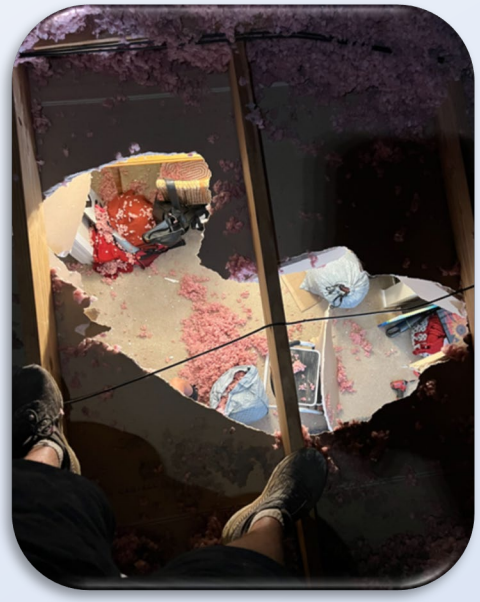
Health/Safety During Soil Gas Mitigation

(with Asbestos/LBP Overview)



Presenters: Myca Bruno, Katie Hubicki, and Victoria Cardona

Section 11.0 (Health and Safety) of the ANSI/AARST *Soil Gas Mitigation Standards for Existing Homes* (SGM-SF 2023)

- Hazardous Building Conditions
  - Asbestos
  - Lead-Based Paint
  - Other
- Safety Management Program
- Safety Training
- PPE

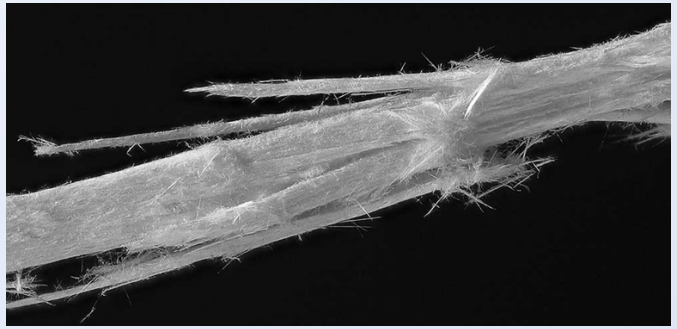
By knowing where potential hazards are likely to be located and then taking appropriate measures, you can better protect yourself and others from exposure.

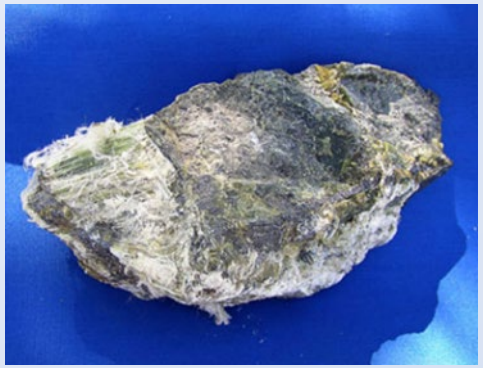
The purpose of conducting mitigation is to resolve an environmental exposure issue.

Without proper awareness/ knowledge, you may be at risk of causing additional environmental exposure issues from different sources in the built environment, causing health hazards for the tenant, as well as yourself.

= POTENTIAL OF LIABILITY

ASBESTOS





What is asbestos?

A group of naturally occurring fibrous minerals that are resistant to heat and corrosion

Includes six types of minerals: chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite

Asbestos fibers are:

- Virtually indestructible
- Resistant to chemicals and heat
- Very stable in the environment
- Do not evaporate into air or dissolve in water
- Not broken down over time
- Excellent insulator

ASBESTOS

Why was asbestos used in so many different products?

- Insulator (Prevents heat gain or heat loss)
- Chemically resistant
- Does not conduct electricity
- High tensile strength
- Flexible (Able to be woven into a fabric)

*Because asbestos has so many useful properties, it has been used in over 3,000 different products (*textiles, building materials, automotive parts).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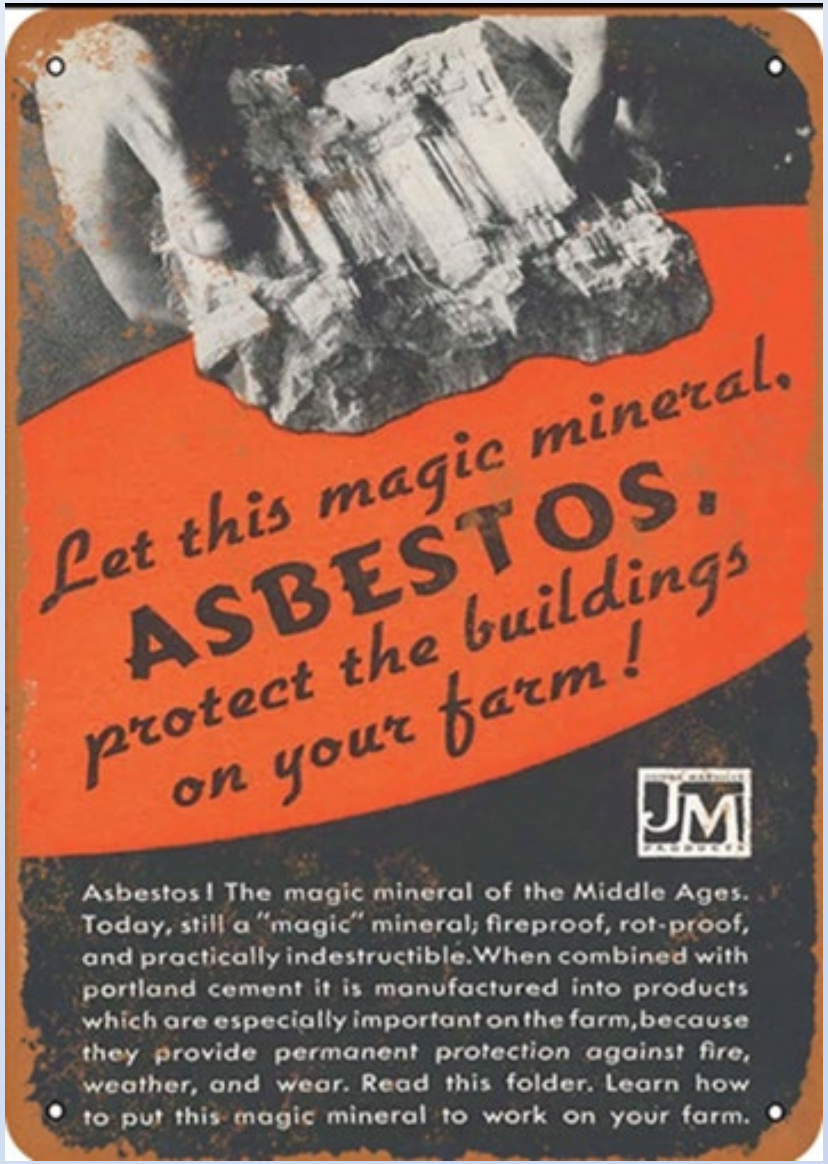
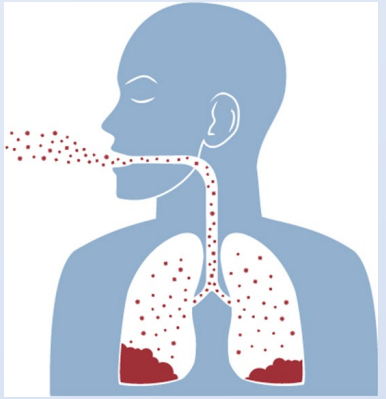

Let this magic mineral.
ASBESTOS.
protect the buildings
on your farm!
JM
Asbestos! The magic mineral of the Middle Ages. Today, still a "magic" mineral; fireproof, rot-proof, and practically indestructible. When combined with portland cement it is manufactured into products which are especially important on the farm, because they provide permanent protection against fire, weather, and wear. Read this folder. Learn how to put this magic mineral to work on your farm.

ASBESTOS



Exposure occurs when fibers become airborne and are inhaled.

ie materials disturbed via drilling/renovation activities, etc.

Three of the major health effects associated with asbestos exposure are:

- **Lung cancer**
- **Mesothelioma** (*a rare form of cancer that is found in the thin lining of the lung, chest/ abdomen and heart*)
- **Asbestosis** (*a serious progressive, long-term, non-cancer disease of the lungs*

The latency period for asbestos related disease is approximately 15 to 40 years.

Dose-Response Relationship:
The more Asbestos fibers inhaled,
the greater the risk to one's health.

ASBESTOS

What is an asbestos-containing material (ACM)?

Any products or building materials that contain more than 1% asbestos

The only way to determine if a material contains asbestos is proper sampling by a qualified professional with appropriate analysis by a qualified lab.

Testing of suspect ACMs is recommended to be conducted prior to impact of the material.

The state laws regulating asbestos professionals and activities have been in place for many years. Compliance with state and federal laws is required.

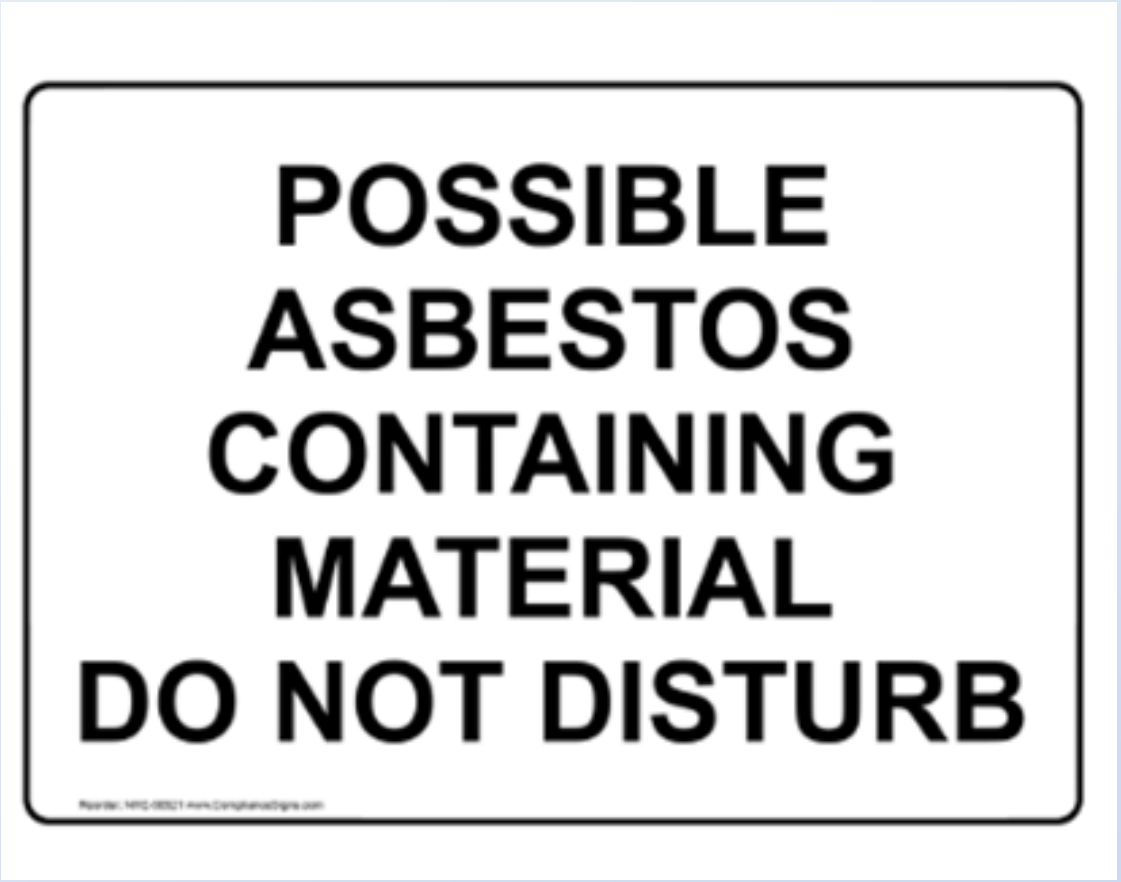
All building materials are suspected to contain asbestos until proven otherwise.

…With the exception of the following materials, which are considered Non-Suspect for asbestos:

- Wood
- Metal
- Glass
- Fiberglass/ Foam glass
- Rubber

SUSPECT ASBESTOS CONTAINING MATERIALS

- Wall/Ceiling materials
- Thermal System Insulation (TSI) materials
- Covebase materials/ mastics
- Flooring materials/ mastics
- Miscellaneous mastics
- Caulking materials
- Fire door core materials
- Cement siding (Transite)
- Roofing materials









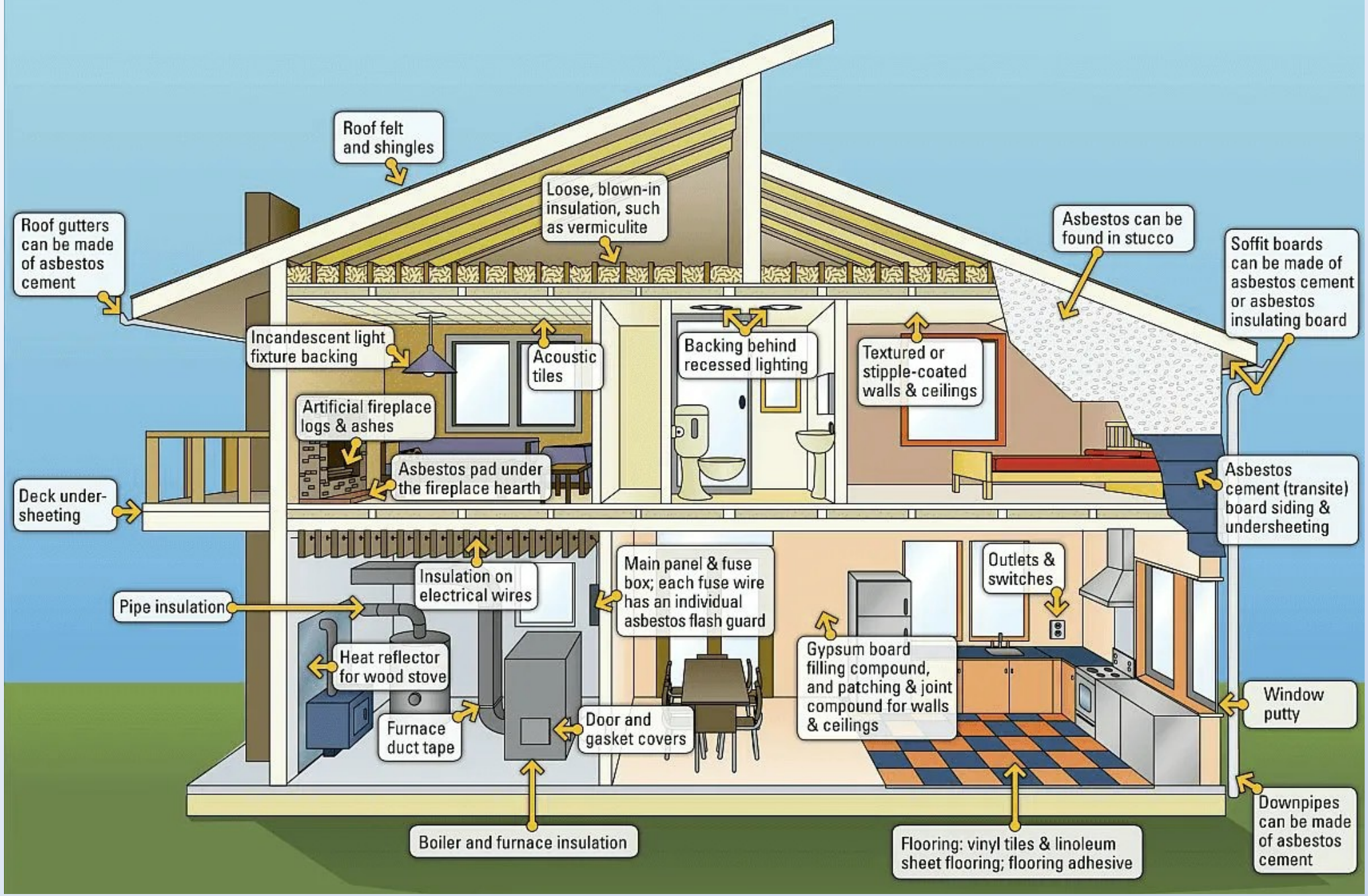
Indoor Environments 2025™

ASBESTOS

Vermiculite Awareness

Vermiculite is a naturally-occurring mineral composed of shiny flakes, resembling mica. It is a light-weight, fire-resistant, and odorless material, which has been used in insulation for attics and walls.

- Over 70 percent of all vermiculite sold in the United States from 1919 to 1990 was mined in Libby, Montana, where a deposit of asbestos contaminated the vermiculite.
- This vermiculite was used in the majority of vermiculite insulation in the United States.
- Often sold under the brand name *Zonolite*.


Roof felt and shingles
Loose, blown-in insulation, such as vermiculite
Roof gutters can be made of asbestos cement
Asbestos can be found in stucco
Soffit boards can be made of asbestos cement or asbestos insulating board
Incandescent light fixture backing
Acoustic tiles
Backing behind recessed lighting
Textured or stipple-coated walls & ceilings
Artificial fireplace logs & ashes
Asbestos pad under the fireplace hearth
Deck under-sheeting
Asbestos cement (transite) board siding & undersheeting
Insulation on electrical wires
Main panel & fuse box; each fuse wire has an individual asbestos flash guard
Outlets & switches
Pipe insulation
Gypsum board filling compound, and patching & joint compound for walls & ceilings
Heat reflector for wood stove
Window putty
Furnace duct tape
Door and gasket covers
Downpipes can be made of asbestos cement
Boiler and furnace insulation
Flooring: vinyl tiles & linoleum sheet flooring; flooring adhesive

LEAD-BASED PAINT (LBP)

Lead-based paint is defined as any paint or surface coating that contains lead in amounts equal to or exceeding 1.0 milligram per square centimeter (mg/cm^2) or 0.5% by weight.

Lead was used in residential paints until its ban in 1978.

Why was lead used in paint?

- Durability
- Moisture resistance
- Dried faster
- Pigment/Opacity

LEAD-BASED PAINT (LBP)

Intact lead-based paint is not dangerous.

The lead dust and paint chips that are released when it deteriorates, chips, peels, or is disturbed can be hazardous to human health. Ingesting or inhaling lead dust can cause serious health problems, especially for children.

LEAD-BASED PAINT (LBP)

There is no safe level of lead exposure.

Inhaling/ingesting lead dust or paint chips can have immediate negative effects on human health.

Note – The state laws regulating lead professionals and activities have been in place for many years. Compliance with state and federal laws is required.

LEAD-BASED PAINT (LBP)

Children

Even low levels of lead in the blood of children can result in:

- Behavior and learning problems
- Lower IQ and Hyperactivity
- Slowed growth
- Hearing Problems
- Anemia

In rare cases, ingestion of lead can cause seizures, coma and even death.

Pregnant Women

Lead can result in serious effects to the developing fetus and infant, including:

- Cause the baby to be born too early or too small;
- Hurt the baby's brain, kidneys, and nervous system;
- Increase the likelihood of learning or behavioral problems; and
- Put the mother at risk for miscarriage.

LEAD-BASED PAINT

- **Lead Renovation, Repair and Painting (RRP) Program Rules**
  Applies to all renovation, repair, and painting projects performed for compensation in target housing* and child-occupied facilities constructed prior to 1978.
- The RRP provides full or partial **exemption to the RRP** in the following cases:
  - Housing built in 1978 or later
  - Housing for elderly or disabled persons, unless children under 6 reside or are expected to reside there
  - Zero-bedroom dwellings (studio apartments, dormitories, etc.) unless a child under six years of age resides or is expected to reside there.
  - Housing or components that have been declared lead-free. Such a declaration can be made by a certified inspector or risk assessor. Also, a certified renovator may declare specific components lead-free using an EPA recognized test kit or by collecting paint chip samples and obtaining test results from an EPA recognized laboratory showing the components do not contain lead-based paint.
  - Minor repair and maintenance activities that disturb six square feet or less of paint per room inside, or 20 square feet or less on the exterior of a home or building.

LEAD-BASED PAINT

- **Lead Safe Housing Rule** (24 CFR Part 35)
  The LSHR also allows maintenance or hazard reduction projects that are not abatement, and that will disturb only minimal ("de minimis") amounts of LBP-coated surfaces to be conducted without using safe work practices (24 CFR §35.1350(d) or clearance (24 CFR §35.1340(b)). This exemption for "de minimis" amounts of paint disturbance applies when the total disturbance of painted surfaces is not more than:

  - **20 square feet on exterior surfaces;**
  - **2 square feet in any one interior room or space; or**
  - **10 percent of the total surface area on an interior or exterior type of component with a small surface area, like window sills, baseboards, and trim**

LEAD-BASED PAINT

Lead safe work practices in accordance with the O&M Program is key to preventing/ limiting lead hazards.

- Three important rules when dealing with lead-based paint:
  - **Never dry sand** lead-based painted surfaces.
  - **Minimize dust generation and dispersion** during any work involving lead-based painted surfaces.
  - **Always wet-clean**. After working on lead-based painted surfaces, always clean up using a damp wiping method, never dry sweep or dust.

HUD Financed/Insured Projects

LEAD-BASED PAINT - HUD PROJECTS			
	Project Scope	**Applicable Dates of Construction**	**Required**
Multi-family *HUD MAP*	Refinance (No planned rehab)	Prior to 1960	Lead Risk Assessment with limited paint testing at minimum + O&M
	Refinance (No planned rehab)	Prior to 1978	Presumed LBP O&M
	Rehab/ Demolition	Prior to 1978	Comprehensive LBP Inspection
Healthcare (SNF/ALF/MC/IL) *HUD LEAN*	EXEMPT HUD's lead-based paint requirements at 24 CFR Part 35 do not apply to housing designated exclusively for the elderly or persons with disabilities, unless a child of less than 6 years of age resides or is expected to reside in such housing		

NOTE: HUD's definition of *minor repair and maintenance* exemption is different than EPA's RRP –
2 square feet interior and 20 square feet exterior or 10 percent of the surface area of a small building component type

HUD Financed/Insured Projects

ASBESTOS - HUD PROJECTS			
	Project Scope	**Applicable Dates of Construction**	**Required**
Multi-family *HUD MAP*	Refinance (No planned rehab)	Prior to 1989	ASTM compliant Baseline Survey +O&M
	Rehab/ Demolition	All dates of construction	NESHAP compliant Comprehensive Survey +O&M
Healthcare (SNF/ALF/MC/IL) *HUD LEAN*	Refinance (No planned rehab)	Prior to 1978	ASTM compliant Baseline Survey +O&M
	Rehab/ Demolition	All dates of construction	NESHAP compliant Comprehensive Survey +O&M

Per SGM-SF-2023 Section 11

- **“Users of this document are responsible for establishing and implementing appropriate safety practices and compliance with applicable federal, state, and local regulations relating to worker health and safety.”**

Known Familiar Hazards

- Hantavirus
  - Contamination from rodents
- Pests
  - Roaches, wasps, bats, pigeons, etc
- Confined space
  - Permitted or non-permitted confined space
  - Working solo or with a team
  - Are you bringing in fresh air

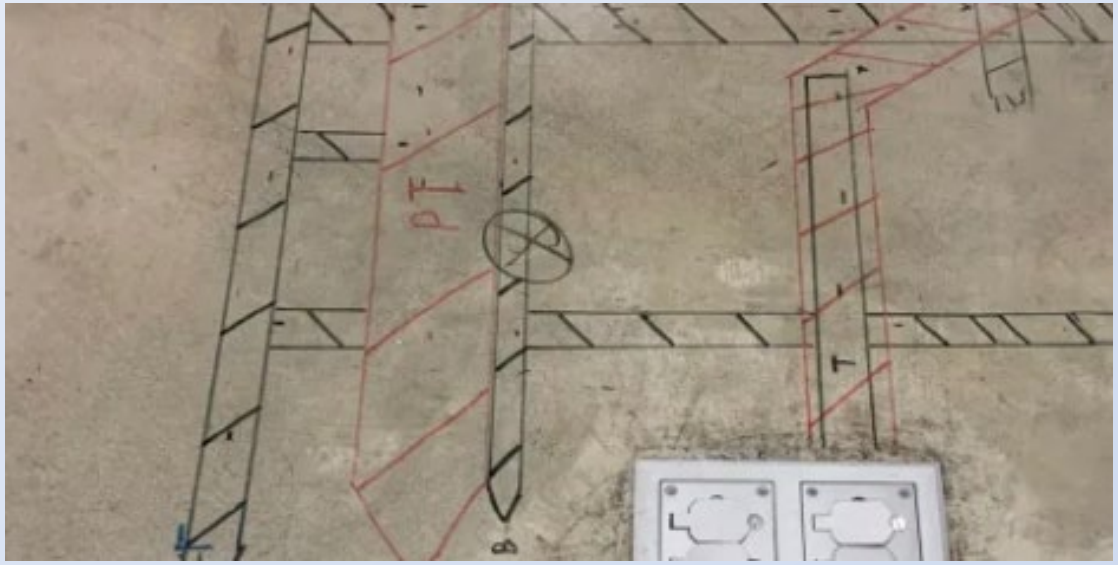
Known Familiar Hazards

- Working at heights
  - Equipment check
  - Building check (ie roof and siding)
  - Ground check
- Working with tools
  - Equipment check
- Electrical hazards
  - Do you know where the power is coming from?
  - >3-feet from electrical panel
  - Lock out tag out

Other Hazards

- Microbial Growth
- Silica exposure
  - Can be increased during drilling activities
- Flue gas spillage
  - Carbon Monoxide spillage from back drafting/ negative pressure
- Vapor hazards
  - Brownfields, LUST, RCRA, Superfunds

Other Hazards (continued)

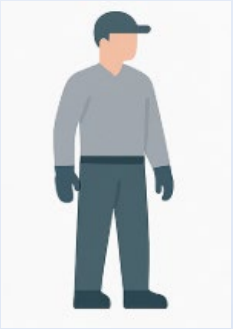


- Public Lines
  - Know before you dig - 811
  - This is the **LAW** in every state
  - Free services
- Private Scanning
  - Post-tension cables, footers, private utility lines, etc
  - Paid service

Implementation

- Safety Management Program – HASP (Health and Safety Plan)
  - Exposure to radon and radon decay products
  - Jobsite worker exposure shall be limited to 4 working level months (WLM) or 400 pCi/L-Months (pCi/L-M) over any 12-month period
  - Exposure to on the jobsite hazards
    - Working at heights, heat/cold stress, other contaminates, etc
  - Identifies emergency contacts and nearest emergency areas (ie hospitals, police station, fire station)
- Potential Safety Training Options
  - HAZWOPER (Hazardous Waste Operations and Emergency Response)
    - A certification that informs you on a set of OSHA standards designed to protect workers
  - ACM – EPA 2-hour awareness training
  - LBP – EPA RRP training

Implementation



- OSHA (Occupational Safety and Health Administration)
  - Each employer...
    - ...shall furnish to each of his employees' employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;
    - ...shall comply with occupational safety and health standards promulgated under this Act.
  - Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.
- PPE (Personal Protective Equipment)
  - Respirator - Particulate filters have proven in-effective in filtering radon gas. However, they have proven to be effective in reducing inhalation doses from radon decay products by 64%–72%[1].
  - Level D

[1] *Study of the filtration efficiency of radon progeny in facial masks*, October 2024 by J.E. Martínez, B. Juste, G. Verdú

Real World Practice When Asbestos/Lead Is Identified

- The below occurred during the BIDDING phase and was outlined in the proposal
  - Determined potential scope of work (interior/exterior system(s))
  - Asked for and reviewed the asbestos report and identified potential impact location(s)
  - Connected with the client and asked if renovations are occurring
  - Outline the need for abatement and GPRS services and built in fees for additional mobilizations and time

Real World Practice When Asbestos Is Identified

- The below occurred AFTER engagement of the project
  - Walk the property with asbestos abatement contractor and mark physical locations and a site map. During same mobilization walked with GPRS for scanning (pre-con walk)
  - Provide a written scope of work so the abatement contractor can add the work to their contract
    - (ie 1 sqft of drywall per unit and 5 sqft of vinyl sheet flooring (1 for the extraction point and 4 for test points see attached list of location, floor plans for each unit, and photos for marked locations. These locations have been scanned using GPRS)
  - In a perfect world, wait 24-hours after abatement and then begin your work

You have the power!

- Ask for Asbestos Reports
- Ask for Lead Based Paint Reports
- Ask about known hazards
- Be aware of job site hazards
- Ask if a Phase 2/Vapor Study has been done
- Plan and build in time as needed to properly handle these hazards
- We want to bring awareness to you and bring our industry to the next level, as we are being hired as a professional
- Knowledge is power, while you may not come across this on the day to day, it only takes one job

HELPFUL RESOURCES

- https://standards.aarst.org/
- https://www.epa.gov/asbestos
- https://www.epa.gov/lead
- https://www.epa.gov/lead/lead-renovation-repair-and-painting-program
- https://www.ecfr.gov/current/title-40/chapter-I/subchapter-R/part-745/subpart-
- https://www.epa.gov/sites/default/files/2020-03/documents/small_entity_guide_9-23-11_w_new_cover.pdf
- https://www.hud.gov/contactus/lead-based-paint-guidelines#close

QUESTIONS?