



## Got Asbestos? Overcoming Obstacles in Construction Projects

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 **EORM**<sup>®</sup>  
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# Webinar Logistics



## Session Format

- All participants are muted
- 45 minute presentation
- 15 minutes Q&A session
  - Use the question/chat feature on your sidebar to submit questions
  - We'll respond to as many questions as we can in the Q&A session so we can end on time!
- Web/Phone Conference Issues or Concerns
  - If you are having difficulty seeing/hearing the presentation, please submit your questions using the chat feature or
  - Call 925.988.9343
- **Presentation materials will be available after the session**

# About the Presenters



## Anthony Price, Senior Consultant

- California Certified Asbestos Consultant (CAC); California Department of Public Health Lead Inspector/Assessor (CDPH)
- Over 14 years of diversified experience in hazardous material management including asbestos and lead surveying, site assessments, regulatory review, and project management.
- Has provided project design services by developing project specifications as well as abatement contractor supervision and oversight, and abatement project close-out documentation.



# About the Presenters



## Russell Snyders, PE, Principal Consultant

- Registered Engineer in the states of Washington and Oregon, AHERA Building Inspector and Project Designer
- Over 35 years of experience in the environmental industry with experience in environmental assessment and remediation, asbestos, lead and mold assessment, management, and abatement project management.
- Has directed the environmental assessment of large, multi-property portfolios in support of the acquisition and divestiture activities.
- Has also been the Owner's Representative and managed asbestos management programs for a major university.





# Topics

What is  
Asbestos?

Typical Uses for  
Asbestos

Owner  
Requirements /  
Hazard  
Communication

Project Life  
Cycle

Case Studies

# What is Asbestos?



- Naturally occurring, fibrous mineral
- Used for thousands of years (ancient Romans, Greeks, etc.)
- Large scale industrial use started in 19<sup>th</sup> century
- Excellent material, due to unusual combination of properties:
  - Good insulator (Thermal, electrical, and acoustical)
  - Strong
  - Relatively lightweight
  - Fire and chemical resistant
  - Flexible

# What Does It Look Like?



- Serpentine (Chrysotile) is the most common type of asbestos and is also the California State Rock
- Other common types:
  - Amosite
  - Crocidolite



# Typical Uses for Asbestos



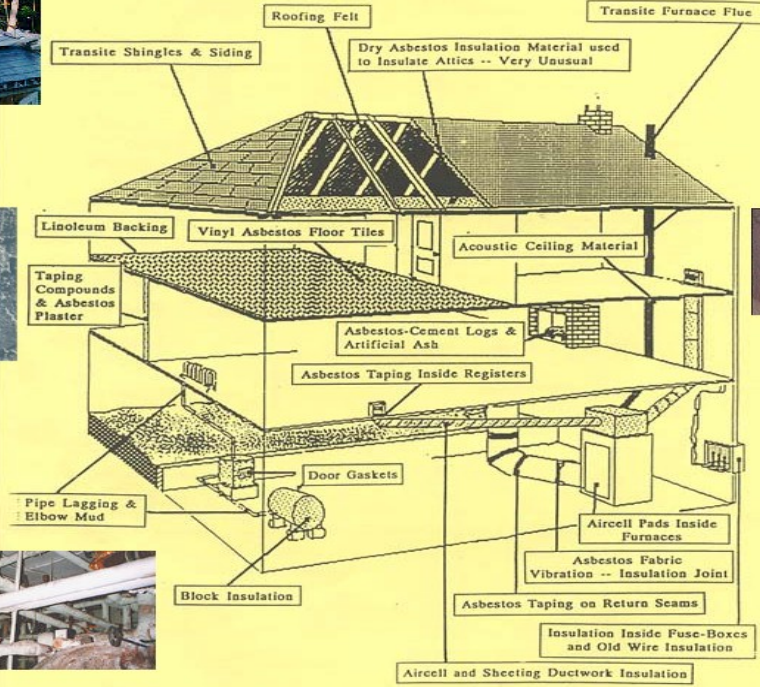
- Pipe, surface and duct insulations
- Acoustical plaster
- Spray-on fireproofing
- Joint compound
- Cementous panels (Transite™)
- Floor tiles
- Sheet flooring (on paper backing)
- Mastic







# Where might I find asbestos in my home?



Graphic: UC Berkeley Extension, Pacific Information Center



## Additional Suspect Materials

Waterproofing/  
expansion joint,  
between concrete  
layers

Fabric liner  
(Petromat) under  
asphalt

Material  
surrounding  
heating element in  
an old hair dryer

Cover for an  
antique ironing  
board

Silver paint on an  
old industrial  
storage shed

Countertop and  
inside panels on a  
laboratory fume  
hood



# Asbestos-Containing Products







# Asbestos-Containing Products



# Non-Suspect for Asbestos



- Rubber, silicone (clear or white flexible caulking)
- Vinyl
- Wood
- Glass
- Metal products

# Asbestos-Containing Materials (ACM)



- Regulations
  - Federal
    - » National Emission Standards for Hazardous Air Pollutants (NESHAP)
      - Part 61 of Title 40 of the Code of Federal Regulations (CFR)
    - » Asbestos Hazard Emergency Response Act (AHERA), 40 CFR Part 763
  - Containing >1% asbestos content, by weight
  - Applicable for handling, removal and O&M
  - Additional state and local regulations may apply
    - » Example: CA – Material with  $\geq 0.1\%$  asbestos content regulated for removal purpose
      - Asbestos Containing Construction Material (ACCM)

# Asbestos Danger

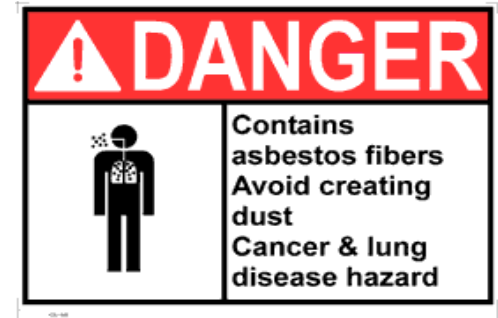


- Asbestos is Hazardous When Airborne Fibers are Inhaled
  - Shown to cause various illnesses
    - » **Asbestosis:** an emphysema-like condition
    - » **Lung Cancer**
    - » **Mesothelioma:** a cancer of the lining of the lung and abdominal cavities
  - Health effects of asbestos fibers
    - » Accumulate in tiny lung sacs (Alveoli)
    - » Hard to remove by mucous, so worsens scar tissues
    - » Conditions made worse by smoking (synergistic effect)
    - » Long gestation period before onset of symptoms

# ACM Hazard Communication



- Employers/Building Owners Requirements
  - Inform employees presence/location of ACM or Presumed ACM (PACM)
  - Keep records of presence, location and quantity of ACM and PACM
  - Means of communicating hazards of asbestos:
    - » Warning signs
      - Placed at **all approaches** to regulated areas
    - » Warning label
      - Placed on actual material
    - » Safety Data Sheets (SDS)
  - Additional employees/occupants notification (e.g., CA)







# Identifying and Removing ACM

## Survey

- By certified professionals
- Collection of bulk samples
- Comprehensive vs. Limited
- Estimate of quantities and locations of material
- Laboratory analysis
- Report showing positive and negative materials

## Abatement

- Contractor to verify quantities and requirements with consultant and owner
- Reporting requirement to pertinent EPA district
- Exceptions with certain jurisdictions
- Removal methods dependent on materials and quantities
- Post abatement air clearance sampling to ensure proper abatement and clean-up

# ACM Removal Considerations



- What kind/types of materials
  - Porous vs Non-Porous
  - Friable vs Non-Friable
  - Specific asbestos that are harder to wet
- Locations
  - Interior vs. Exterior
  - Accessible?
  - Better to enclose/encapsulate?
- Reasons for disturbing
  - Abatement
  - Operation and maintenance

# Asbestos Abatement



- Typical Interior
  - Poly vinyl containment
    - » HEPA filter air machine(s) for negative air environment
      - Exhausts to exterior of building
    - » Decontamination chambers (clean, shower, dirty/equipment rooms)
  - Wet method – no dry removal allowed (rare exceptions)
  - Personal Protective Equipment (PPE) for workers
  - Double bagged, generator information labeled, waste

# Asbestos Abatement



# Unexpected Abatements?



- Crawlspace soil – Fallen, deteriorated pipe insulation
- Attic – Roofing material debris fallen through wood slats during removal
- Wall void – Abandoned pipe insulation and electrical wire insulation (cloth)
- Machine room – Gasket debris from equipment dismantling
- Broken fire door
- Removal of previously abated ACM floor tile mastic

# Asbestos Operations and Maintenance



- Managing ACMs in place
  - Prevent damage and deterioration
  - Periodically inspect:
    - » Crack, scrapes, water staining, missing material, debris/dust under ACM
  - Keep away from known/suspect ACM:
    - » Do not lean/hang/brush/sand/drill etc.
    - » Avoid air or physical contact
  - Preventing exposures
    - » Follow safe work practices – Do not disturb ACM
    - » Avoid damaged and/or friable ACM
    - » Report damage or disturbance

# Asbestos Operations and Maintenance



- Asbestos is only hazardous when fibers become airborne
- Avoid impacts and disturbance to keep fibers from being released into air
- Intact/undisturbed ACM is not a hazard
- To prevent exposure to asbestos
  - Do NOT generate dust/dry sweep/non-HEPA vacuum near ACM area

# Asbestos Disposal



- Requirements
  - Hazardous asbestos waste
    - » Asbestos content greater than 1% and the material is friable
  - Non-hazardous asbestos waste
    - » Asbestos concentration is greater than 1% and the material is non-friable



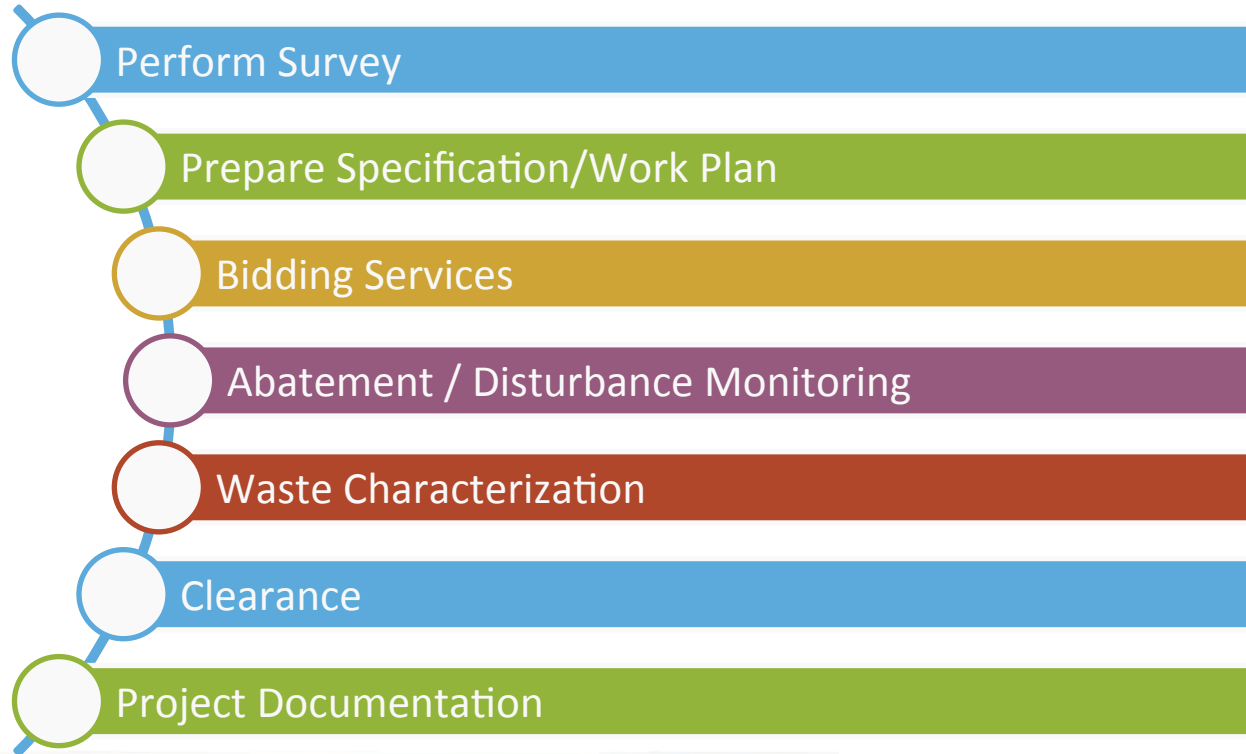
# Other Hazardous Material Encountered



- Commonly found during demo/renovation
  - Lead Containing Materials
  - PCB
    - » Fluorescent light ballasts
    - » Electrical transformer
  - Mercury
    - » Thermostats
    - » Switches
    - » Fluorescent lamps
  - Mold



# Project Life Cycle



# Key Questions



- Any upcoming renovation and/or demolition projects?
- Purchasing a property or expanding existing facility?
  - Asbestos surveys required prior to disturbance
- Are known asbestos containing materials being managed in place?
  - Operations and maintenance program
  - Third party review of program to find any gaps in compliance

# Case Study: Space Planning



## Issues

- The Owner would like to renovate a space for a new laboratory space
- There are three locations under consideration
- Which space has the less impact from a Building Sciences perspective?

# Case Study: Space Planning



## Evaluation

- First obtain a sketch of the locations
- Simple floorplan outlined in highlighter
- Understand the extent of renovation
- Are there additional utility needs?
- Special ventilation requiring exterior exhaust
- Has the space been renovated in the past?



## Case Study: Space Planning

### Option One

- Space is located in a steel building
- Steel columns and beams have asbestos containing sprayed fireproofing
- Overspray on pan deck and HVAC ductwork
- Significant abatement required
- Isolation of project area required
- Negative pressure enclosure required
- Major labor efforts to remove and clean for the follow on trades



# Case Study: Space Planning

## Option Two

- Candidate space is far from mechanical room
- Mechanical and electrical requirements
- Route is through pipe runs with asbestos containing pipe insulation
- Poor condition
- Abatement of pipe insulation required
- Dirt crawl space
- Other critical systems located in same area
- Risk Management Decisions



## Case Study: Space Planning

### Option Three

- In an older concrete building
- Seismically needs additional work
- Asbestos-floor tile and mastic
- Accessible hard pipe fittings



# Case Study: Space Planning



## Cost Comparison

- From a purely Building Sciences Perspective
  - Option One: \$150,000
  - Option Two: \$75,000
  - Option Three: \$25,000

# Case Study: Space Planning



- By having an asbestos survey in place

*AND*

- By proactively managing a capital program
  - The asbestos impacts can be evaluated in a matter of hours instead of days or weeks
  - Multiple alternates may be quickly assessed

# Case Study: Emergency Response



## Issues

- The Owner has a tower with four pipe heating and cooling system
- It is the middle of a work day and the space is occupied
- The plumbing pipe ruptures and there are five floors impacted by cascading water

# Case Study: Emergency Response



## Evaluation

- Where do you start?
  - The restoration crew is on the way
    - » To start vacuuming the water
    - » Remove unsalvageable materials
    - » Installing drying systems

# Case Study: Emergency Response



## Evaluation

- Intent is to dry the water impacted gypsum wallboard and carpeting
- What certifications are required for the workers?
- What personal protection is required for the workers?
- What equipment should be used?

# Case Study Emergency Response



- If you have an asbestos survey for the property
  - You know if there is asbestos-containing material present
  - You can notify the response vendor
  - Proper procedures and protocols are implemented
  - Regulators are happy
  - Risk Management is limited to Business Continuity

# Case Study: Emergency Response



- Real Case
- Asbestos-containing fireproofing
- Asbestos-containing joint compound on gypsum wallboard system
- Asbestos-containing wall texture
- Asbestos-containing black mastic on floor

# Case Study: Emergency Response



- How did it effect the response?
- Certified asbestos workers
- Asbestos project
- Proper personal protective equipment
- No regulatory citations



# Case Study: Emergency Response



- If no asbestos survey onsite
  - Potential to impact asbestos containing materials
  - Potential exposure to restoration team
  - Spreading of asbestos contamination beyond effected area
  - Potential to be on the evening news
  - Potential regulatory inspections

# Case Study: Emergency Response



- No surveys in place
  - Required to have an accredited inspector take samples
  - Samples must be analyzed
  - Lose the first critical hours of the response

# Case Study Floor Tile Mastic Removal



- Issues
  - Renovating a space above Critical Care Wing
  - Concern for Noise and Vibration Impacts
  - Substrate Conditions

# Case Study: Floor Tile and Mastic



- Many methods of abatement, not all removal
  - Chemical removal
  - Bead blasting
  - Grinding
  - Razor Scraping and float

# Case Study: Floor Tile and Mastic



## Evaluation

- Decision was made early in the project
- Furniture was a separate contract
- Required anchoring to slab
- Furniture installation included abatement

# Case Study: Floor Tile and Mastic



## Lessons Learned

- Abatement projects created due to encapsulated asbestos mastic
  - Leveling of high spots to level floors
  - Core drilling for all utility penetrations
  - Anchoring fixtures using expansion anchors
  - Mastic is still there for future projects



Questions?

Thank You!

