Lead Abatement Refresher Course with Lead Safe Renovator Qualification

Instructor: Jamie Papian

Accredited Training Provider
Lead Inspector
Lead Abatement Contractor
Asbestos Inspector
Asbestos Supervisor
Certified Indoor Environmentalist

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Background Information

- History of Lead Use
- Health Affects of Lead Exposure in Children & Adults
- Housing Statistics and Ways to Reduce Exposure
- Blood Lead Levels and Surveillance

Regulatory Information

- EPA
- HUD
- OSHA / Lead in Construction Standard
- State of Iowa Administrative Code 641 Chapters 68, 69, 70

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Role of the Abatement Worker

- Identification of Lead Based Paint and Lead Based Hazards
- Working with Lead in the Construction Industry.
- Lead Check Test Kit
- Personal Protective Equipment.
- Action Level and Permissible Exposure Levels
- Task Related Triggers.
- Worksite Preparation

Role of the Abatement Contractor

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Methods of Abatement

- Definitions
- Prohibited Work Methods
- Types of Abatement
- Types of Interim Control
- Clean Up
- Clearance Testing

Lead Safe Renovator

- General Information-
- Who must follow the RRP rule
- Responsibilities of the Firm and Individual
- Exemptions
- On the Job Training
- Record Keeping

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Lead poisoning is one of the most common and preventable pediatric health problems today.

- Centers for Disease Control and Prevention

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DEFINITION OF LEAD-BASED PAINT

Paint or other surface coatings that contain lead equal to or in excess of 1.0 milligrams per square centimeter, or more than 0.5 percent by weight.

- Lead-based paint is paint or other surface coating that contains lead at or above established limits
- The Federal and state of Iowa standard is greater than or equal to 1.0 mg/cm^2 or greater than 0.5% by weight
- It is the primary source of lead poisoning and lead-contaminated dust in housing and child-occupied facilities

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HISTORY OF LEAD-BASED PAINT

In 1973, Congress limited the level of lead in paint to 0.5% by weight for residential uses. In 1978, Congress limited the level of lead in new paint to 0.06% by weight for residential uses.

In 2008 CPSC further reduced the allowable amount of lead to 0.009%

How Much Lead Was In The Paint?

- At the peak of white lead production, the level of lead in exterior paint ranged as high as 25% to 50% by weight.

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REASONS LEAD WAS ADDED TO PAINT

- **Pigmentation**
- **Durability**
- **Corrosion resistance**
- **Inhibited mold growth**

Lead can also be found in primers, stains, varnishes, and shellacs

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HISTORY OF LEAD

- **Negative health effects of lead have been recognized since the 18th century.**
- **Austria and European countries banned lead in interior paint in 1910. Other countries banned it in 1920.**
- **Lead in residential paint was banned in the U.S. by the Consumer Product Safety Commission in 1978.**

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SOURCES OF LEAD EXPOSURE

Lead hazards from "target housing" and child-occupied facilities are the main source of lead poisoning in children. These include:

- Chewable surfaces.
- Impact surfaces.
- Friction surfaces.
- Deteriorated interior paint.
- Contaminated household dust.
- Deteriorated exterior paint.
- Contaminated bare soil.

Intact paint is not an immediate hazard, but may become a hazard when it is disturbed.

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SOURCES OF LEAD EXPOSURE

Chewable Surfaces

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SOURCES OF LEAD EXPOSURE

Impact Surfaces

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SOURCES OF LEAD EXPOSURE

Friction Surfaces

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SOURCES OF LEAD EXPOSURE

Contaminated Household Dust

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SOURCES OF LEAD EXPOSURE

Deteriorated Indoor Paint

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SOURCES OF LEAD EXPOSURE

Contaminated Bare Soil

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OTHER SOURCES OF LEAD

- Toys
- Pottery/Ceramics
- Jewelry
- Candy/Wrappers from outside U.S.
- Fishing sinkers
- Ethnic Make-Up
- Ethnic Remedies





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LEAD IS A POISON

- Lead has no biological value.
- There can be acute exposures and chronic exposures.
- If lead exposure continues, lead will build up in the body and can remain in the bones for a very long period of time.

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WHO CAN BE AFFECTED BY LEAD POISONING

- Children
- Women of child bearing age
- Adults working in construction, general rehabilitation, painting renovation, restoration, and demolition
- The families of lead-exposed workers are at risk because workers can bring lead dust home on their clothes

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HOW HUMANS ARE EXPOSED TO LEAD

- **Ingestion:** through the mouth (eating)
- **Inhalation:** through the nose (breathing)
- **In vitro:** from pregnant moms to unborn babies

The longer the exposure and the larger the amount of lead, the greater the concentration of lead in the body.

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SYMPTOMS OF CHILDHOOD LEAD EXPOSURE

- Fatigue, Irritability
- Stomachache, Cramps, Vomiting
- Constipation, Poor Appetite
- Headaches
- Behavior & learning problems, Attention Deficit
- Damage to brain, nervous system, and kidneys
- Slowed Growth
- Hearing Problems
- Anemia

It is difficult to diagnose lead poisoning based on these symptoms

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SYMPTOMS OF LEAD EXPOSURE IN ADULTS

- **Numbness in hands and feet**
- **Muscle and joint pain**
- **"Wrist drop"**
- **Weakness in arms and legs**
- **Loss of sex drive**
- **Kidney problems**
- **High blood pressure**

It is difficult to diagnose lead poisoning based on these symptoms.

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LEAD POISONED?

- **Most lead-poisoned children and adults do not have obvious symptoms.**
- **A blood test is the only 'true" way to know if a person's blood lead level is elevated.**

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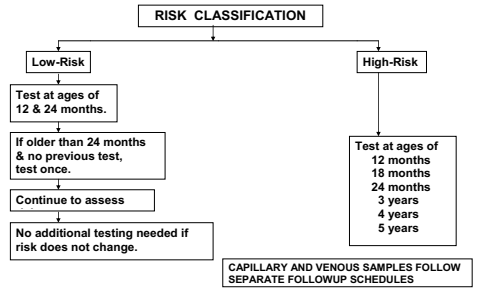
LEAD POISONED?

BASIC LEAD TESTING CHART
(Based on Risk and Age)



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CHILDHOOD BLOOD LEAD LEVEL SURVEILLANCE IN IOWA

The results of all blood lead testing done on adults and children must be reported to the Iowa Department of Public health.

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ELEVATED BLOOD LEAD LEVELS

Adults-

- CDC recommends adults to keep their lead level below: 5µg/dL.
- OSHA standards say if a worker has a level >50 µg/dL the worker must be removed from job AND cannot return to work until their level is ≤ 40µg/dL

Children- CDC- reference value:

- Are considered lead poisoned at a level of ≥5µg/dL
- At a level of ≥20µg/dL or two tests between15-19 µg/dL, an environmental inspection of home is performed

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Table 1. Studies on Lead and Educational Outcomes

Blood Lead Levels	Educational Impact	Size of Study	Location of Study
≤ 3 µg/dL	Decreased end of grade test scores	More than 57,000 children	North Carolina (Miranda et al. 2009)[1]
4 µg/dL at 3 years of age	Increased likelihood learning disabled classification in elementary school	More than 57,000 children	North Carolina (Miranda et al. 2009)[1]
	Poorer performance on tests	35,000 children	Connecticut (Miranda et al. 2011)
5 µg/dL	30% more likely to fail third grade reading and math tests	More than 48,000 children	Chicago (Evens et al. unpublished data)
	More likely to be non-proficient in math, science, and reading	21,000 children	Detroit (Zhang et al. 2013)
5-9 µg/dL	Scored 4.5 points lower on reading readiness tests	3,406 children	Rhode Island (McLaine et al. 2013)
≥10 µg/dL	Scored 10.1 points lower on reading readiness tests	3,406 children	Rhode Island (McLaine et al. 2013)
10 and 19 µg/dL	Significantly lower academic performance test scores in 4th grade	More than 3,000 children	Milwaukee (Amato et al. 2012)
≥ 25 µg/dL	$0.5 million in excess annual special education and juvenile justice costs	279 children	Mahoning County, Ohio (Stefanak et al. 2005)

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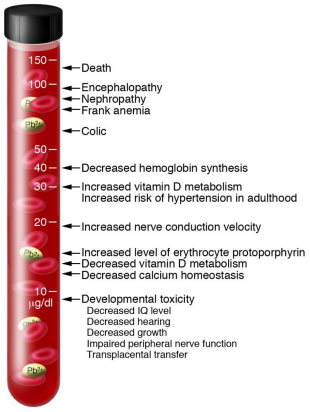
Inorganic Lead: The lowest observed effects in children



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HOW LONG DOES LEAD STAY IN THE BODY?

- **Lead initially shows up in the blood. If exposure stops, the turnover time for lead in blood is 30 to 60 days.**
- **If exposure continues, lead enters soft tissue (organs). If exposure stops, the turnover time for lead in soft tissue is 60 to 90 days.**
- **If exposure continues, lead enters bone. If exposure stops, the turnover time for lead in bones is approximately 40 years.**

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THE ROLE OF NUTRITION IN REDUCING LEAD ABSORPTION

- **Children who eat regular meals and snacks absorb less lead than children who ingest lead on an empty stomach**
- **Extremely high fat diets can increase lead absorption**
- **Children with adequate calcium and iron intake absorb less lead**

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TEMPORARY ENVIRONMENTAL & BEHAVIORAL INTERVENTIONS TO REDUCE LEAD EXPOSURE IN CHILDREN

- **Keep children away from areas of peeling and chipping paint**
  - Close windows where they like to play
  - Keep them out of the room with the deteriorated paint
  - Put contact paper on areas of deteriorated paint
  - Move outdoor play areas away from the house
- **Keep children out of the area when disturbing lead-based paint**

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TEMPORARY ENVIRONMENTAL & BEHAVIORAL INTERVENTIONS TO REDUCE LEAD EXPOSURE IN CHILDREN

- **Keep the house clean enough to pass the "white glove" test.**
- **Wash the child's hands and toys frequently, especially before they eat**
- **Try to keep children from putting their hands, paint chips, soil, etc., in their mouths**

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LONGER-TERM ENVIRONMENTAL AND BEHAVIORAL INTERVENTIONS TO REDUCE LEAD EXPOSURE IN CHILDREN

- Repair peeling and chipping paint safely and keep it in good condition.
- Keep the house clean enough to pass the "white glove" test.
- Wash the child's hands and toys frequently, especially before they eat.

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ENVIRONMENTAL INTERVENTIONS TO REDUCE LEAD EXPOSURE IN ADULTS

- Reduce the amount of dust and fumes produced when working with lead or lead-based paint.
- Wear respiratory protection to reduce the amount of lead inhaled.
- Wash hands and face before eating, drinking, or smoking.

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ADDITIONAL PRECAUTIONS FOR PREGNANCY

- If possible, do NOT work with lead at all
- More frequent blood lead testing
- More respiratory protection
- Special attention to protective clothing and hygiene

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MEDICAL TREATMENTS FOR LEAD POISONING

- Children with elevated blood lead levels are often iron deficient. This should be treated with an iron supplement
- Children with blood leads ≥45 µg/dL and adults with blood lead levels ≥70 µg/dL usually receive medication to remove lead from their bodies
- Medical treatment is never a substitute for reducing lead exposure

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US and Iowa Housing Data

Year - PRE	US %	Iowa %	Rank
1940	12.8	26	6
1950	17.90	31.4	6
1960	28.3	41.6	7
1970	39.2	52.2	10

Source: US Census, ACS Data 2017.

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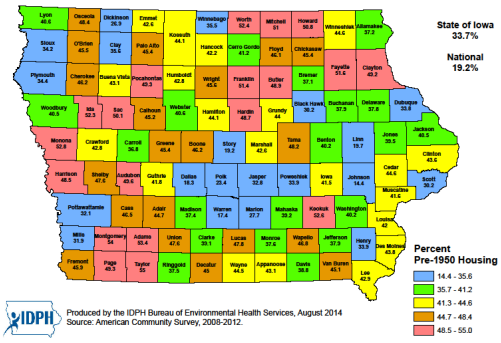
Housing Built Before 1950 -- ACS 2008-2012



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REGULATIONS

- U.S. Environmental Protection Agency (EPA)
- U.S. Department of Housing and Urban Development (HUD)
- U.S. Occupational Safety and Health Administration (OSHA)
- Iowa Occupational Safety & Health (IOSH)
- State of Iowa

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REGULATORY BACKGROUND

TITLE X:

THE RESIDENTIAL LEAD-BASED PAINT HAZARD REDUCTION ACT OF 1992

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REGULATORY BACKGROUND

The major provisions of Title X are:

- Development of new HUD guidelines for dealing with lead-based paint in publicly-owned and private housing
- Real estate disclosure before selling or leasing a dwelling
- Certification of lead inspectors and lead abatement contractors
- Notification prior to renovation or remodeling
- Additional requirements for privately-owned housing receiving financial assistance from HUD

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EPA REGULATIONS

U.S. Environmental Protection Agency (EPA):

- Established accredited training and certification programs for lead abatement workers and contractors and for inspectors and risk assessors who look for lead-based paint
- Established real estate disclosure regarding lead
- Established requirements for pre-renovation education
- Promulgated the Renovation, Repair, and Painting Program Final Rule (RRP Rule)

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HUD REGULATIONS

U.S. Department of Housing and Urban Development (HUD):

- Also enforces real estate disclosure regarding lead
- Established lead hazard control grant programs
- Established regulations for lead-based paint evaluation and control of lead-based paint hazards in HUD-assisted housing

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HUD GUIDELINES

- **Development of new HUD guidelines was completed in 1995**
- **These guidelines contain standards for conducting inspections, interim controls, and abatement in both public and private housing**
- **These GUIDELINES do not have the force of law**
- **The only time inspectors are required to follow these guidelines is if their use is specified by a contract or special program**

Note: In Iowa, Chapter 70 does have the force of law

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WHAT DO THE HUD RULES REQUIRE?

HOUSING REHABILITATION

- Property up to $25,000: Lead hazards must be controlled (NOT abated). The people doing the work must have completed the 8-hour Lead Safe Renovator training
- Property receives >$25,000: Lead hazards must be ABATED. Work must be done by certified lead abatement contractors and lead abatement workers
- On all projects, clearance testing must be passed when the work is done

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WHAT DO THE EPA/HUD RULES REQUIRE?

REAL ESTATE DISCLOSURE

In **sales** of target housing, the **SELLER** must:

1. Fill out a standard form indicating whether they have specific knowledge of lead-based paint or lead-based paint hazards in the dwelling and provide this form to the buyer.
2. Provide copies of any inspection reports to the buyer.
3. Provide a copy of the EPA or a state-approved pamphlet to the buyer.
4. Allow the buyer 10 days to get a lead inspection if the buyer wants an inspection.

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WHAT DO THE EPA/HUD RULES REQUIRE?

REAL ESTATE DISCLOSURE

In the **rental** of target housing, the **landlord** must:

1. Fill out a standard form indicating whether they have specific knowledge of lead-based paint or lead-based paint hazards in the dwelling and provide this form to the renter
2. Provide copies of any inspection reports to the renter
3. Provide a copy of the EPA or a state-approved pamphlet to the renter

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CERTIFICATION OF LEAD INSPECTORS AND LEAD ABATEMENT CONTRACTORS

Title X required EPA to develop regulations to require certification of lead inspectors and lead abatement contractors.

Iowa's Rule: IAC--641--Chapter 70

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CERTIFICATION OF LEAD INSPECTORS AND LEAD ABATEMENT CONTRACTORS (cont'd)

- Lead professionals had to be certified by March 1, 2000.
- EPA will certify individuals only in states where there is NOT an EPA-authorized program.
- EPA will NOT certify individuals in Iowa.

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IOWA CERTIFICATION REQUIREMENTS

- **Sampling technicians, inspector/risk assessors, EBL inspectors, lead abatement worker, lead abatement contractors, and renovators must be certified**
- **Must meet education and experience requirements.**
- **Inspector/risk assessors and lead abatement contractors must pass a third party exam.**
- **Individuals must pay fee each year and take a refresher course every three years.**

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IOWA CERTIFICATION REQUIREMENTS (cont'd)

- **Firms must be certified (free) and sign a statement that they will only use certified employees**
- **Lead inspections, lead free inspections, risk assessments, lead hazards screens, clearance testing, and abatement MUST be conducted according to regulations**
- **A person may be certified as both an inspector and a contractor, but must inform customers of the potential conflict of interest**
- **Owner-occupants do not have to be certified if EBL child lives there**

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IOWA ADMINISTRATIVE CODE 641- CHAPTER 68 Control of Lead Based Paint Hazards

- **Requires property owners to repair lead-based paint hazards in properties where lead-poisoned children live or have spent time.**
- **Counties may adopt this regulation by reference or may have a similar local regulation.**

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IOWA ADMINISTRATIVE CODE 641- CHAPTER 69 Notification Prior To Renovation, Remodeling or Repainting

This rule went into effect in Iowa on June 1, 1999. The provisions are similar to those of the real estate disclosure rule:

- affects all target housing and child occupied facilities and requires the contractor (including landlords) give a standard notification and the EPA or a state-approved pamphlet prior to starting a renovation, remodeling, or repainting project.
- Does not apply to abatement done by a certified abatement contractor.

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IOWA ADMINISTRATIVE CODE 641- CHAPTER 69 Notification Prior To Renovation, Remodeling or Repainting (cont'd)

EPA Approved Pamphlet

State of Iowa Approved Pamphlet

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TRAINING & CERTIFICATION OF LEAD PROFESSIONALS Iowa's Rule: IAC--641--Chapter 70

EPA's final regulations for training and certification of lead professionals were published on August 29, 1996. States had until August 1998 to have programs authorized by EPA.

- **EPA is operating the program in states that are not authorized**
- **Currently about 30 states, including Iowa, have authorized certification programs**
- **All contractors and workers must follow the regulations written in chapter 70**

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ENFORCEMENT OF TITLE X REGULATIONS

- **Contractor and inspector certification and notification prior to renovation or remodeling can be delegated to states**
- **If delegated to states, the states will do enforcement. If not, EPA will do enforcement**
- **Real estate disclosure cannot be delegated to states**
- **EPA and HUD both will do enforcement**

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OCCUPATIONAL SAFETY HEALTH ADMINISTRATION (OSHA)

Lead in Construction Standards 29 CFR 1926.62

OSHA REQUIREMENTS FOR RESIDENTIAL LEAD HAZARD CONTROL WORK

- Iowa Occupational Safety and Health (IOSH) Program
- Work covered by standard
- Written compliance plans and competent person
- Exposure assessment
- Task-related triggers
- Engineering and work practice controls
- Respiratory protection plan
- Protective clothing and equipment

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OSHA REQUIREMENTS FOR RESIDENTIAL LEAD HAZARD CONTROL WORK (cont'd)

- Housekeeping
- Hygiene facilities and practices
- Medical surveillance
- Medical removal protection
- Hazard communication programs and training on lead exposure
- Specific operations causing lead exposure
- Recordkeeping
- Observation of monitoring

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IOWA OCCUPATIONAL SAFETY AND HEALTH (IOSH) PROGRAM

- **Iowa is a "state plan" state**
- **IOSH enacts and enforces worker protection standards in Iowa**
- **IOSH is part of Iowa Workforce Development**
- **Enforcement and consultation programs**

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IOWA OCCUPATIONAL SAFETY AND HEALTH (IOSH) PROGRAM

IOSH ENFORCEMENT PROGRAM

Contact: Jeff Ellis 515/281-6768

IOSH CONSULTATION PROGRAM

Contact: Joe Mullen 515/281-6308

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WORK COVERED BY THE LEAD IN CONSTRUCTION STANDARD

- Demolition or salvage of structures containing lead
- Removal, enclosure, or encapsulation
- Renovation, alteration, repair, or construction or structures coated with lead-based paint
- Lead cleanup
- Transportation, storage, disposal, or containment of lead debris onsite
- Any maintenance work

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WORKER EXPOSURE LEVELS

1. Action Level (AL) of 30 µg/m³ in air
2. Permissible Exposure Level (PEL) of 50 µg/m³ in air

Both measures are expressed as an 8-hour time-weighted average.

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WORK SHIFTS LONGER THAN 8 HOURS

Total exposure cannot exceed 400 µg/m³.

$$\text{Adjusted PEL} = \frac{400}{\text{Number of hours worked}}$$

Example: Work day is 10 hours.

400/10 = 40.

PEL = 40 µg/m³.

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MEETING THE REQUIREMENTS

- Engineering controls.
- Work practice controls.
- Respiratory protection.
- Employers must use engineering and work practice controls first.

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WRITTEN COMPLIANCE PLANS AND COMPETENT PERSON

Employers must prepare a written compliance plan describing how standard will be implemented and indicating that a competent person will make regular and frequent inspections of the job site

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WRITTEN COMPLIANCE PLAN MUST INCLUDE

- **Description of equipment and materials, controls, crew size, job responsibilities, and operations and maintenance procedures for each activity with lead exposure**
- **Description of methods and engineering controls, including supporting engineering plans and studies**
- **Technology considered in meeting the PEL**
- **Air monitoring data documenting sources of lead exposure**

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WRITTEN COMPLIANCE PLAN MUST INCLUDE

- **Implementation schedule for compliance, including schedule for inspections by competent person**
- **Description of work practices (protective work clothing and equipment, hygiene facilities and practices, housekeeping practices)**
- **Clarification of responsibility for informing subcontractors and bystanders of potential exposures**

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PERSONAL MONITORING

Measurement of worker's exposure to airborne contaminant, regardless of respiratory protection.

- Collected outside respirator
- Collected as close to the mouth and nose as practical
- Full shift samples (one sample for each job classification in each work area)
- For multiple shifts, monitor all shifts or shift with highest expected exposure

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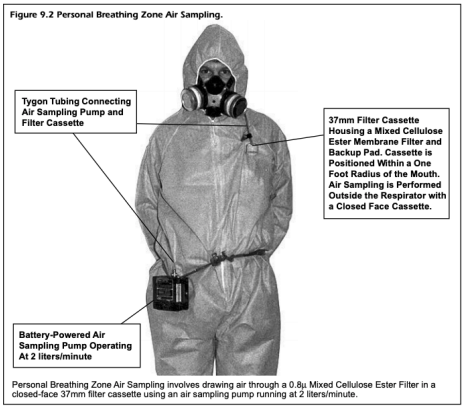
Figure 9.2 Personal Breathing Zone Air Sampling.



Personal Breathing Zone Air Sampling involves drawing air through a 0.8µ Mixed Cellulose Ester Filter in a closed-face 37mm filter cassette using an air sampling pump running at 2 liters/minute.

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Table 9.1 Personal Breathing Zone Air Sampling for Lead by Method or Activity*

Abatement Method/Activity	Personal Breathing Zone Lead Concentrations				
	Number of Samples	Minimum (µg/m³)	Maximum (µg/m³)	Geometric Mean (µg/m³)	Geometric Standard Deviation
Abrasive	28	0.4	399	8.8	7.6
Chemical removal	291	0.4	476	3.3	4.1
Cleaning	138	0.4	588	1.9	3.6
Encapsulation	83	0.4	26	1.4	2.8
Enclosure	50	0.4	72	1.7	3.2
Final cleaning	56	0.9	36	2.1	2.8
Heat gun	360	0.4	916	6.4	4.7
Precleaning	31	0.9	11	1.5	2.2
Replacement	110	0.4	46	2.5	3.9
Setup	153	0.4	137	1.5	3.1
Other[1]	15	0.4	207	1.9	5.1
Missing[2]	87	—	—	—	—

NOTE: Underlined methods resulted in maximum exposures above the OSHA PEL.
OSHA PEL (8-hour, time-weighted average) = 50 µg/m³
* Data collected by HUD Industrial Hygiene Contractors.
[1] Other abatement activities.
[2] Samples with no identified method/activity are not reported.
Laboratory-assigned Limit of Quantitation (LOQ): 0.4 µg/m³

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INITIAL EXPOSURE ASSESSMENT

All employers must conduct initial exposure assessments of all jobs involving lead.

- Purpose is to determine if any workers are exposed to AL of 30 µg/m^3

INITIAL LESS THAN AL

- Monitor again if the conditions of the job change or every 20 dwellings

INITIAL GREATER THAN AL, BUT LESS THAN PEL

- Monitor at least every 6 months, with change in type of work, or every 20 dwellings.
- Continue every 6 months until two consecutive measurements at least one week apart are below AL.

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POSITIVE INITIAL DETERMINATION

- **Assessment shows exposure above AL (30 µg/m^3) for 1 day or more**
- **Must conduct exposure monitoring for each worker or assess with existing data.**

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INITIAL GREATER THAN PEL

- Monitor at least every 3 months, with change in type of work, or every 20 buildings.
- Continue every 3 months until two consecutive measurements at least one week apart are below PEL.

EMPLOYEE NOTIFICATION

- Employees must be given written results of completion of exposure assessment

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PREVIOUS MONITORING RESULTS

- Collected within last 12 months
- Similar processes and types of materials
- Similar work practices
- Similar environmental conditions, including condition of lead-based paint and concentration of lead in paint.
- Similar degree of employee training and supervision.
- Data must be available for IOSH/OSHA compliance officer.

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Table 9.4 Residential Lead Hazard Control Assumed Exposures for OSHA's Task-Related Triggers (adapted from 29 CFR 1926.62)

50 µg/m³ to 500 µg/m³	500 µg/m³ to 2,500 µg/m³	Greater than 2,500 µg/m³
Manual demolition Manual scraping Manual sanding Heat gun use Power tool paint removal in the HEPA vacuum-assist dust collection system	Cleanup on dry, abrasive blasting jobs Abrasive blasting enclosure movement/removal	Abrasive blasting

Note: Abrasive blasting without a HEPA local exhaust system is not permitted in residential dwellings.

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Table 9.3 Required Action Under the OSHA Standard by Exposure Level

CATEGORY I	CATEGORY II	CATEGORY III
30 µg/m³* and under (below the action level)	30–50 µg/m³ (above the action level, but below the PEL).	50 µg/m³ and over (above the PEL).
Train employees. Conduct exposure monitoring. Maintain records.	Same as category I, plus: Provide respirator at employee request. Conduct exposure monitoring every 3 months. Conduct blood lead monitoring.	Same as category II, plus: Enforce respirator use. Enforce use of protective clothing. Develop monitoring every 6 months. Enforce housekeeping. Provide hygiene facilities and enforce washing.

* All exposure levels are 8-hour, time-weighted averages.

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INTERIM WORKER PROTECTION

- For workers performing a task listed as a trigger, can discontinue only after monitoring shows that exposure is below PEL
- Can reduce respiratory protection only after documenting that exposure is below assumed range for the task

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RESPIRATORY PROTECTION PROGRAM

Employer must establish a respiratory protection program whenever respirators are used (voluntary or mandatory)

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SITUATIONS WHEN RESPIRATORS MUST BE USED

- As interim protection for tasks specified in task-related triggers
- Where engineering and work practice controls do not reduce exposure below the PEL (50 µg/m^3)
- Whenever employee requests a respirator

  Employees may wish to use respirators if exposure is below PEL because there are recognized health effects at blood lead levels below those allowed by IOSH/OSHA

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COMPONENTS OF A RESPIRATORY PROTECTION PROGRAM

- Select respirators based on worker exposure
- Establish written standard operating procedures
- Train workers in proper use of respirators
- Fitting, regular cleaning, maintenance, and inspection of respirators
- Store respirators in clean, sanitary location

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RESPIRATOR REQUIREMENTS OF LEAD IN CONSTRUCTION STANDARD

- Employer must provide approved respirator at no cost to employee
- If respirator is required, employer must enforce use
- Select appropriate respiratory based on maximum airborne concentration of lead
- If it will provide sufficient protection, provide a powered air-purifying respirator (PAPR) if requested by employee

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RESPIRATOR REQUIREMENTS OF LEAD IN CONSTRUCTION STANDARD

- Ensure that respirator fits properly and has minimum face piece leakage
- For employees wearing negative pressure respirators, perform qualitative or quantitative fit testing at initial fitting, whenever a different face piece is used, and at least annually
- Provide appropriate medical examination if employee exhibits difficulty during fit testing or subsequent use
- For filter respirators, instruct employee to change filter whenever employee notices increase in breathing resistance

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HIGH EFFICIENCY PARTICULATE AIR (HEPA) FILTER

- HEPA filters are 99.97% efficient in removing all dust particles larger than 0.3 micrometers in diameter
- Type of respirator to wear to filter lead particles
- Should be labeled as N-100, P-100, or R-100 or "protects against lead"

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ORGANIC VAPOR RESPIRATORS

Workers may need organic vapor protection if using chemical strippers or heat guns.

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PROTECTIVE CLOTHING AND EQUIPMENT

- "Take-home" lead exposure
- When is protective clothing and equipment required
- Type of protective clothing required
- Shoe and shoe cover safety
- Heat stress

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TAKE-HOME LEAD EXPOSURE

- Leaded dust is not absorbed through skin
- If worn home, lead on clothes contributes to worker exposure and exposes family to lead

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WHEN IS PROTECTIVE CLOTHING AND EQUIPMENT REQUIRED?

- Employer must provide and enforce use of protective clothing for employees exposed above PEL
- Employer must supply new or clean clothes weekly if exposure is above PEL
- Employer must supply new or clean clothes daily if exposure is above 200 $\mu g/m^3$
- Employer must provide protective clothing at no cost to employee

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TYPE OF PROTECTIVE CLOTHING REQUIRED

- Disposable or reusable coveralls or similar full-body work clothing
- Gloves
- Hardhats
- Safety shoes with nonskid soles
- Disposable shoe covers with nonskid bottoms
- Chemical resistant clothing for skin-contact hazards
- Safety glasses, face shields, and goggles

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HEAT STRESS

Use breathable clothing to reduce risk for heat stress

Train employees to recognize heat stress and its symptoms

- Fatigue
- Dizziness, Nausea and Headache
- Chills, Shivering, Goosebumps
- Vomiting
- Fainting

First Aid For Heat Stress

- Move victim to shade or a cool place
- Give victim fluids if they are able to drink
- Soak with water to cool down
- Seek medical assistance

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HEAT STROKE

- **Person stops sweating**
- **Medical emergency!!!**
- **Cool down quickly and get to hospital**
- **Death or permanent brain damage may result**

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PREVENTION OF HEAT STRESS

- **Avoid working during hottest part of day**
- **Do work requiring the most physical exertion in coolest part of day**
- **Plan exterior work to take full advantage of shade**
- **Wear a hat if outdoors**
- **Take frequent breaks in a cool, shaded area**
- **Drink plenty of liquids**

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ENGINEERING AND WORK PRACTICE CONTROLS

To the extent possible, employers must institute engineering and work practice controls to keep worker exposure at or below the PEL.

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EXAMPLES OF GOOD ENGINEERING CONTROLS

- Use HEPA-filtered local exhaust ventilation for tools
- Use HEPA vacuums for cleanup instead of dry sweeping or compressed air
- Adequate ventilation during heat gun use
- Use wet methods to reduce airborne dust

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EXAMPLES OF GOOD WORK PRACTICES

- Wet scraping, sanding, and sawing
- Provide onsite washing facilities and ensure that workers follow good hygiene practices
- Daily cleanup of work area and equipment
- Avoid methods with high exposure potential

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HOUSEKEEPING

- Employers must keep all surfaces free from lead accumulations
- Must use HEPA vacuum or wet washing for cleanup
- Can use shoveling, wet sweeping, or brushing only if vacuuming proved ineffective
- Mist debris with water before cleanup
- May not use compressed air

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HYGIENE FACILITIES AND PRACTICES

- Required for workers exposed above PEL
- Recommended for other workers exposed to lead

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DECONTAMINATION PROCEDURES

Conduct worker decontamination before all breaks, before lunch, and at end of shift.

- Clean all tools at end of shift
- HEPA vacuum all protective clothing before entering decontamination area
- Enter dirty side of decontamination area
- Remove all protective clothing except respirator
- Roll clothing inward when removing

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CHANGE AREA

- Change areas must have separate storage for protective work clothing and equipment and workers' street clothes
- Employer must ensure that workers do not leave worksite wearing protective clothing
- Clean change areas and clean areas regularly
- If de-con zone is not feasible, workers can wear two layers of protective clothing. Remove first layer at work area exit and second layer in clean area

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SHOWERS

- Employers must provide shower facilities onsite wherever feasible
- Must make soap and towels available
- Must ensure that workers shower before lunch and at end of shift
- If onsite showers not feasible, educate workers about showering before coming in contact with family members

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HANDWASHING FACILITIES

- Must provide hand washing facilities in accordance with general construction health and safety requirements
- Located near worksite
- Equipped with sufficient soap and water to effectively remove lead
- If showers not provided, employers must ensure workers wash hands and face at end of work shift

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EATING FACILITIES

- Employer must provide clean, accessible eating areas for workers
- Do not use work area or dwelling as eating area. Food, beverages, and tobacco must not be present in work area
- Ensure that workers leave work area and wash hands and face prior to eating, drinking, smoking, or applying cosmetics
- Workers may not enter eating areas with contaminated clothing or equipment unless cleaned with HEPA vacuum
- Require workers to wash or shower and change into street clothing if they leave worksite for lunch

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MEDICAL SURVEILLANCE

- Depending on level and duration of airborne exposure to lead, workers must undergo both initial and routine medical surveillance
- All medical examinations must be under supervision of licensed physician, preferably board-certified in occupational health

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INITIAL SURVEILLANCE

- Make available to all employees exposed *on any single day* to lead levels equal to or greater than 30µg/m^3
- Provide to all workers who will perform task-related trigger activities
- Monitor blood lead level (BLL) and zinc protoporphyrin (ZPP). (Zinc protoporphyrin helps measure long-term exposures)
- If initial BLL ≥40 µg/dL, monitor at least every 2 months until 2 consecutive levels < 40 µg/dL

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ROUTINE SURVEILLANCE

- Employer must provide ongoing surveillance (including BLL and ZPP) for all employees who *are or may be* exposed greater than 30μg/m³ more than 30 days in any 12-month period
- Employer must pay for biological monitoring and medical examinations

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BIOLOGICAL MONITORING REQUIREMENTS (cont'd)

- Employer must notify worker of the results in writing within 5 working days after receipt
- Employer must notify employee with BLL ≥ 40 μg/dL that temporary removal will occur at ≥ 50 μg/dL
- Worker cannot be penalized for having high BLL

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REQUIREMENTS FOR MEDICAL EXAMINATIONS

- Initial examination prior to assignment for workers whose exposure will be ≥30 μg/m³ more than 30 days per year
- Annually for employees with BLL ≥ 40 μg/dL any time during last 12 months
- If worker has been medically removed due to EBL
- If worker requests it due to symptoms of lead poisoning

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REQUIREMENTS FOR MEDICAL EXAMINATIONS (cont'd)

- If worker is concerned about having a healthy baby
- If worker has difficulty breathing during respiratory fit test or use
- Furnish worker with written medical opinions from examining physicians
- Provide multiple-physician review if requested by worker at no cost

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EXIT MEDICAL EXAMINATION

- Exit medical examination recommended due to workmen's compensation considerations

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USING MEDICAL SURVEILLANCE INFORMATION

- Determine effectiveness of worker protection program
- Increase of 10 µg/dL or blood leads exceeding 20 µg/dL should trigger efforts to reduce exposure.

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MEDICAL REMOVAL PROTECTION

- Gives worker time away from lead exposure to reduce BLL
- Trigger is BLL ≥ 50 µg/dL or a "final medical determination"

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REQUIREMENTS FOR MEDICAL REMOVAL PROTECTION

- Remove employee when periodic and follow-up BLL both ≥ 50 µg/dL. Employee can return when two consecutive BLL ≤ 40 µg/dL
- Remove employee when final medical determination indicates condition that places employee "at increased risk of material impairment to health" due to lead exposure
- Implement protective recommendations included in final medical determination

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REQUIREMENTS FOR MEDICAL REMOVAL PROTECTION

- Each time employee is removed, provide medical removal protection benefits up to 18 months or as long as job continues.
- Maintain normal salary and benefits, seniority, and right to return to former job.
- Provide same benefits to any worker who is removed, even if removal not required under standard.

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MEDICAL SURVEILLANCE

- Employer must establish and maintain accurate records for each employee in medical surveillance program
- Must keep for duration of employment plus 30 years
- Results of all blood lead testing must be reported to IDPH

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LEAD TRAINING PROGRAM

- Required for all employees exposed to lead at or above Action Level (30 µg/m^3) *on any single day*
- Must be provided prior to time of job assignment and at least annually for all employees

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REQUIREMENTS FOR LEAD TRAINING PROGRAM

- Content of Lead in Construction Standard and its appendices. Must supply a copy of standard and appendices to employee
- Specific nature of operations resulting in lead exposure above AL
- Purpose, proper selection, fitting, use, and limitations of respirators
- Adverse health effects of excessive lead exposure, especially reproductive effects
- Hazards to fetus and precautions for pregnant employees

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REQUIREMENTS FOR LEAD TRAINING PROGRAM

- **Specific engineering controls and work practices**
- **associated with job assignment**
- **Relevant good work practices described in Lead in Construction standard**
- **Content of any compliance plan**
- **Risks associated with chelating agents**
- **Right of access to records**

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ROLE OF THE ABATEMENT WORKER

- Worksite Preparation
- Abatement Strategies
- Interim Controls
- Prohibited Work Methods
- Waste
- Clean Up- Including Clearance Testing
- Soil Controls
- Abatement Documentation & Contractor Responsibilities
- Historic Restoration

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MAJOR RESPONSIBILITIES OF AN ABATEMENT CONTRACTOR

- **Be familiar with and follow federal, state, and local regulations and recommendations**
- **Obtain appropriate certifications and/or work permits**
- **Interpret lead inspection reports and communication options for lead hazard control and/or abatement**
- **Clearly document:**
  - **A. IDPH notification**
  - **B. Occupant protection plan**
  - **C. Methods of abatement used**
  - **D. Clearance testing**
  - **E. Recommended maintenance schedule**
- **Conduct all work in an honest and ethical manner**
- **Meet IOSH/OSHA requirements for employees**

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MOST LIKELY SOURCES OF LIABILITY FOR CONTRACTORS

- **Allowing workers to leave work space without decontaminating**
- **Failure to maintain integrity of containment enclosure**
- **Inadequate work practices and supervision**
- **Worker misconduct (including use of alcohol or drugs on the job).**
- **Failure to stop work if subcontractor not following good work practices**
- **Inadequate cleanup**

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RESIDENT PROTECTION AND WORKSITE PREPARATION

RESIDENT ENTRY INTO THE WORK AREA

Residents must **NEVER** enter work area while work is underway

Depending on the extent of the work, residents may:

- Move out until all of the work is done
- Leave during the day while work is being done and come back to stay in the unit, but outside of the work area, at night
- Stay in the unit, but outside of the work area, while the work is being done

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RESIDENT PROTECTION AND WORKSITE PREPARATION (cont'd)

Area must pass clearance before residents reoccupy work area

Lead-poisoned children should always leave dwelling while work is being done and not return until clearance is passed

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SITE ASSESSMENT AND PRECLEANING

- **Dwelling must be structurally sound**
- **Correct structural deficiencies prior to site preparation**
- **Provide environmental and worker protection if this work disturbs lead-based paint**
- **HEPA vacuum paint chips before laying plastic**

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WHEN TO RELOCATE RESIDENTS DURING THE DAY

- **If bathrooms are not accessible**
- **If work results in hazards such as exposed electrical wires**

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WORKSITE PREPARATION LEVELS: SIGNS

- Post as specified under appropriate Worksite Preparation Level
- Lettering must be at least 2 inches high
- Clearly visible

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WARNING

LEAD WORK AREA

POISON

DO NOT ENTER WORK AREA UNLESS AUTHORIZED

NO SMOKING, EATING OR DRINKING

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WORKSITE PREPARATION LEVELS: PRIMITIVE AIR LOCKS

- Use 2 pieces of plastic larger than doorway
- Tape first sheet on top, floor, and two sides of doorway
- Cut opening 6 feet high down the middle of plastic
- Do not cut down to floor--cut to level workers can easily step through without tripping.
- On work area side of door, tape second sheet of plastic across top of door to act as a flap.

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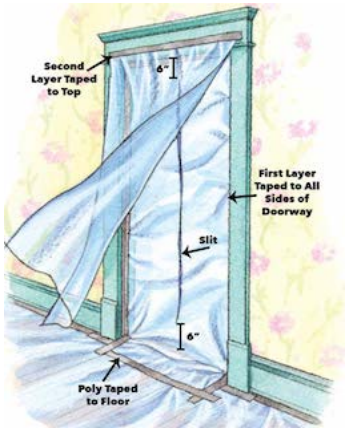

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Level	Scope of Work	Time Limit	Resident Location
1	Dust removal. Disturb less than 2 sq. ft. paint per room.	Must start and complete within one day.	Inside dwelling, but outside work area. Must have access to bathroom, one living area, and entry/exit without going through work area. May leave for the day.
2	Disturb 2-10 sq. ft. paint per room.	Same as Level 1.	Same as Level 1.
3	Disturb 2-10 sq. ft. paint per room.	Must start and complete within 5 working days.	Outside dwelling, but can return in the evening after daily work and cleanup is complete. Must have access to bathroom, one living area,and entry/exit without going through work area. Resident may leave until all work is completed.
4	Disturb more than 10 sq. ft. per room.	No time limit.	Outside dwelling for duration of project. Cannot return until after successful clearance testing.

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Level	Scope of Work	Warning Signs	Containment and Barrier Ssytem
1	Dust removal. Disturb less than 2 sq. ft. paint per room.	At entry to room.	Cover floor with single layer of plastic extending 5 feet beyond work area in all directions. Need low physical barrier to prevent inadvertent access.
2	Disturb 2-10 sq. ft. paint per room.	At entry to room.	Two layers of plastic on entire floor. Plastic sheet with primitive air lock flap on all doorways unless door secured from inside work area.
3	Disturb 2-10 sq. ft. paint per room.	At main and secondary entryways.	Two layers of plastic on entire floor. Plastic sheet with primitive air lock flap on all doorways unless door secured from inside work area. Lock or firmly secure overnight barrier.
4	Disturb more than 10 sq. ft. per room.	At building entrance near main and secondary entryways.	Two layers of plastic on entire floor. If entire unit being treated, cleaned, and cleared, do not need to seal doorways.

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Level	Scope of Work	Ventilation System	Furniture
1	Dust removal. Disturb less than 2 sq. ft. paint per room.	Turn off dwelling ventilation system. Seal vents within 5 feet of work area with plastic.	No covering required for dust removal. Within 5 feet of work area, seal with plastic or move. More than 5 feet from work area, drape with plastic.
2	Disturb 2-10 sq. ft. paint per room.	Turn off dwelling ventilation system. Seal all vents in room with plastic.	Remove from work area. Seal with single layer of plastic if too large to move.
3	Disturb 2-10 sq. ft. paint per room.	Same as Level 2.	Same as Level 2.
4	Disturb more than 10 sq. ft. per room.	Same as Level 2.	Same as Level 3.

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Level	Scope of Work	Time Limit Per Dwelling	Resident Location
1	Disturb less than 10 sq. ft. of exterior paint. Soil work.	One day.	Inside dwelling, but outside work area. Must have access to entry/exit without going through work area. May leave for the day.
2	Disturbs 10-50 sq. ft. of exterior paint. Soil work.	No Time limit	Outside the dwelling during the day
3	Disturbs more than 50 sq. ft. of exterior paint & Soil Work	No time limit.	Outside dwelling for duration of project. Cannot return until after successful clearance testing.

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EXTERIOR CONTAINMENT: ESTABLISH THE WORK AREA

Cover the ground with protective sheeting

- If space permits, extend a minimum of 10 feet from the work area.
- Play special attention and cover nearby vegetable gardens and children's play areas.

Limit access, place signs

- Establish a 20 foot perimeter around the work area if space permits.

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EXTERIOR CONTAINMENT: CLOSE WINDOWS & DOORS

- **Close all nearby doors and windows that are within 20 feet of the work area**

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EXTERIOR CONTAINMENT: GARDENS, PLAYGROUND EQUIPMENT, TOYS & SANDBOX

- **Cover exterior gardens and plantings with plastic**
- **Move play equipment 20 feet away from working area**
- **If items cannot be moved, seal with taped plastic sheeting**

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INTERIOR CONTAINMENT: REMOVE OR COVER BELONGINGS

- **Remove belongings**
- **Cover immovable objects in protective sheeting, including:**
  - **Furniture**
  - **Carpet**
  - **Lamps and other fixtures**

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INTERIOR CONTAINMENT: COVER FLOORS

Required:

- Cover all work area floors with plastic sheeting
- Cover floors a minimum of 6 feet in all directions around the paint being disturbed.

6' 6'

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INTERIOR CONTAINMENT: CLOSE WINDOWS, DOORS, HVAC

Depending on what work is to be done:

- Close all windows in the work area
- Close and seal all doors in the work area
- Close and seal all HVAC vents in the work area

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LEAD HAZARD ABATEMENT

Any measure or set of measures designed to

PERMANENTLY eliminate

lead-based paint hazards

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TWO KINDS OF ABATEMENT

1. Abatement of lead hazards

   Permanent measures that eliminate exposure **only** to those surfaces that are considered lead hazards.

2. Total abatement of lead-based paint

   Measures that eliminate exposure to **ALL** lead-based paint in a dwelling regardless of it's condition or location.

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ABATEMENT HAS TWO PRINCIPAL ADVANTAGES

1. Provides a long term solution (expected to last at least 20 years)
2. Little (if any) monitoring or reevaluation is needed

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ABATEMENT STRATEGIES

- Replacement of building components that contain lead-based paint
- Enclosure of lead-based paint
- Removal of lead-based paint
- Encapsulation of lead-based paint
- Removal of lead contaminated dust
- Removal or covering of lead contaminated soil
- Enclosure and building component replacement are least hazardous abatement methods
- Paint removal is most hazardous abatement method

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BUILDING COMPONENT REPLACEMENT

Removal of doors, windows, trims, and other building items that contain lead-based paint and replacing them with lead-free components

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ADVANTAGES AND DISADVANTAGES OF BUILDING COMPONENT REPLACEMENT

1. Most permanent solution
2. Easy to integrate with general housing rehab
3. Increased energy efficiency
4. May not be permitted in historic preservation

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ENCLOSURE

Installation of rigid, durable barrier that is mechanically attached to building components, with all edges and seams sealed with caulk or other sealant

- Use standard construction methods
- Difference between enclosure and ordinary construction is careful sealing of all edges, joints, and seams to create a dust-tight enclosure
- Generates little waste
- Less labor needed than for building component replacement
- Less hazardous than building component replacement

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LABELING OF ENCLOSED SURFACES

1. **Label surface to be enclosed every two square feet with:**

   "Danger: Lead-Based Paint" in permanent ink

2. **Prepare drawing of the property floor plan that includes the enclosures.**
3. **Make drawing easily accessible to maintenance personnel.**

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PAINT REMOVAL

- **Most hazardous method of abatement**
- **May be best method for limited areas and for historic preservation**

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ENCAPSULATION

Process that makes lead-based paint inaccessible by providing a barrier between lead-based paint and environment

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ENCAPSULATION BARRIER

- Liquid-applied coating, with or without reinforcement materials
- Material bonds adhesively to component surface
- May be attached with mechanical fasteners, but primary means of attachment is by bonding to surface
- Must have successful bond between surface of existing paint film and encapsulant
- ALL layers of existing paint must adhere well to each other AND to substrate

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DIFFERENCE BETWEEN ENCLOSURE AND ENCAPSULATION

- Enclosure attaches to surface with mechanical fasteners
- Encapsulation relies on bond between encapsulant product and surface

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UNSUITABLE SURFACES

- Accessible, friction, and impact surfaces
- Deteriorated components
- Deteriorated paint films
- Components affected by moisture problems
- Surfaces with known incompatibility between existing coating layers

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PATCH TEST

- Prepare a small area of existing lead-based paint film
- Apply encapsulant product and cure in recommended manner
- Does it stick?

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RECORDKEEPING FOR ANY ABATEMENT WORK

- The location of enclosed or encapsulated lead based paint
- Absence of lead based paint

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COMBINATION OF CONTROLS

Most effective method of making unit "lead-safe" is often a combination of interim controls and abatement

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DEFINITION OF INTERIM CONTROLS

A set of measures designed to temporarily reduce human exposure or likely exposure to lead-based paint hazards, including:

- Specialized cleaning
- Repairs, maintenance, and painting
- Temporary containment
- On-going monitoring of lead-based paint hazards or potential hazards
- Establishment and operation of management and resident education programs

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WHEN ARE INTERIM CONTROLS APPROPRIATE?

- Allowed by regulation
- Most surfaces are intact and structurally sound
- Lead exposure comes primarily from deteriorating paint and excessive levels of lead in dust or soil
- If housing is slated for demolition or extensive rehab within a few years

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WHEN ARE INTERIM CONTROLS NOT APPROPRIATE?

- Substantial structural defects
- Major components are seriously deteriorated or subject to moisture
- Abatement is required by regulations

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INTERIM CONTROLS INCLUDE

- Repairing all rotted or defective substrates
- Paint film stabilization
- Treating chewable, friction, and impact surfaces
- Treating bare soil with excessive levels of lead
- Dust removal and control
- Educating residents and workers regarding lead poisoning
- Reevaluation and maintenance

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METHODS OF INTERIM CONTROLS

- Paint film stabilization
- Treatment of accessible, impact, and friction surfaces
- Dust removal and control
- Soil interim controls

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STABILIZE PAINT FILM ONLY AFTER COMPLETING REPAIRS

- Damaged or missing roof flashing.
- Damaged or missing door and window flashings.
- Siding in contact with soil.
- Missing glass window.
- Missing, damaged, or deteriorated caulking.

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REPAIR SUBSTRATE BEFORE STABILIZING PAINT FILM

- **Dry rotted or rusty structural, siding, or railing components**
- **Wall/ceiling plaster that is loose from underlying lath**
- **Missing hardware (e.g. door hinges, knobs)**
- **Loose siding and trim**
- **Loose wallpaper**

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PAINT REMOVAL METHODS

- **Remove ALL loose surface material with wet scraping or sanding**
- **Clean to remove contaminants that prevent adhesion**
- **Enhance adhesion by:**
  - Chemical etching
  - Applying rust inhibitors
  - Spot sealing
  - Wet sanding

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PROHIBITED PAINT REMOVAL METHODS

- **Open flame burning or torching**
- **Dry scraping or sanding (except for limited areas)**
- **Machine sanding or grinding without HEPA exhaust tool**
- **Uncontained hydro blasting or high-pressure wash**
- **Abrasive blasting or sandblasting without HEPA exhaust tool**
- **Heat guns operating above 1,100° F**

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UNCONTAINED HYDROBLASTING OR HIGH PRESSURE WASHING

- Almost impossible to contain all water and paint chips
- Puts water into substrate that will cause paint to peel

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DRY SCRAPING

- PROHIBITED because large amount of dust is generated. Makes cleanup and clearance very difficult.
- Allowed only near electrical outlets or with heat gun

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CHEMICAL STRIPPERS CONTAINING METHYLENE CHLORIDE

- Widely available, but not recommended
- Methylene chloride can cause liver and kidney damage, carbon monoxide poisoning, and is suspected to cause cancer
- Air-purifying respirators do not provide adequate protection

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RECOMMENDED PAINT REMOVAL METHODS

- Heat guns
- HEPA mechanical removal
- Chemical removal
- Wet sanding or wet scraping

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HEAT GUNS

- Operate heat guns below 1,100 ºF
- Be careful around flammable materials
- OSHA requires fully charged ABC-type 20 pound fire extinguisher within 100 feet of work area
- Stay 3 - 6 inches away from painted surface

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HEPA MECHANICAL REMOVAL METHODS

- HEPA sanding
- HEPA vacuum blasting
- HEPA needle gun

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HEPA SANDING

- Traditional sanding equipment with shroud or containment system placed under partial vacuum
- Exhaust passes through HEPA filter (often using HEPA vacuum) to reduce airborne lead
- Very effective for surface preparation prior to repainting. (Does not work well on detailed moldings)
- Recommended anytime sanding is done

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CHEMICAL REMOVAL METHODS

- May produce less lead dust than other methods, if done properly
- Can be very costly
- Potential worker injury from chemical burns and spills/splashes
- Need proper ventilation
- May need paper or cardboard on floors in addition to plastic

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WET SANDING AND SCRAPING

- Appropriate anywhere except around electrical outlets
- Mist surface before sanding or scraping
- Used to remove deteriorated paint
- Probably can't remove enough paint to qualify as "abatement"
- Consider using two people: one to keep surface wet and a second one to scrape

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WASTE MANAGEMENT

Two Types of Waste:

- **Hazardous**

  In Iowa, hazardous waste regulated by EPA Region VII.

- **Non-Hazardous solid waste**

  In Iowa Solid waste regulated by Iowa Department of Natural Resources.

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IOWA REGULATIONS FOR LEAD WASTE FROM RESIDENTIAL LEAD HAZARD CONTROL

- Paint Chips
- Soil
- Building Components
- Waste Water

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TOXICITY CHARACTERISTIC LEACHING PROCEDURE (TCLP)

- Simulates acid leaching conditions in a sanitary landfill. Waste is exposed to a weak acid solution for 18 hours. Solution is then analyzed to determine "leachable lead"
- "Leachable lead" is amount of lead that has leached out of waste into acid solution.
- If leachable lead $\geq$ 5 ppm (mg/L), waste is hazardous

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HOUSEHOLD HAZARDOUS WASTE OVERVIEW OF IOWA REQUIREMENTS

- Resource Conservation and Recovery Act (RCRA) governs hazardous waste management from generation to disposal
- Residential lead waste (paint chips, components, soil) is not considered hazardous
- Iowa does not have a state run RCRA program. EPA runs the program in Iowa

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PAINT CHIPS

- Exempted from hazardous waste regulations under the RCRA household waste exclusion (1995 EPA Interpretation)
- Contractor must document that waste came from households rather than commercial buildings or superstructures
- Do not accumulate waste -- dispose as you go
- Work with landfill in advance -- Stress that waste comes from households

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BUILDING COMPONENTS

- As of August 2000, components painted with lead-based paint are no longer subject to RCRA. They are considered household hazardous waste.
- In Iowa, these components may be disposed of at a solid waste landfill or at a construction and demolition landfill (Other states' regulations may be different)

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WASTE WATER

- Contact the local waste water treatment facility to see if special treatment is needed
- Pour wastewater down toilet after any required pretreatment
- NEVER dispose of waste water by pouring onto ground or pavement

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LEAD WASTE MANAGEMENT AND CONTAMINATION CONTROLS

- Large debris – wrap poly film and seal with tape
- Small debris -- place in poly bag and gooseneck seal with tape
- Change HEPA vacuum bags / filters in controlled areas
- Collect wash water for filtering if required
- Do not leave waste in dwelling unit or on the job.
- Do not mix hazardous waste with non-hazardous waste.
- Bag and seal or decontaminate tools.
- Do not handle packaged items roughly.

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CLEANING AND CLEARANCE

- Remove containment
- Clean thoroughly
- Clearance testing is required if specs refer to HUD guidelines

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REMOVING LEADED DUST FROM A DWELLING

- Need to remove both large, visible particles and small, invisible particles
- Clean horizontal surfaces with HEPA vacuum followed by wet wash

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CREATING CLEANABLE SURFACES

- Floors with smooth, intact surfaces can be effectively cleaned
- Repair floors in poor condition before cleaning
- Machine wash small rugs and mats
- Large rugs or carpeting in fair to good condition can be cleaned
- Consider discarding rugs, carpets, and mats at the end of useful life

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IS DUST REMOVAL ALONE ADEQUATE?

- Yes, if surfaces are cleanable and there is no deteriorated lead-based paint present
- No, if substrates are too deteriorated to clean or if there is deteriorated lead-based paint present

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DAILY CLEANING PROCEDURES: MAINTAINING CONTAINMENT

- Monitor plastic sheeting throughout day
- Immediately repair damage with plastic and tape

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FINAL CLEANING PROCEDURES

Wait at least one hour after finishing work to allow dust to settle

1. Mist and sweep floor plastic.
2. Mist and clean plastic on cabinets and counters.
3. Remove by folding from corners/ends to middle to trap dust.
4. Remove all layers of plastic from the floor in the same manner.
5. Place all plastic in bags and seal.

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FINAL CLEANING PROCEDURES (cont'd)

6. Move plastic bags to on-site storage area.
7. Clean from ceiling to floor with HEPA vacuum, wet wash, and HEPA vacuum.
8. Containment plastic must remain until after cleaning.
9. Conduct preliminary visual examination.
10. Paint and seal all treated surfaces.

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HIGH-EFFICIENCY PARTICULATE AIR (HEPA) VACUUMS

- Capable of picking up extremely small particles.
- Do not exhaust small particles back into the room.
- HEPA VACUUM ALL ROOMS UNLESS:
  - Room had no lead hazards and was properly separated from work areas before work began.
  - Room was not entered during work.

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HEPA VACUUMING PROCEDURES

- Begin on ceilings and end on the floors
- Do not pass through rooms already cleaned
- Clean dwellings' entryway last

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CURRENT IDPH AND EPA RECOMMENDATION ON CHOICE OF DETERGENT

- Use any available detergent according to manufacturer's directions
- Put plenty of physical effort in cleaning

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HOW CLEAN IS CLEAN ENOUGH?

- Surface cannot be too clean
- Try to pass "white glove" test
- Better to clean more than needed than to fail clearance test

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HEPA / WET WASH / HEPA CYCLE

- HEPA vac to remove as much dust and debris as possible
- West wash to further dislodge dust from surfaces
- HEPA vac after drying to remove remaining particles

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FINAL CLEANING: DECONTAMINATION OF WORKERS, SUPPLIES, AND EQUIPMENT

- Clean clothing, shoes, and tools or place in sealed plastic bag before putting in a worker's vehicle
- Wipe down all equipment with detergent solutions
- Replace mop heads, rags, sponges, etc., after each job

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PRELIMINARY VISUAL EXAMINATION BY CERTIFIED CONTRACTOR

- Done after final cleaning
- Visually evaluate the entire work area to ensure that all interim control and abatement work is complete
- Ensure that there is no visible dust or debris ("white glove" test)

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SURFACE PAINTING/SEALING

- Prime and repaint walls, ceilings, and woodwork.
- Coat floors with appropriate sealant or cover with vinyl, etc., before clearance testing.

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CLEARANCE INSPECTION

Done at least one hour after final cleaning for the following reasons:

1. To ensure interim control or abatement work is complete
2. To detect presence of excessive lead dust
3. To ensure all treated surfaces are sealed

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INITIAL CLEARANCE TEST FAILURE RATES

Likelihood of passing dust-clearance tests depends on :

1. Chosen intervention strategy.
2. Methods of interim controls or abatement.
3. Care exercised by the contractor.

Failure rates are higher for chemical stripping and hand-scraping than for replacement and encapsulation/enclosure.

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INTERPRETATION OF DUST LEAD LEVELS

For single surface samples the clearance levels or level at which samples fail are:

Uncarpeted floors - ≥ 40 µg/ft^2

Carpeted floors - ≥ 40 µg/ft^2

Interior window sills - ≥ 250 µg/ft^2

Window wells (troughs) - ≥ 400 µg/ft^2

≥ means greater than or equal to

For composite samples, the above standards must be divided by half the number of subsamples in the composite sample before the lab results are interpreted.

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CLEARANCE STANDARDS

- Not possible to remove ALL lead dust from a dwelling. However, it is possible to lower dust lead level to safe level
- Clearance levels are safety measures to insure that lead dust is not a greater hazard after work is complete
- Cleaned areas cannot be occupied until clearance standards are met

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WHO CAN DO CLEARANCE INSPECTIONS?

- For clearance after abatement, must be a certified inspector/risk assessor.
- For clearance after interim controls, paint stabilization, standard treatments, or rehabilitation pursuant to HUD regulations, must be a certified visual risk assessor (Iowa regulations).

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WHEN IS CLEARANCE TESTING REQUIRED?

- Required by law for all abatement projects.
- For HUD-assisted housing, if a maintenance or hazard reduction activity disturbs painted surfaces that total more than:
  1. 20 square feet on exterior surfaces.
  2. 2 square feet in any one interior room or space.
  3. 10 percent of the total surface area on any interior or exterior type of component with a smal surface area (window sills, baseboards, and trim.)

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TWO PHASES OF CLEARANCE TESTING

1. Visual examination
2. Environmental dust sampling

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VISUAL EXAMINATION

Visual examination is done before environmental sampling to determine if work was done properly.

- **Paint Removal and Repainting**
  - Examine all surfaces where paint has been removed before repainting to ensure paint was really removed.
  - Examine bare surfaces to ensure there is no visible residue
- **Soil Treatments**
  - If soil covering is chosen method, verify that all bare soil areas are covered

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VISUAL EXAMINATION

Interim Controls

- Confirm that all lead-based paint is stabilized (No deteriorated paint in a cleared dwelling)
- Chewable, impact, and friction surfaces marked for treatment have been treated

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VISUAL EXAMINATION

Settled Dust and Debris

- No evidence of settled dust following cleanup
- Contractor must remove settled dust before clearance sampling
- "White glove test" may be a good indicator for contractors
- Ensure that all waste and debris have been removed
- Ensure that lead dust and paint chips did not get outside dwelling
- Check for paint chips in bare soil

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ADDITIONAL CLEANING TO MEET CLEARANCE

- Focus on areas where first round of cleaning was inadequate. Once a component has passed it's passed and no further cleaning is required
- If a component in a room fails, re-clean only that component in the affected rooms (i.e. floors)
- Unless containment is used, rooms untested during the first round of sampling are considered to be "represented by" a failed sample

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ABATEMENT AND INTERIM CONTROLS FOR LEAD-CONTAMINATED SOIL

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ACCEPTABLE LEVELS OF LEAD IN BARE RESIDENTIAL SOIL

- **What is "bare" soil?**

  Soil where a child could have substantial soil contact while playing.

  Good vegetation cover (grass, bushes, etc.) is not "bare" soil.

- **Residential areas - 400 ppm.**
- **Non-residential areas – 1,200 ppm.**

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ABATEMENT OF LEAD-CONTAMINATED SOIL

Use when lead in soil exceeds 5,000 ppm

METHODS OF SOIL ABATEMENT

- **Soil removal and replacement**
- **Soil cultivation**
- **Soil treatment and replacement**
- **Permanent covering**

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SOIL REMOVAL: LEAST PREFERRED METHOD

- **Cost of hauling large quantities of soil**
- **May be difficult to local disposal sites for soil**
- **Reduces need for uncontaminated replacement soil**

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PERMANENT COVERING

- **Cover soil in high-traffic areas with high-quality concrete or asphalt**
- **Not necessary to remove the contaminated soil**

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INTERIM CONTROLS FOR LEAD-CONTAMINATED SOIL

- Interim control methods for soil
- Controls to minimize migration of soil into dwellings
- Monitoring and reevaluating soil interim controls

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IDPH RULES FOR ABATEMENT

- IDPH notification
- Written occupant protection plan
- Contractor availability
- Workers
- Written abatement report
- Recordkeeping

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IDPH NOTIFICATION

Certified contractors must notify IDPH in writing at least seven (7) days prior to beginning lead abatement in residential dwelling or child-occupied facility.

IDPH NOTIFICATION MUST CONTAIN:

- Dates work will be done.
- Name, address, telephone number, and contact person for contractor.
- Contractor's Iowa certification number.
- Address (including apartment number) to be abated.
- Name, address, and telephone number of property owner.
- Is the dwelling owner occupied or rental?
- If occupied rental: names of occupants.
- Approximate year dwelling built.
- Brief description of work to be done.

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WHERE TO SEND NOTICE

Lead Poisoning Prevention Program
Iowa Department of Public Health
321 East 12th Street
Lucas State Office Building
Des Moines Iowa 50319

Fax: 515-281-4529

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REVISED NOTIFICATIONS

- **If information in the notification changes a revised notification must be issued by the contractor**

Example:

If the ending date changes then a revised notification must be issued.

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CONTRACTOR AVAILABILITY

- **Contractor must be on site during all worksite preparation and during post-abatement cleanup**
- **At all other times, must be onsite or able to be contacted by phone, pager, or answering service and onsite in two hours or less**

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WORKERS

- **As of March 1, 2000, must utilize certified abatement workers to conduct lead abatement**
- **Any subcontractors (ex., painting and cleaning) must be certified lead abatement workers**

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WRITTEN OCCUPANT PROTECTION PLAN

- **Required by state law for abatement projects**
- **Must be developed prior to abatement**
- **Must describe measures and management procedures taken to protect occupants from exposure to lead-based paint hazards**
- **Must be unique for each dwelling or child-occupied facility**

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WRITTEN ABATEMENT REPORT

- Required by state law for abatement projects
- Detailed written description of abatement
- Clearance testing information
- Must give copy to property owner

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CLEARANCE TESTING INFORMATION

- Date of clearance testing
- Name, address, and signature of certified inspector conducting clearance testing
- Results of clearance testing
- Results of all soil analyses
- Name of lab conducting analyses of dust and soil samples

CLEARANCE REPORT

- Inspectors/ Risk Assessors must provide the contractor with the clearance information for the clearance report within 3 weeks.

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ABATEMENT REPORT

- The final abatement report must be completed within 30 days after clearance is passed.

RECORDKEEPING

- Must keep all required reports for at least three years

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NATIONAL HISTORIC PRESERVATION ACT OF 1966

- Federal agencies must consider effects of their undertakings on historic properties
- Must afford Advisory Council on Historic Preservation (ACHP) opportunity for comment
- Applies to properties where federal funds will be used

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STANDARDS FOR THE TREATMENT OF HISTORIC PROPERTIES (Secretary of the Interior, revised 1992)

1. Identify significant spaces, finishes, and features
2. Set priorities for preservation
3. Applies to exteriors and period interiors
4. Examples: decorative frescoes, polychrome woodwork, historic painted finishes encased under modern paints

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HOMES WHERE CONFLICTS MAY EXIST BETWEEN AND STANDARDS FOR TREATMENT OF HISTORIC PROPERTIES

- Homes on the National Register
- Homes eligible for listing on the National Register (over 50 years old with many original materials and features)
- Historically significant buildings
- Exhibit high degree of craftsmanship

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PROPERTY EVALUATION

- Appropriate agency must identify architectural significance of dwelling prior to work that may affect historic resource
- National (or State) Register of Historic Places Nomination Form may contain this information

"APPROPRIATE AGENCY"

- Local Historic Preservation Commission
- Ralph Christian - State Historical Society - 515/242-6152

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REQUIREMENTS VS. RECOMMENDATIONS

- Local commission may require design review before renovation or abatement. May have authority to approve/disapprove plans
- Owner must follow federal guidelines from Secretary of the Interior if federal grant funds are used or if claiming a tax credit
- In other cases, these procedures are recommended, not required

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LEAD SAFE RENOVATOR/ RRP RULE

This section emphasizes Iowa regulations for lead-safe renovators

- **Addresses activities that disturb lead-based paint in target housing and child-occupied facilities**
- **It requires:**
  - Training providers must be approved.
  - Renovators must be trained and supervised.
  - Renovators and firms must be certified.
  - Lead-safe work practices must be used during renovations.
- **Effective on April 22, 2010**
- **EPA may authorize states, territories and tribes to enforce this rule. Iowa is an authorized state.**

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THE LEAD SAFE RENOVATOR RULE: EXCLUSIONS

- **Renovation activities where affected components do not contain lead-based paint**
- **Emergency renovations (still requires cleanup and cleaning verification or dust lead clearance)**
- **Minor repair and maintenance activities.**

  Note: This exclusion does not apply to window replacement, demolition, or activities involving prohibited practices
- **Renovations performed by homeowners in homes that they own and where they or immediate relatives live**

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Definitions:

Iowa Administrative Code 641- Chapter 70.2-(135)- Definitions:

New Definition of "Minor Repair and Maintenance"

Implementation date of 1-16-2013

"Minor repair and maintenance activities" means activities, including minor heating, ventilation or air-conditioning work, electrical work, and plumbing, that disrupt less than the minimum areas of a painted surface established in this definition where none of the work practices prohibited or restricted by this chapter are used and where the work does not involve window replacement or demolition of painted surface areas. When painted components or portions of painted components are removed, the entire surface area removed is the amount of painted surface disturbed. Projects, other than emergency renovation, performed in the same room within the same 30 days must be considered the same project for the purpose of determining whether the project is a minor repair and maintenance activity. Renovations performed in response to an elevated blood lead (EBL) inspection are not considered minor repair and maintenance activities. The minimum area for minor repair and maintenance activities is:

1. Less than 1.0 square foot of an interior painted or finished wood surface per renovation;

2. Less than 6.0 square feet of a painted or finished drywall or plaster surface per room; or

3. Less than 20.0 square feet of an exterior painted or finished surface per renovation.

Projects performed pursuant to (HUD) 24 CFR Part 35 shall comply with the de minimis levels in 24 CFR 35.1350 if these de minimis levels are more restrictive than the minimum areas of a painted surface established in this definition.

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EMERGENCY RENOVATION

***"Emergency renovation"* means renovation, remodeling, or repainting activities necessitated by:**

- Non-routine failures of equipment or of a structure that were not planned but resulted from a sudden, unexpected event that if not immediately attended to:

- Presents a safety or public health hazard or threatens equipment or property with significant damage
- "Emergency renovation" includes interim controls, renovation, remodeling, or repainting activities that are conducted in response to an elevated blood lead (EBL) inspection

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THE LEAD SAFE RENOVATOR RULE RULE: FIRM RESPONSIBILITIES

- Ensure overall compliance with the RRP Rule
- Ensure that all renovation personnel are certified lead-safe renovators or have been trained on-the-job by a certified lead-safe renovator
- Assign a certified lead-safe renovator to each job
- Meet pre-renovation education requirements
- Meet recordkeeping requirements.

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INDIVIDUAL CERTIFIED LEAD-SAFE RENOVATOR RESPONSIBILITIES

- Perform work and direct lead-safe work practices
- Provide on-the-job training to non-certified workers
- Keep a copy of the initial and/or refresher training certificates onsite
- Use EPA-recognized test kits to identify lead-based paint
- The certified lead-safe renovator **MUST** be on site during all **preparation work** and **clean up activities**.

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INDIVIDUAL CERTIFIED LEAD-SAFE RENOVATOR RESPONSIBILITIES (cont'd)

- At all other times during renovation, the certified lead-safe renovator must be available by telephone, pager, or answering service and be able to be onsite within 2 hours
- Maintain the containment to keep dust and debris within the work area
- Implement the cleaning verification procedure
- Prepare and maintain required records

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HUD'S LEAD SAFE HOUSING RULE

- Covers federally-owned or assisted target housing and federally-owned target housing being sold (ex., HUD foreclosure)
- Certified lead-safe renovators should ask the owner to find out if the property receives federal assistance
- HUD's rule has evaluation and control requirements based on type of assistance:
  - Visual assessment or lead paint inspection
  - Paint stabilization, interim controls, or abatement
  - Ongoing evaluation and lead-based paint maintenance

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HUD'S LEAD SAFE HOUSING RULE: SAFE WORK PRACTICES

- **HUD's rule requires lead safe work practices for:**
  - Paint stabilization
  - Interim control of identified lead-based paint hazards
  - Rehabilitation (renovation)
  - Standard treatments
  - Ongoing lead-based paint maintenance

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HUD'S LEAD SAFE HOUSING RULE ADDRESSES

- **Training (usually classroom training for workers).**
- **Occupant protection and worksite preparation.**
- **EPA-recognized test kits may not be used.**
- **Dust clearance testing must be done. Post-renovation cleaning verification is not allowed.**
- **Occupant notification after work (within 15 days)**

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VISUAL INSPECTION PROCEDURE

Conducted by Certified Lead-Safe Renovator

- Put on disposable foot covers before entering the work area
- Make sure there is adequate lighting in the work area
- Systematically look for dust and debris on every horizontal surface in the work area and 2 feet beyond
  - Work from the farthest area from the entry to the entry
  - Closely examine each surface

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VISUAL INSPECTION PROCEDURE (cont'd)

- If you find visible dust or debris, then re-clean the work area.
- Once you have carefully looked at all of the surfaces and found no dust or debris, proceed to the cleaning verification procedure or clearance

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POST-RENOVATION CLEANING VERIFICATION (CV)

Procedure for Windows:

- Certified lead-safe renovator MUST perform verification testing.
- Wipe each window sill and window trough within the work area.
- Use a single wet disposable cleaning cloth per window sill.
- Use a single wet disposable cleaning cloth per window trough.

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POST-RENOVATION CLEANING VERIFICATION (CV)

Procedure for Windows (cont'd):

- Compare each cloth to the verification card.
- If the cloth is lighter than the verification card the area has been adequately cleaned.
- If it does not match or is darker than the verification card then reclean the area. Then re-wipe the area with a new cloth and compare this second wipe to the verification card.
- If it fails again, re-clean the surface again and wait 1 hour or until surface is completely dry and repeat verification this time using a dry disposable cleaning cloth. This completes the cleaning verification.

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POST-RENOVATION CLEANING VERIFICATION

Procedure for Floors and Counter Tops

- Wipe uncarpeted floors and all countertops with wet disposable cleaning cloths just like the windows-
- Floors must be wiped using an application device with a long handle and a head to which the cloth is attached.
- Wipe up to a maximum of 40 ft^2 per cloth.
- Compare each wipe to the CV card just like the window verfication process until a clean wipe is achieved.

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POST-RENOVATION CLEANING VERIFICATION (CV)

Exterior Verification

- **Certified lead-safe renovator MUST perform visual inspections**
- **Certified lead-safe renovator MUST ensure there is no dust, debris, or residue on windowsills or on the ground**
- **If there is visible debris it must be eliminated and another visual exam must be performed**
- **When exterior passes visual exam it is considered adequately cleaned**

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LEAD SAFE RENOVATOR: ON THE JOB TRAINING

Certified Renovators are responsible for teaching lead-safe work practices to non-certified renovation workers.

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ROLE OF THE TRAINED, NON-CERTIFIED RENOVATION WORKERS

- **They must perform lead-safe work practices as described in the RRP rule**
- **Protect the home by "setting up" the work area under the supervision of a certified lead-safe renovator**
- **Protect themselves**
- **Perform renovation work safely**
- **Do not use prohibited practices**
- **Control dust and debris**
- **Clean the work area under the supervision of a certified lead-safe renovator**
- **Non-certified workers are not allowed to perform verification card testing**

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TRAINING DOCUMENTATION

The Certified Renovator assigned to the job must maintain at the job site the following records for on-the-job training :

- **Written certification of worker training:**
  - **Must show which workers have what training**
  - **Must be signed by the Certified Renovator who did the training**
- **All training documentation must be kept for 3 years following completion of the renovation**

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LEAD SAFE RENOVATOR RECORD KEEPING

1. **Certification Documentation**
2. **Test Kit Report**
3. **Pre-renovation Notification Forms**
4. **Non- Certified Worker On-the-Job Training report**
5. **Final Report Including Verification/Clearance Testing**

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RECORDS

- Copies of your firm and lead renovator licenses (must be kept on site) then kept for up to 3 years.
- Non-certified worker training documentation (must be kept on site) and then kept for up to 3 years.
- Lead-based paint testing results and written report when an EPA-recognized test kit is used. Must be kept for up to 3 years.

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RECORDS (cont'd)

- Proof of owner/occupant pre-renovation education must be kept for up to 3 years.
- Final report with post-renovation cleaning verification card or clearance testing report.
  - Must be delivered to the owner with the final invoice or within 30 days.
  - Must be kept for up to 3 years.

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MAINTAINING YOUR CERTIFICATION

- Firm Certification is valid for 3 years. To maintain, you must renew every three years by submitting renewal form to IDPH
- Individual Certification is valid for 3 years. To maintain, you must renew every 3 by taking your refresher training course and submitting renewal form and certification fee of $180.00 to IDPH.
- Renewal reminders will be emailed to you by the Department of Public Health 60 days before your license is set to expire.
- Renewal reminders will be sent you via regular mail from Iowa Lead Safety during that same time period.
- Refresher course is required within 3 years from your license expiration date

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REFERENCES

Information, statistics, work practices and guidelines contained in this manual were obtained from the following agencies, resources and related publications.

- Iowa Department of Public Health
- OSHA (Occupational Safety Health Administration)
- US Census
- EPA (Environmental Protection Agency)
- HUD (Housing & Urban Development)

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