or concrete under containment).
- Caustic strippers that can raise wood grain (unless supervised by a trained specialist).
- Power sanding that can abrade wood surfaces.
- Hot-tank dipping that often disintegrates glued joints.

Interim controls that allow intact historic paint to remain in place (with topcoats of lead-free paint) are the least damaging to an element. These surfaces will have to be maintained. Records should be kept documenting the presence of lead underneath so that workers will use the proper protective methods during renovations or repair. Residents should be instructed to notify the owner or property manager whenever deterioration is detected.

The removal of lead-based paint down to the operable substrate, if carefully done, is the second least invasive treatment. Chemical, wet sanding, or low-heat removal of paint allows the substrate to stay intact and remain in place. However, these methods are time-consuming, and haphazard wet scraping or sanding may abrade delicate substrate finishes. If paint layering was determined to be significant, then it should be recorded with a preserved sample prior to paint removal.

One of the most invasive and potentially damaging paint removal treatments involves the removal of items for offsite stripping. If the items are easily removed (e.g., doors, shutters, or windows), they can potentially be reinstalled once treated. However, trim, mantels, banisters, newel posts, or other carved elements constructed in sections are often damaged when removed. Gouging, splitting, nail holes, and crowbar marks take their toll on the materials. The creation of leaded dust generally accompanies the removal of attached trim work. If care is taken during removal and stripping (using heat, chemicals, or wet sanding), damage can be reduced. It should be noted that in the process of dipping, glue joints can come apart. Only companies experienced in treating historic building parts should be used to conduct paint stripping. Too often, particularly for wooden elements, surfaces are gouged or grain is raised in an overly aggressive approach to paint removal. If elements deteriorate during the paint removal process, repairs or replacement of significant components should match the originals in size, material, and configuration. Less significant features should match the visual appearance as closely as possible.

Figure 18.3 Historic Property Where the Interior Woodwork and Staircase Were Wet Sanded and Recoated With Three Layers of Encapsulant To Preserve the Carved Profiles.

VII. Selecting Methods Other Than Paint Removal

If elements are too deteriorated to withstand paint removal or if they contain friction surfaces, it may be possible to replace these elements with new elements without threatening their historic integrity. This is particularly applicable to historic, double-hung wooden window sashes. If the windows have been identified as significant elements of the building, new window units that match as closely as possible the size, configuration, sash, mullion and muntin profile, and pane configuration should be installed. Replacement of too many significant features of a building, however, may jeopardize the historic integrity of the resource. For this reason only seriously deteriorated or unsalvageable materials should be replaced.

Encapsulating coatings, rigid encapsulant claddings, and wall enclosures affect historic resources in different ways. Depending on the overall visual effect of the resource, the long-term objectives of a preservation project, and the environmental climate of the resource, there will be differing degrees of success. For example, the use of an approved wall lining and skimcoating encapsulating system over deteriorated plaster with a finish coat of paint may be appropriate in a simple interior. However, encapsulating paint coatings over decorative woodwork would not be appropriate due to the viscous nature of the coating and the loss of the decorative wood detailing. The use of encapsulant coatings on exteriors of historic wooden buildings in moist or humid areas can have damaging long-term effects. Because the exterior coatings range from 10 to 14 mil, substrates may deteriorate because of moisture trapped behind the coating.

Figure 18.4 Deteriorated Window Sashes Were Replaced in This Historic Property While the Frames and Trim Were Wet Sanded and Repainted (vinyl liners were also installed as a friction reduction treatment).

Enclosing a decorative feature, such as a projecting mantel, might be possible if the fireplace is not to be used in the interim, and the decorative finishes are to be enclosed behind drywall finishes. While this is a serious loss of historic character, if it is a temporary solution and no harm is done to the feature, it might be an appropriate treatment. The use of artificial siding over painted historic exteriors often results in a removal of all projecting elements, such as roof brackets, and conceals the historic trim. The use of these artificial sidings is not recommended.

Complete removal of painted features and the failure to replace or replicate them is extremely damaging to the historic resource.

Proper maintenance is especially important in historic properties containing lead-based paint to avoid the creation of new hazards. For example, if bathroom leaks or other moisture sources deteriorate painted surfaces, paint chips or lead-contaminated dust could become a significant hazard. Residents should be advised to clean their dwellings and notify their building managers if deterioration occurs.

VIII. Conclusions

There are different levels of historic treatments appropriate to different levels of building significance and condition. Controlling lead hazards in historic buildings is a balancing act between several important objectives: childhood health, economic feasibility, and historic

preservation. For instance, abatement methods that permanently reduce lead hazards can have a more negative effect on the character of a historically significant home than interim controls. For homes of great historic significance, removing historic paint layers and their substrate can result in an irretrievable loss of materials and craftsmanship. Interim controls are more suitable as a long-term solution as long as the historic property is maintained in good condition. As deteriorated elements are repaired or replaced, much of the lead-based paint can be removed with appropriate methods. Retention of the maximum amount of historic material as possible is the goal of historic preservation; however, it need not be an obstacle to providing a lead-safe housing unit.

Historic Preservation Project Case Study

Case Study Project: 1890s row house, which is part of a National Register Historic District noted for its Victorian architecture. This was one of a group of rehabilitated low-to-moderate income rental units using a variety of Federal and State funding sources, including HUD grants to the local Housing and Community Development Agency (CDBG Block Grants). The buildings in the group are mostly brick, 3-story with side hall plans. Lead-based paint hazard control was part of the overall rehabilitation.

There is a Memorandum of Agreement (MOA) among the city, the State Historic Preservation Office (SHPO), and the Advisory Council on Historic Preservation (ACHP) that the rehabilitation of these buildings would conform to the Secretary of the Interior's Standards for the Treatment of Historic Properties (1992).

1. Historic Significance: The significance of each building in the project was established with the assistance of the State Historic Preservation Officer. In the case study example, both the exterior front facade with its distinctive mansard roof, as well as the interior with its traditional plan and period woodwork were significant. Individual features identified for preservation on the interior included an ornate staircase and banister, period woodwork, and trim around windows and doorways, and decorative ceiling medallions. The windows were wooden double-hung units with a curved top with simple large panes of glass in a one over one configuration; the exterior frames had a distinctive bullnose molding. Roof leaks made many upper floor ceilings structurally unsound. Less architecturally detailed areas were the bathrooms, the kitchen, and a rear addition.

2. Risk Assessment/Paint Inspection: The local Housing and Community Development Agency contracted with a certified risk inspector to test the property for the presence of lead-based paint and to identify the lead-based paint hazards, including dust and bare soil sampling. The paint inspection indicated that there was lead-based paint on the painted exterior brick, exterior windows, and all wooden trim and features inside and on glossy painted wall surfaces inside, such as the kitchen and bathrooms. The overall condition of the paint was deteriorated, and many plaster surfaces were water damaged, but the wooden trim underneath the paint was sound. The windows were in poor condition.

Historic Preservation Project Case Study (continued)

3. Lead Hazard Control: In consultation with the organization that was rehabilitating the property, the Housing and Community Development Agency established a lead hazard control plan as part of the building rehabilitation effort. The basic building plan configuration was retained with an upgrade of mechanical and electrical services. All deteriorating paint was removed by wet scraping, except for a few locations where encapsulants were used. New surfaces were installed to cover deteriorating paint.

   Exterior: The exterior was wet scraped to remove flaking paint and was repainted with a primer and an exterior oil/alkyd paint.

   Wall surfaces: Each room received new ceilings of drywall to replace water damaged and deteriorated plaster ceilings. Ceiling medallions were reinstalled. Most plaster walls were repaired and repainted, but the kitchen and bathroom walls and ceilings, which contained high levels of lead-based paint, were replaced with new drywall. The historic trimwork remained in place.

   Interior trim: All historic wooden trim remained in place and was repainted with special encapsulant coatings after wet sanding to remove loose lead-based paint. The ornate banister and handrail that had potentially chewable surfaces, were painted with three light coats of encapsulant to protect the decorative details and to avoid loss of detail due to the thickness of the paint.

   Windows: The window sashes were replaced with new sash matching the visual configuration of the historic sash which included an arched upper portion. The historic frames remained in place and received vinyl jamb liners to eliminate friction surfaces. The project was scheduled to have the window frames on the exterior boxed out and clad in white aluminum, but this treatment was eliminated after consultation with the State Historic Preservation Office because it would have altered a significant architectural feature on the primary facade. To preserve the distinctive bullnose moldings of these exterior frames, it was determined that the wood could either be wet sanded or chemically stripped to remove paint and repainted with oil/alkyd paint, or repainted with encapsulant paint coatings after stabilizing existing lead-based paint. Repainting with oil/alkyd after a mild chemical cleaning was selected for the exterior frames.

4. The scope of the work outlined by the Housing and Community Development Agency adhered to the Secretary of the Interior's Standards because it preserved the significant features of the building and provided for replacement in-kind or with compatible materials which replicated the historic appearance of the deteriorated originals. Had any of the above treatments called for removal or substantial alteration of significant features, the rehabilitation would have resulted in an adverse effect, requiring the city to obtain the Advisory Council's comments.

5. Upon completion of the projects, information was provided to the new occupants that outlined the damaging effects of lead-based paint and summarized the results of the hazard evaluation and control activities completed in the property. Included were several public health safety alert bulletins as well as instruction on how to maintain a lead safe house. These instructions stressed the importance of keeping housing units free of dust and dirt that might contain lead. Residents were encouraged to contact their local public health office, the Housing and Community Development Agency, or the managing office for the rental units should they suspect, in the future, that deteriorated paint surfaces might contain lead-based paint.