Understanding the Issues and Realities of Lead Paint and Its Impact on Pennsylvania’s Cultural Resources

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Co-Founder, Healthy Rowhouse Project
Why Does Lead Matter to Historic Preservation?

- Lead was a common ingredient in building paint until 1978
- 70% of Pennsylvania’s housing stock predates the 1970s
- Public policies and containment and remediation costs can affect preservation and rehabilitation decisions
What This Session Is About

- What are common sources of lead in the built environment?
- How significant/widespread is this issue in Pennsylvania?
- What are commonly accepted practices for containment and remediation?
- What are the requirements for working with lead paint in residential settings?
- How does lead paint impact housing rehabilitation programs that work at a neighborhood scale?
- How do you balance multiple maintenance needs with limited funding and conflicting requirements?
What This Session Is Not About

- Health impacts of lead
- Discussion of pending legislation or policies related to lead
- Advocacy directives for lead paint policies
HISTORIC BRIDGES

Presented By
Michael Cuddy, PE, Principal/Senior Vice President
TranSystems
PHOENIX SECTION WITH SEVERE DETERIORATION
LABORATORY TESTING

• **Microscopic Examination**
  – Number of Coats
  – Thickness of Coats
  – Microscopic Defects

• **Infrared Spectroscopy**
  – To identify generic paint type used

• **Atomic Absorption Spectroscopy**
  – To determine presence of hazardous materials
TESTING FOR HAZARDOUS MATERIALS

• Required for bridges suspected of having lead based paint (painted prior to 1990s)
  – Random, yet representative
  – Sandwich bag size, ¼” minimum depth
  – Collect coating completely down to the steel
  – Avoid rust, debris and contaminants
  – Properly label and send to CST for analysis

“Lead was finally removed from the primer specification in 1993, though existing stocks in District warehouses and maintenance yards were still being used.”
Ventilation must keep ambient Total Suspended particulate (TSP) lead below limits prescribed by (OSHA) 40 CFR 50.

AIR QUALITY AND EMISSION TESTING
Standard Requirements

- **Rigid floor system**
  - Formed from 20 gauge (min.) steel

- **Work platform**
  - Capable of supporting 25 PSF (min.) live load for abrasive blasting, or 10 PSF (min.) live load for water blasting

- **Watertight**
  - Ceiling and floors contoured to eliminate ponding

- **Walls**
  - Full height and capable of withstanding winds up to 30 MPH
An Abrasive Recycling System (with recyclable abrasive) is required when removing existing coatings containing hazardous materials.
CONTAINMENT SYSTEM
WASTE STORAGE AND DISPOSAL
### COSTS FOR REPAINTING OF LEAD-BASED PAINTED STEEL STRUCTURE

<table>
<thead>
<tr>
<th>ITEM</th>
<th>Range $/m² ($/ft²)</th>
<th>Average $/m² ($/ft²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Preparation</td>
<td>2-4</td>
<td>2.50</td>
</tr>
<tr>
<td>Containment</td>
<td>1-5</td>
<td>2.00</td>
</tr>
<tr>
<td>Disposal</td>
<td>0-3</td>
<td>0.50</td>
</tr>
<tr>
<td>Environmental Monitoring</td>
<td>0-2</td>
<td>0.50</td>
</tr>
<tr>
<td>Worker Health Monitoring</td>
<td>1-2</td>
<td>1.50</td>
</tr>
<tr>
<td>Overhead/Miscellaneous</td>
<td>0-2</td>
<td>0.50</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>4-18</td>
<td>7.50</td>
</tr>
</tbody>
</table>
Rustbond is a highly penetrating epoxy sealer designed for marginally prepared steel or overcoating existing (weathered) coatings.
Understanding the Issues and Realities of Lead Paint and What It Means for Pennsylvania’s Cultural Resources
SHROUDED HAND TOOL
REMOVING RUST WITH LASER
What is Lead?
Symptoms of Lead Poisoning

- Newborns
  - Learning difficulties
  - Slowed growth

- Young children (under 6 years old)
  - Irritability or aggressiveness
  - Hyperactivity, being easily distracted, impulsiveness
  - Learning problems
  - Lack of interest in play
  - Loss of appetite
Elevated Blood Lead Level

- Blood is tested
- Greater than 5µg/dL for children under 6
## Where is Lead Found?

<table>
<thead>
<tr>
<th>Lead Source</th>
<th>Contaminated Media</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead solder/pipes</td>
<td>Drinking water</td>
</tr>
<tr>
<td>Packages or storage containers</td>
<td>Food, beverages</td>
</tr>
<tr>
<td>Paint (pre-1978)</td>
<td>Household dust and soil</td>
</tr>
<tr>
<td>Production sources</td>
<td>Imported foods, remedies, cosmetics, jewelry</td>
</tr>
<tr>
<td>Mining and smelting</td>
<td>Outdoor air and dust</td>
</tr>
<tr>
<td>Workplaces involving lead</td>
<td>Outdoor and indoor air and dust</td>
</tr>
<tr>
<td>Gasoline (pre-1988)</td>
<td>Soil</td>
</tr>
</tbody>
</table>
All Natural Black Licorice Products recalled due to lead poisoning hazard. A recall has been issued for natural black licorice products from numerous states due to the candy containing excessive levels of lead. [September 5, 2008]

Water bottles recalled due to lead paint hazard. A recall has been issued for the Backyard and Beyond metal water bottles due to the bottles containing excessive levels of lead in the surface paint. They were sold at major retail stores nationwide from February 2006 through February 2008. [March 25, 2008]

New Kick Body Boards recalled due to lead paint hazard. A recall has been issued for the body boards due to the green surface paint on the logo on the underside of the body board containing excessive levels of lead. They were sold at Beachwear Outlet, Bargain Beachwear, Beach Village Inc., FJ Health & Beauty, Mor USA Inc., Shipwreck-Ocean Jewels, Walmart, and Wilcor International Inc., from January 2009 through May 2009. [June 18, 2009]
How do we find lead in a house?

X-ray fluorescence (XRF) or wipe samples
How do we prevent lead poisoning?

If renting, notify landlord about peeling paint
Clean up paint chips
Clean floors, window frames, and window sills with a general all-purpose cleaner weekly
  Don’t use a broom
Clean toys and wash hands!
Don’t sand or use flames to remove paint
Keep freshly painted
Eat a diet that is high in iron and calcium
Lead in Pennsylvania Homes

2014
Childhood Lead Surveillance
Annual Report
Lead in Pennsylvania

70% of the home in PA were built before 1978

<table>
<thead>
<tr>
<th>Source: U.S. Census Bureau, 2010 ACS, Table B25034</th>
<th>Housing Units:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Built Pre-1950</td>
<td>Estimated Built 1950 through 1977</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>Total Estimated Built Pre-1978</td>
</tr>
<tr>
<td>2,006,135</td>
<td>1,668,996</td>
</tr>
<tr>
<td>1,893,689</td>
<td>3,899,824</td>
</tr>
<tr>
<td>5,568,820</td>
<td>Total Housing Units</td>
</tr>
<tr>
<td></td>
<td>5,568,820</td>
</tr>
</tbody>
</table>
Lead in Pennsylvania

Percentage of Pennsylvania’s Housing Stock Built before 1978, by 2010 Census Tract

Percentage of housing units built before 1978:
- Yellow: 0.0 - 36.2
- Light Green: 36.3 - 54.8
- Green: 54.9 - 70.8
- Dark Green: 70.9 - 85.8
- Dark Blue: 85.9 - 100.0
PERCENTAGE OF BLLS 5 μg/dL AND ABOVE, CHILDREN UNDER 7

Percentage of Children w/ BLLs 5 μg/dL and above
- 2.42% - 6.89%
- 6.9% - 11.37%
- 11.38% - 15.64%
- 15.65% - 20.32%
- 20.33% - 24.79%
Children and Lead in Pennsylvania

BLLs of 5 μg/dL or above

*Please note that the results included in this chart are not confirmed BLLs, as confirmed BLLs are not tracked for levels of 5 to less than 10.
Currently, only child-occupied and residential properties

Renovation, Repair and Painting Rule

Lead-based Paint Disclosure Rule
Renovation, Repair and Painting Rule

April 2010

Target Housing – residence or child occupied facility built before 1978

6 square feet in any room or
20 square feet exterior
Requires firms to be registered by EPA - online registration
Requires contractors to be certified renovators - take 8 hour class - includes hands-on training - certification is good for 3–5 years
Landlords who do the work on their own properties also need to be registered as a firm and take the 8 hour course.
RRP (con)

How does RRP affect you?

Home owners and tenants

If building was built before 1978, worker should either assume there is lead present or test the areas that will be disturbed.
RRP (con)

Provide a pamphlet and have you sign that you received it
Sample Pre-Renovation Form

This sample form may be used by firms to document compliance with the requirements of the Federal Lead-Based Paint Renovation, Repair, and Painting Program.

Occupant Confirmation

Pamphlet Receipt

I have received a copy of the lead hazard information pamphlet informing me of the potential risk of the lead hazard exposure from renovation activity to be performed in my dwelling unit. I received this pamphlet before the work began.

Printed Name of Owner-occupant

<table>
<thead>
<tr>
<th>Signature of Owner-occupant</th>
<th>Signature Date</th>
</tr>
</thead>
</table>

Renovator's Self Certification Option (for tenant-occupied dwelling; only)

Instructions to Renovator: If the lead hazard information pamphlet was delivered but a tenant signature was not obtainable, you may check the appropriate box below.

- Declined - I certify that I have made a good faith effort to deliver the lead hazard information pamphlet to the rental dwelling unit listed below at the date and time indicated and that the occupant declined to sign the confirmation of receipt. I further certify that I have left a copy of the pamphlet at the unit with the occupant.

- Unavailable for signature - I certify that I have made a good faith effort to deliver the lead hazard information pamphlet to the rental dwelling unit listed below and that the occupant was unavailable to sign the confirmation of receipt. I further certify that I have left a copy of the pamphlet at the unit by sliding it under the door or by (fill in how pamphlet was left).

Printed Name of Person Certifying Delivery

<table>
<thead>
<tr>
<th>Attempted Delivery Date</th>
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</table>

Signature of Person Certifying Lead Pamphlet Delivery

Unit Address

Note Regarding Mailing Option — As an alternative to delivery in person, you may mail the lead hazard information pamphlet to the owner and/or tenant. Pamphlet must be mailed at least 7 days before renovation. Mailing must be documented by a certificate of mailing from the post office.
If positive for lead (or assumed lead), worker will need to:

- Use Lead Safe Work Practices
- Perform cleaning verification
Lead Safe Work Practices

Worker needs to post warning signs

Should define the work area

In apartments, common areas should have signs also
Lead Safe Work Practices (con)

Interior work

Remove everything from the room that can be moved

Or, cover with plastic, sealed with tape
Lead Safe Work Practices (con)

Cover the floor surface (including carpet) with taped-down plastic sheeting in the work area 6 feet from the area of disturbed paint.
Lead Safe Work Practices (con)

Close windows and doors in the work area.

If workers will need to go through a door, the door it must be covered in a way that allows workers to pass, but also confines dust and debris to the work area.
Lead Safe Work Practices (con)

Close and cover all ducts opening in the work area with taped-down plastic sheeting.

Ensure that all personnel, tools, and other items, including the exteriors of containers of waste, are free of dust and debris before leaving the work area.
Lead Safe Work Practices (con)

Exterior Work

Cover ground with plastic sheeting or other disposable impermeable material extending 10 feet beyond the perimeter of surfaces undergoing renovation or a sufficient distance to collect falling paint debris, whichever is greater.

If the renovation will affect surfaces within 10 feet of the property line, then vertical containment or equivalent extra precautions must be erected to prevent contamination of adjacent buildings and property.
Close all doors and windows within 20 feet of the renovation.

Doors within the work area that will be used while the job is being performed are covered with plastic sheeting.

Vertical Containment
Lead Safe Work Practices (con)

Clean up

All paint chips and debris should be cleaned up

Plastic sheeting should be misted with water and then folded dirty side in to limit contamination. Sheeting should be disposed as waste.

In general, waste can be disposed as household waste.
For interior work:

Contractor must clean all objects and surfaces in the work area and within 2 feet of the work area, cleaning from higher to lower:

Walls - clean with a HEPA vacuum or wiping with a damp cloth

Remaining surfaces - vacuum with a HEPA vacuum. The HEPA vacuum must be equipped with a beater bar when vacuuming carpets and rugs.

Wipe all remaining surfaces and objects in the work area, except carpet or upholstery, with a damp cloth. Mop uncarpeted floors thoroughly.
RRP Enforcement

Mainly, office inspections

Is paperwork in order?

Receipts for pamphlet

Checklist for lead safe work practices

Some active work site inspections

Lead safe work practices

Fines vary depending on age of any children in the home
Lead Based Paint Disclosure Rule

Went into effect in 1996

Target Housing – residence or child occupied facility built before 1978

Buying or selling a house

Renting
Lead Based Paint Disclosure Rule (con)

Basic requirements

Lead Warning Statement
Seller or landlord must provide knowledge of lead
Buyer or tenant must receive pamphlet
If agent is used, must have an agent’s statement

Sales
Buyer must receive a chance to have a lead paint inspection within 10 days of the contract
Lead Based Paint Disclosure Rule (con)
Disclosure of Information on Lead-Based Paint and/or Lead-Based Paint Hazards

Lead Warning Statement
Every purchaser of any interest in residential real property on which a residential dwelling was built prior to 1978 is notified that such property may present exposure to lead from lead-based paint that may place young children at risk of developing lead poisoning. Lead poisoning in young children may produce permanent neurological damage, including learning disabilities, reduced intelligence quotient, behavioral problems, and impaired memory. Lead poisoning also poses a particular risk to pregnant women. The seller of any interest in residential real property is required to provide the buyer with any information on lead-based paint hazards from risk assessments or inspections in the seller’s possession and notify the buyer of any known lead-based paint hazards. A risk assessment or inspection for possible lead-based paint hazards is recommended prior to purchase.

Seller’s Disclosure
(a) Presence of lead-based paint and/or lead-based paint hazards (check (i) or (ii) below):
   (i) ______ Known lead-based paint and/or lead-based paint hazards are present in the housing (explain).

   (ii) ______ Seller has no knowledge of lead-based paint and/or lead-based paint hazards in the housing

(b) Records and reports available to the seller (check (i) or (ii) below):
   (i) ______ Seller has provided the purchaser with all available records and reports pertaining to lead-based paint and/or lead-based paint hazards in the housing (list documents below).

   (ii) ______ Seller has no reports or records pertaining to lead-based paint and/or lead-based paint hazards in the housing.

Purchaser’s Acknowledgment (initial)
(c) ______ Purchaser has received copies of all information listed above.
(d) ______ Purchaser has received the pamphlet Protect Your Family from Lead in Your Home.
(e) Purchaser has checked (i) or (ii) below:
   (i) ______ received a 10-day opportunity (or mutually agreed upon period) to conduct a risk assessment or inspection for the presence of lead-based paint and/or lead-based paint hazards; or
   (i) ______ waived the opportunity to conduct a risk assessment or inspection for the presence of lead-based paint and/or lead-based paint hazards.

Agent’s Acknowledgment (initial)
(f) ______ Agent has informed the seller of the seller’s obligations under 42 U.S.C. 4852d and is aware of his/her responsibility to ensure compliance.

Certification of Accuracy
The following parties have reviewed the information above and certify, to the best of their knowledge, that the information they have provided is true and accurate.

<table>
<thead>
<tr>
<th>Seller</th>
<th>Date</th>
<th>Seller</th>
<th>Date</th>
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<table>
<thead>
<tr>
<th>Purchaser</th>
<th>Date</th>
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<tbody>
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</table>

<table>
<thead>
<tr>
<th>Agent</th>
<th>Date</th>
<th>Agent</th>
<th>Date</th>
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</tbody>
</table>
Sample Disclosure Format for Target Housing Rentals and Leases
Disclosure of Information on Lead-Based Paint and Lead-Based Paint Hazards

Lead Warning Statement
Housing built before 1978 may contain lead-based paint. Lead from paint, paint chips, and dust can pose health hazards if not taken care of properly. Lead exposure is especially harmful to young children and pregnant women. Before renting pre-1978 housing, landlords must disclose the presence of known lead-based paint and lead-based paint hazards in the dwelling. Tenants must also receive a Federally approved pamphlet on lead poisoning prevention.

Lessor's Disclosure (initial)
_____ (a) Presence of lead-based paint or lead-based paint hazards (check one below):
   [ ] Known lead-based paint and/or lead-based paint hazards are present in the housing (explain).
   [ ] Lessor has no knowledge of lead-based paint and/or lead-based paint hazards in the housing.

_____ (b) Records and reports available to the lessor (check one below):
   [ ] Lessor has provided the lessee with all available records and reports pertaining to lead-based paint and/or lead-based paint hazards in the housing (list documents below).
   [ ] Lessor has no reports or records pertaining to lead-based paint and/or lead-based paint hazards in the housing.

Lessee's Acknowledgment (initial)
_____ (c) Lessee has received copies of all information listed above.
_____ (d) Lessee has received the pamphlet Protect Your Family from Lead in Your Home.

Agent's Acknowledgment (initial)
_____ (e) Agent has informed the lessor of the lessor's obligations under 42 U.S.C. 4582(d) and is aware of his/her responsibility to ensure compliance.

Certification of Accuracy
The following parties have reviewed the information above and certify, to the best of their knowledge, that the information provided by the signatory is true and accurate.

Lessor Date
Lessor Date
Lessee Date
Lessee Date
Agent Date
Agent Date
What can be done to preserve architectural elements?

- Keep freshly painted
- Clean up paint chips
- Clean floors, window frames, and window sills with a general all-purpose cleaner weekly
- Don’t use a broom – wet mop
- Don’t sand or use flames to remove paint
- Eat a diet that is high in iron and calcium
EPA Lead Hotline
1(800) 424-LEAD [5323]

EPA Website:  www.epa.gov/lead

To file a tip:  www.epa.gov/tips

Kyle Chelius
215-814-3178
chelius.kyle@epa.gov
An initiative of the Philadelphia Center for Architecture + Design
Philadelphia's signature housing type

Everyone walked to work or took public transportation, strong social fabric, vibrant street life.

**But,** unsafe workplaces, poor air quality and dangerous materials like lead paint.
Density

Those values are returning as we see the effects of isolation and inactivity on our health.

And, we have much safer workplaces and homes, and regulations on air quality and interior materials.
Healthy Rowhouse Project

Goal

5,000 houses per year
x $10,000 per house

= $50 million
Getting rid of lead paint dangers = generations with fewer barriers to success

The Lead Abatement Strike Team (LAST) was developed in 2002 by the Philadelphia Department of Public Health.

At that time, 1,400 backlog properties were found housing at least one child with elevated blood lead levels.
Elevated Blood Lead Levels in Philadelphia children

Of 40,000 vulnerable children tested.....

From 2011 to 2014 BLLs > 5 ug/dL declined from 4,670 to 3,827 in ages 0 to 15 (10.25% to 10.16%)

From 2011 to 2014 BLLs > 10 ug/dL declined from 1,015 to 759 in ages 0 to 15 (2.3% to 1.9%)
Lead Paint in Homes

Center for Disease Control recommends that children and pregnant women should avoid homes built before 1978.
Do we really want to avoid these houses?

89% of homes in Philadelphia were built before 1979

368,000 homes were built before 1950
Money for Repairs - Existing sources

- Community Development Block Grants
- Pennsylvania Housing Finance Agency
- Philadelphia Housing Trust Fund
- PHIL-Plus and Mini-PHIL loans
- US Department of Energy Weatherization Assistance Program

*All are either shrinking, spoken for, not available to landlords or not available to houses in poor condition, and many funds are restricted to addressing specific issues, like energy efficiency.*
Money - Potential sources for home repair

- Bank Program Related Investments and obligations under the Community Revitalization Act
- New National Housing Trust Fund, December 2014
- Medicare and Medicaid will soon both require hospitals to restrict readmissions and to deal with root causes instead. A hospital with for-profit functions could offset its obligations with contributions to healthier housing, if a state tax credit for that purpose.

- HUD Healthy Homes funding
- Municipal bonds, as in AustinGO!
- Social Impact investing
- New ideas, like "1% for Healthy Houses" - impact fee based on 1% for Art programs
- Foundation support to start up a revolving fund
Models from other cities

CHICAGO  MILWAUKEE  BALTIMORE  SEATTLE, ST PAUL, FLINT  DETROIT
Chicago

The non-profit Community Investment Corporation created a $415 million loan pool for multifamily rehabilitation and has rehabbed 50,000 housing units and won a MacArthur Award for Creative and Effective Institutions.
Milwaukee

The Rental Rehabilitation Program provides forgivable zero interest loans to landlords up to $15,000, paired with an intensive inspection program to ensure that the units are kept in good condition.
Baltimore

Local utilities provide a $50 million fund: When Exelon bought the utility Constellation Energy, they funded a city program.
Seattle, St Paul, Flint

For homeowners in those neighborhoods where property values are increasing, several US counties offer deferred loans to low- and moderate-income homeowners.
Detroit

An $8 million fund provides 0% Interest Home Repair Loans.
Goals: First grant

1. Get home repair on the radar. Encourage the next Mayor and Council members to adopt bold housing and public health policies that balance the preservation of existing affordable housing at scale with construction of new units. Timing worked.

2. Identify a set of funding sources to create a revolving fund to fund home repair at scale.

3. Create new allies to promote home repair and connect with trusted partners to make those repairs happen, at scale, for those who need them most.
Goals: Second grant 2016

1. Define the scope, get the data. How many privately owned rental housing units? How many owner-occupied? What levels of repair are needed? Identify areas of very low-income residents.

2. Research delivery models.

3. Identify funding and financing mechanisms.
Goals: 2017

1. Based on data from Year 1, match financing mechanisms to needs of landlords or homeowners; gentrifying neighborhoods where houses are gaining value or those with stagnant values.

2. Propose a structure for service delivery models - at least one for rentals, one for homeowners. Establish ways for contractors to participate - insurance, local hiring, etc.

3. Involve potential clients and trusted partners in program design. What are barriers to acceptance of assistance - cost, dislike of taking loans, distrust of anyone offering loans (based on current scams), market conditions, how this will impact handing down house to children.
Goals: 2018

1. Repair groups of houses in demonstration area.

2. Engage and queue up existing organizations waiting to use the financing and delivery tools.

3. Set up specific liaisons with trusted partners in medical and social service sectors to begin referring people in need, writing each one the equivalent of an Rx for a healthy home.
Q&A