

Best Practices For Dealing with Mold, Indoor Air Quality & Asbestos by F. Stephen Masek

Goals: Tenant Retention & Expense Reduction

Keeping tenants happy and saving money are high priorities in any times, but especially now. There has been a sharp increase in the number of tenant employee complaints regarding indoor air quality, so successfully dealing with them is vital to keeping tenants happy. Mr. Masek's experience with thousands of properties and projects has yielded many insights, and some humorous examples of the massive level of tenant employee paranoia (and some greed) now facing facility professionals. Dealing with mold often requires dealing with materials which may contain asbestos. Asbestos may be "old news," but how many facility professionals know that asbestos was used in many common building materials through the middle to late 1980s? Mold may also be "old news," but is a major part of the indoor air quality issue. Mold is un-regulated in most places, and the quality of "restoration" crews varies dramatically, so facility professionals need to know how to evaluate their work. A well-informed facility professional will save the owner money by preventing excessive costs, expensive change orders, or still more expensive fines and lawsuits.

Presenter's Background & Expertise

Mr. Masek is president of a consulting company in its 22nd year which only works for property owners and managers, not tenants. Mr. Masek also provides expert witness services. His company's clients include the largest owner of high-rise buildings in southern California, school districts, cities, and other consulting companies seeking specialized expertise. Their major areas of expertise are asbestos, mold, indoor air quality, lead-based paint, "universal wastes," Phase I Environmental Site Assessments, Property Condition Assessments (electrical, roof, plumbing, and such), and remediation project design, monitoring, and documentation. He obtained California certifications as an asbestos consultant in 1992 and as a lead consultant in 1993, the years those certification programs began, and was providing those services prior to those dates. He is an active member of ASTM, helped write the original standard for Property Condition Assessments, and participated in multiple rounds of revisions to the Phase I Environmental Site Assessment standard. He has written numerous magazine articles for regional and national publications, and presented at local, state, and national conventions.

Sometimes You Have To Laugh

Paranoid people often do funny things, as do incompetent "restoration" contractor personnel. A spicy noodle bowl prepared in a microwave oven caused evacuation of an entire office leased by a federal agency, and cost \$10,000 of fire department, consulting, owner, and tenant time. When employees of a government agency found no support for their complaints from mold, small-particle dust, volatile organic compounds, and other testing, they claimed exposure to pesticides in a high rise office where none are used. A soy-based floor tile mastic removal solvent caused great concern until it was pointed-out that it smelled just like tofu. Improper use of equipment as common as de-humidifiers by "restoration" contractor personnel should be rare, but is surprisingly common. Some try to dry the entire Earth, and others recycle the moisture (demonstration display during the presentation).

Asbestos Collection Hands-On

People enjoy seeing some of Mr. Masek's collection of materials which contain asbestos (in safe containers), as they help people learn and understand what materials may contain asbestos. Examples include non-asbestos 9" x 9" floor tile and asbestos 12" x 12" floor tile to dispel the myth that the tile size matters. Multi-layer flooring systems show the importance of hiring a good consultant. Odd materials include sugar-cane fiber ceiling tile with asbestos. Some materials are still in the original containers.

Defusing Paranoia and Greed

Tenant employees who think they may be the next to be laid off, and tenants desperate to get out of leases may think that claiming that “the building is making me sick” is an easy way to solve their problem. Other tenant employees may see sensational and biased new stories from the mainstream press. The general decline in the quality and depth of scientific education in schools may also be a factor. Whatever the reasons, the number of such claims have dramatically increased during the last 10 years. Investigations of over 90% of such claims by Mr. Masek’s company have shown no problem with the building. The most common real problem is lack of adequate fresh air, resulting in elevated carbon dioxide levels, and it is rather rare. Real or imagined, the best defense against such claims is a good offense.

Hiring a good full-service environmental consulting company:

- Obtains the use of the expensive specialized test equipment needed to investigate such complaints;
- Provides data from an independent third party which is much more credible; and,
- Brings their expertise and experience dealing with such issues.

A good consultant begins by interviewing the people involved and then visually examining the building areas associated with the claim. This may include mechanical rooms and adjoining vacant spaces. The site visit should be performed during normal working hours. This means that the conditions experienced by the employees are being tested. It also means that the employees will see that a professional consultant has been hired and is performing testing and inspection to address the claim (equipment demonstrated during the presentation).

The large amounts of data obtained from such testing and the formal report produced perform three key functions:

- 1) Providing information to identify a hidden problem(s);
- 2) Impresses tenants and/or tenant employees that a thorough investigation of their complaint has been performed; and,
- 3) When no problems are identified, makes it clear to complaining employees that they would have to refute a large amount of data in an impressive formal report to continue pressing their claim. They almost never continue with the claims when faced with such a report (sample reports shown during the presentation).

Key Parts Of A Mold Management Program

Going back to the days of the “Mold Is Gold” type seminars for attorneys, preventing lawsuits and keeping small problems from becoming large problems has been accomplished through careful planning and preparation. Mr. Masek’s company worked with a large condominium complex where attorneys were sending people door to door soliciting for lawsuits against the home owners’ association. While the seminars and door to door solicitors are gone, mold lawsuits and the potential to loose tenants due to inadequate response are not.

Significant mold growth may be present two days after a water intrusion event, and water often spreads further with time. Time wasted fumbling about trying to determine what to do and to find and hire vendors causes

the problem to grow (pun intended).

Leases should require that tenants promptly report any water intrusion or suspected mold or indoor air quality problem. Tenant report forms provide a way to document when a problem was first reported. Mr. Masek has sample forms and lease terms to review. The lease terms and forms prevent successful claims of a long-standing problem which was ignored.

Consultants, contractors, and equipment vendors all need to have been identified before they are needed. As many building owners in the area affected by Hurricane Sandy learned, it is wise to have restoration and abatement contractors under contract, with rates and other terms pre-determined.

Many materials can be dried if enough equipment is promptly deployed and correctly used. However, drywall over insulation and double layers walls are best cut-out as soon as is possible. The sooner the wet areas are removed, the less material will need to be removed, as water wicks through such materials.

The first step after receiving a report of a problem is having a full-service environmental consulting company investigate and prepare a formal report containing recommendations and a scope of work, if any remediation is needed. Full service means a consulting company able to deal with highly regulated asbestos, lead-based paint, PCBs, and such, not just a mold-only company which can not provide all of the services needed. There is no license or government certification for mold consulting, so anybody can be a ditch-digger one day, and be a mold consultant the next day. Asbestos must be assumed to be present in suspect materials, or the suspect materials must be properly sampled by a certified/licensed consultant and analyzed by an accredited laboratory. Avoid contractors who also claim to perform inspections. That is illegal in California for asbestos, and an obvious conflict of interest for mold.

While it may be possible to obtain same-day asbestos analytical results, the cost is high, and it delays water intrusion response. Asbestos also has to be assumed to be present for all other work in the building which disturbs suspect materials (list below). Therefore, it is far better to have comprehensive asbestos surveys (inspections) performed for all buildings constructed before 1990. Asbestos surveys are a small one-time expense, especially if an efficient small company which assigns senior experienced people to the project is used, rather than a big high-overhead company which assigns junior staff to the project.

Another key component of a pro-active mold management program is inspections for plumbing defects. Copper to galvanized pipe connections will all eventually leak. If a facility professional is fortunate, the leak will be relatively small, but many will burst catastrophically, often flooding large areas of a building. Mr. Masek has several photos of such connections in high-rise buildings.

Indoor Air Quality- Carbon Dioxide to Sewer Gas

The most common testing is for mold, carbon dioxide, carbon monoxide, sewer gas, and volatile organic compounds. Testing for mold is done with portable computerized air pumps and specialized sampling cassettes which are submitted for laboratory analysis. Swabs and tape lift sample may also be collected when suspect mold is visually identified. Testing for carbon dioxide, carbon monoxide, and sewer gas is done with hand-held portable test instruments. Sewer gas may come from broken pipes, dry traps, or old drains which are hidden by newer finishes or furniture. The hand-held instrument facilitates finding such sources easier. Volatile organic compound testing could be done with hand-held equipment, but testing with vacuum canisters yields a long list of data in a formal report from a testing laboratory, so is more helpful in addressing employee concerns. Fine dust (particulate) testing is also be accomplished with portable instruments, although it is less common a concern. Testing for formaldehyde is now rare, as usage of it in new particle board and such has declined.

Asbestos Is Dangerous, Common, and Highly Regulated

Since asbestos was widely used in many common building materials until the late 1980's (list provided during the presentation), it is important to obtain an asbestos survey from an experienced and properly licensed/certified consultant prior to performing building renovation, repair, or demolition work which will disturb materials which may contain asbestos. Some people say that mold is the new asbestos. Unfortunately, mold is often growing on materials which contain asbestos.

The actual inspection should be performed by an experienced senior consultant. Asbestos surveys are inexpensive, so facility professionals should have one for every commercial, industrial, and multi-family building constructed prior to 1990. As is the case with most other services facility professionals purchase, it pays to seek superior quality and value. Due to their high overhead, large companies may send junior staff or trainees, or will charge two or three times what a small company will charge for a proper asbestos survey performed by senior consultants.

The word asbestos is derived from a Greek adjective meaning inextinguishable. The Greeks admired its soft and pliant properties, as well as its ability to withstand heat. Asbestos was spun and woven into cloth and utilized for wicks in sacred lamps. The Romans likewise recognized the properties of asbestos and its purported they cleaned asbestos tablecloths by throwing them into the flames of a fire.

From the time of the Greeks and Romans in the first century until its re-emergence in the eighteenth century, asbestos received little attention or use. It was not available in large amounts until extensive deposits were discovered in Canada in the nineteenth century (late 1800's). Following this discovery, asbestos emerged as an insulating component in thermal insulation for boilers, pipes, and other high temperature applications, as a reinforcement material for a variety of products, and a heat and fire resistant component of various products, and as a filler.

Asbestos is a naturally occurring mineral. It is distinguished from other minerals by the fact that its crystals form into long, thin fibrous bundles composed of minute hollow fibers. Deposits of asbestos are found throughout the world. Chrysotile, the only mineral in the serpentine group, is the most commonly used type of asbestos. Chrysotile is commonly known as "white asbestos." Five types of asbestos are found in the amphibole group. Amosite, the second most likely type to be found in buildings, is often referred to as "brown asbestos" and its resistance to acid and heat is very high. Crocidolite, "blue asbestos", is also very resistant to acid and to the effects of outdoor exposure. Crocidolite was utilized in high temperature insulation applications. The remaining three types of amphiboles, anthophyllite, tremolite, and actinolite, are rare and of little commercial value, but are sometimes found in materials such as vinyl cove base mastic.

The dangers of asbestos were known 100 years ago, and it was one of the first things regulated when EPA and OSHA were formed in the early 1970s. Some people do not take the dangers of asbestos seriously due to the time lag, often 15 to 30 years, between exposure and onset of disease. Asbestosis occurs when asbestos fibers become lodged in the lungs, resulting in the formation of permanent scar tissue and shortness of breath which grows worse over time. Lung cancer is far more common in people exposed to asbestos, and smoking greatly increases the risk of developing lung cancer from exposure to asbestos. Mesothelioma, or cancer of the lining of the chest or abdomen, is almost always caused by exposure to asbestos.

Besides the risk of disease, there is also the substantial risk of lawsuits, fines and criminal prosecution due to violations of the many asbestos laws and regulations. There are numerous federal and state regulations, and some local regulations, such as those of various air quality management districts in California.

Three techniques are used to prevent asbestos exposures and releases to the environment. First, water, especially water with a surfactant (soap) added, is used to wet materials which will be disturbed. Secondly,

materials are removed inside of work areas called negative pressure containments. Blowers with filters fine enough to stop asbestos fibers (High Efficiency Particulate Air) are set-up to create a suction into the work area, preventing the escape of asbestos fibers. Thirdly, the workers removing the asbestos wear protective coveralls and gloves, which they remove before showering on the way out of the work area. Asbestos contractors must be properly licensed, and their workers must be properly trained.

A good tight-fitting NIOSH/P-100 respirator is required for asbestos work. Respirators are available in ½ face, full face, powered, air-line supply, and self-contained (air tank) versions to provide the level of protection needed for various tasks. Companies requiring employees to wear respirators also need to have a formal OSHA-compliant respiratory protection program.

The most common materials which may contain asbestos in commercial and industrial buildings are:

Suspect Material	Notes and Approximate Usage Dates
Acoustic Ceiling Texture	Through the mid to late 1970s
Acoustic Plaster	Through the mid 1970s
Adhesives / Mastics (flooring, mirror, pipe insulation, etc.)	Through the 1980s
Asphalt Floor Tile	Through the 1960s
Boiler and Vessel Insulation	Through the mid-1970s
Breeching / Flue Insulation	Through the mid 1970s
Caulking and Sealants	Through the mid-1980s
Ceiling Tiles and Lay-in or Suspended Ceiling Panels	Prior to the early 1970s, often are heavy and have a "layered" internal appearance
Drywall Joint Compound (Also Known As Mud, Sometimes Also Used as a Skim or Texture Coat)	Manufactured and applied through the mid-1980s
Duct Insulation (corrugated or paper)	Sometimes found on register boots and ducts through the mid-1980s
Fiber-Cement Conduits	Through the 1980's
Fiber-Cement Ducts (one common brand is Transite)	Common for underground HVAC ducts through the 1980s
Fiber-Cement Flues (one common brand is Transite)	Used through the 1980s, although usage tapered off sharply after the 1970's
Fiber-Cement Sheets - Interior, Exterior, or in Freezers/Chillers, (some made with wood patterns, one common brand is Transite)	Used through the 1970s, with some usage in the 1980s
Fiber-Cement Pipes (one common brand is Transite)	Through the 1980's and some may still be in use

Suspect Material	Notes and Approximate Usage Dates
Fiber-Cement Cooling Tower Slats and Other Components (one common brand is Transite)	Through the 1980s
Fire Door Interior Insulation	Through the 1970s
Fireproofing Materials (as on structural steel)	Through the mid to late 1970s
Flexible Duct Connectors (also known as vibration cloths)	Soft woven cloth, easy to differentiate from fiberglass or rubber
Gaskets	Still in use
Mastics (floor tile, mirror, ceiling tile, etc.)	Through te 1980s
Paint - textured or elastomeric / coatings	Through the mid to late 1970's
Packing Materials (for valves or for wall/floor penetrations)	Through the 1980s
Pipe Insulation (corrugated air-cell, block, etc.)	Through the 1970s
Plaster (interior gypsum plaster, which typically consists of two or more layers	Rare, used prior to the mid 1970's
Plastic Roof Cement (typically applied at flashings, joints, and penetrations, may brands are still manufactured with asbestos)	Very common, still legally manufactured, sold and applied
Roofing Felt / Tar paper	Through the 1970's and into the 1980s
Roofing Shingles or Roll Roofing	Through the 1970s and into the 1980s
Sheet Vinyl Flooring	Through the 1980s
Silver Roof Paint	Through the 1970s and into the 1980s
Spackling Compounds	Through the 1970s
Spray-Applied Insulation	Through the mid to late 1970s
Stucco, or Cement Plaster, which typically consists of two or more layers	Generally, used through the 1980s, but still legal, still in use as of early 2006 in Phoenix
Tank and Vessel Insulation	Through the mid to late 1970s
Taping Compounds (drywall joint compound)	Through the mid 1980s
Textured Paints / Coatings (paints made with texture, not texture applied before painting)	Through the 1970s
Vinyl Floor Tile	Through the mid 1980s