
# ENVIRONMENTAL MONITORING REPORT

Building Inspection for Asbestos and Lead Paint Survey

for

Michigan State University
Jenison Fieldhouse
Lansing, Michigan

February 2001

Project #AI00-3225

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# BUILDING INSPECTION FOR ASBESTOS AND LEAD PAINT SURVEY

## for

## Michigan State University, Jenison Fieldhouse
## AI00-3225

INTRODUCTION

Wonder Makers Environmental was retained by Michigan State University (MSU) to perform an asbestos inspection and lead paint survey at Jenison Fieldhouse in East Lansing, Michigan. The details of the inspection, survey scope, and schedule were discussed with Greg Sweeney of Rossetti and Greg Houghtaling of MSU.

The physical inspection of Jenison Fieldhouse took place in November and December of 2000 and January of 2001. In conjunction with the physical inspection, asbestos bulk samples were collected and analyzed.

A lead paint survey was also conducted of the Jenison Fieldhouse. Lead paint samples were collected and analyzed.

This report incorporates information collected by Wonder Makers Environmental prior to the site visit and during the inspection conducted on the dates noted above, the sample results as determined after the inspection, and comments made by G. Sweeney in conjunction with the site visit.

CERTIFICATION

The inspection was conducted by Dave Batts, whose technical qualifications include certification as an asbestos inspector, certification as an asbestos management planner, certification as an asbestos abatement supervisor, certification as an asbestos project designer, certification as a lead supervisor, and others.

All asbestos samples were analyzed by Dave Batts and David Woods, who are certified to analyze air samples following the NIOSH 7400 method and to analyze asbestos bulk samples by means of polarized light microscopy. Their bulk sample training is from McCrone Research Institute, where they have successfully completed the course on polarized light microscopy.

31 lead paint samples were analyzed by Dave Batts, who completed the lead abatement contractor supervisor training course. LeadCheck swabs were used to test paint chips of different color paints to determine if lead was present. The LeadCheck swabs utilize sodium rodizonate to create color change if the chemically moistened swab comes in contact with lead. 18 lead paint samples were sent to Mets Laboratories in Waldorf, Maryland, for quality control and to determine lead content. These samples were analyzed via the Lead Analysis Method EPA SW-846, 7420.

## BACKGROUND INFORMATION

### *Asbestos*

Exposure to airborne asbestos fibers has been shown to cause a number of serious and/or fatal illnesses in humans. Because of this, asbestos-containing materials (ACM) are highly regulated by federal, state, and local agencies. These agencies have determined various limits of exposure which are acceptable (*i.e.*, OSHA Permissible Exposure Limit of 0.1 fibers per cubic centimeter of air [f/cc], MIOSHA clearance level of 0.05 f/cc, EPA Recommended Clean Air Value of 0.01 f/cc, etc.). In order to keep exposure below recommended limits, strict guidelines are enforced for the handling of asbestos; not only if exposure to airborne fiber levels of asbestos exceeds the various limits, but also if ACM is handled or disturbed during renovation or demolition activities.

Liability concerns based on extensive legal action involving asbestos products have also contributed to the increased interest in handling asbestos properly. However, contrary to common belief, the mere presence of asbestos does not necessarily require the removal of the ACM. Other options, such as enclosure, encapsulation, repair, and/or periodic surveillance of intact products, are recognized by the EPA as acceptable options, depending on the specific circumstances of the facility.

The hazard posed by an asbestos-containing product is not only based on its asbestos content, but also on the likelihood that it will release fibers into the air. Because of this, the EPA has developed the term "friable" to identify those materials that can be crumbled, crushed, or pulverized by hand pressure when dry. Friable asbestos-containing material poses a greater risk than non-friable asbestos products. In addition, the EPA definition of asbestos-containing materials only includes those items with more than one percent asbestos.

Although asbestos has been found as a component of over 4,000 different products, the initial review of the former Jenison Fieldhouse indicated only a small number that would be of specific concern.

A brief description of the major classes of products reviewed at every site follows:

Aircell pipe insulation is composed of asbestos paper corrugated into half-round sections that are placed over the top and bottom of a pipe. The aircell insulation may be held in place with a canvas cover, metal bands, wire, or tape. Because it is easily damaged and has a high asbestos content (35 to 90 percent), aircell is considered very dangerous when disturbed.

Asbestos paper was often used to insulate air ducts and foundation walls. It normally consists of over 90 percent asbestos.

Ceiling tiles of either a drop-in format or glue-on style have been known to contain asbestos. Some fire-rated tiles have been found to contain up to 20 percent asbestos.

Cellulose pipe insulation, sometimes referred to as woolfelt, is composed of a large number of tightly wrapped sheets of paper, which create an effect similar to a roll of paper towels. Very little of the actual cellulose material has ever been detected with an asbestos content. However, many times cellulose pipe insulation will have an asbestos-containing tarpaper layer as the inner wrap or high-percentage asbestos paper as the outer or inner layer.

Drywall and patching compounds were often manufactured with an asbestos additive as a binder.

Electrical cables or wires were often insulated with asbestos, especially if the wires carried high voltage or were used in hot equipment, such as stage lights or heaters.

Fire doors can have asbestos insulation as a core.

Fireproofing was often sprayed or tamped on the structural members of a building. Asbestos content ranges from more than 1 to 95 percent, depending on the binder used. Such fireproofing may be light and fluffy or hard and dense.

Fire resistant wallboard, containing 50 to 80 percent asbestos, was often used as a fire barrier around furnaces, stoves, chimneys, and other hot items.

Floor tile many times contains asbestos as a binder. While asbestos may be a component of any size or shape tile, the nine-inch by nine-inch square tiles installed between 1930 and 1988 often contain asbestos. Many tile mastics and flexible baseboards also have asbestos as a component.

Furnace brick is a light tan to a dark brown material used to line the inside of furnaces, boilers, kilns, chimneys, and other heating devices. It ranges from a soft and light consistency to heavy, dense material with a smooth texture. Asbestos content of furnace brick ranges from zero to 60 percent.

Gasket materials, particularly those used in high temperature applications, often contain asbestos. Their color ranges from grey to brown with consistency from smooth and flat to braided and flexible.

Magnesium silicate insulation is sometimes referred to as mag. This versatile insulation usually contains between 15 and 50 percent asbestos. It is generally found as a white chalk-like material that has been formed into batts, blocks, half rounds for pipes, or bricks.

Pipe fitting insulation or compound is often referred to as mud. It is applied in a wet state around elbows, T's, reducers, etc., and allowed to dry. It may be covered with a canvas outer wrap or left bare. Asbestos mud was manufactured with 20 to 100 percent asbestos. It can be found applied in conjunction with asbestos or non-asbestos pipe insulation.

Insulation finish coats are similar to mud discussed above but are applied to boiler, duct, tank, and breaching insulation to give it a smooth appearance. It was typically applied over mag block, aircell, fiberglass, mineral wool, or chicken wire and covered with canvas. This material can contain from more than 1 to 50 percent asbestos.

Loose-fill insulation was often dumped, blown, or sprayed in place. Most often rock wool or mineral wool was used for this purpose, but numerous asbestos cases have been documented. This material can contain from 1 to 25 percent asbestos.

Plaster has been found with an asbestos content of 2 to 25 percent. It was both sprayed-on and trowel-applied. Asbestos plaster can have a smooth, granular, hard, or soft texture. Decorative plaster is often found with asbestos, which helped hold together the intricate patterns.

Powerhouse cement is the name given to non-asbestos fitting compounds. It is often used in conjunction with fiberglass pipe insulation and looks similar to asbestos mud.

Tarpaper roofing felts and shingles often contain asbestos fibers as a binder. The addition of 5 to 25 percent asbestos was often used to give the asphalt flexibility, strength, and ultraviolet resistance.

Textiles woven from asbestos were used as expansion joints for ducts, fire blankets, flame resistant clothing, curtains, cords, and felts. Asbestos content is 50 to 100 percent.

Textured and reflective paint often had asbestos added to produce thickness.

Transite is the name given to products that are made from asbestos-containing cement. Transite is most commonly found as large diameter pipes, building siding, roof decks, tabletops, fume hoods, and oven insulation. Transite usually contains 10 to 50 percent asbestos.

Underlayment used with tile or linoleum often contains asbestos.

*Lead*

Lead (Pb) is a naturally occurring substance that can dramatically impact the central nervous systems of exposed individuals. It can be found naturally in Michigan soils and has also been used as a solder to connect water supply pipes to drinking fountain coolers. Lead can leach into the water supply from such pipe and cooler seams. Lead dust contamination can come from a variety of sources including:

- Natural deterioration of paints which contain lead.
- Mechanical disturbances of paints with lead by sanding, sawing, drilling, grinding, sandblasting, burning, or demolition.
- Welding or torch cutting items containing or coated with lead.
- Mechanical disturbance of lead products such as radiation shields and electrical wire insulators.
- Loading or reloading ammunition.
- Shooting or cleaning firearms.

Such contamination poses a hazard from both inhalation of the airborne particles and ingestion from hand-to-mouth activity. Lead consumed by individuals in this manner may cause blindness, retardation of intelligence development, tremors, various problems of the central nervous system, blood disorders, reproductive problems, and death.

The current federal OSHA lead standard for general industry is titled or cited at 29 CFR 1910.25. Michigan's OSHA program (MIOSHA) has adopted the federal standard as its base. Allowable lead concentrations are measured in micrograms ($\mu g$) per cubic meter of air ($m^3$) or deciliter of blood (dl). OSHA and MIOSHA regulations set the following limits for workers potentially exposed to lead:

Permissible exposure limit – 50 $\mu g/m^3$ for an 8-hour time weighted average (TWA)
Action level – 30 $\mu g/m^3$ for an 8-hour TWA

Medical Removal – 50 $\mu g/dc^3$ of blood (biological monitoring)

Since there are limited MIOSHA regulations regarding acceptable levels of lead-contaminated dust on surfaces, current industry standards recommend that control activities be performed according to the practices described by the Housing and Urban Development (HUD) and EPA protocols.

The current HUD/EPA guidelines call for no more than 50 micrograms of wipeable lead per square foot on floors. The standard is usually extended to other flat, non-porous, horizontal surfaces because of their relative ease in cleaning. HUD/EPA guidelines for windowsills are currently 500 micrograms per square foot, with window wells at 800 micrograms per square foot. The rationale for the higher allowable concentration for such items is that their shape and contour reduce the effectiveness of cleaning procedures. As such, the 500 and 800 micrograms per square foot are often utilized for a variety of surfaces that do not have broad flat characteristics.

## GENERAL INSPECTION PROCEDURES

In an effort to determine if there was a hazard posed by asbestos and lead paint products in Jenison Fieldhouse, an extensive inspection procedure was followed. A visual inspection of the entire facility was matched with the collection of an appropriate number and distribution of bulk samples.

After reviewing the general layout, a visual inspection of the building was completed. This included all floors, storage rooms, crawl spaces, and roofs to be impacted by the locker room renovation project. Access was not provided to all areas of the site. Each individual area was coded on the diagram with a number. Any bulk samples that were collected as part of this inspection were coded 3225-xx (xx stands for a sequential two-digit numerical code).

Determination of suspect asbestos-containing products was based on visual evidence, bulk sample analysis, age of the material, and professional experience. All bulk samples of friable materials were collected using wet methods and coring tools.

Determination of which lead paints to check was based on visual evidence and professional experience.

Several items that were observed by the inspector were immediately determined to be non-asbestos; these included fiberglass pipe insulation, wooden wallboard, and wooden studs.

No attempt was made to collect mastic samples from the floor tile, although mastic was analyzed as a part of each tile sample.

Destructive testing was not conducted as part of this asbestos and lead paint building inspection. As such, quantities of ACM and lead-containing paints shown in chases or behind plaster surfaces have been estimated. Additionally, some asbestos-containing material and lead-containing paint hidden from view may be present and may not have been accounted for as part of this inspection.

## Results of Visual Inspection

Based on the initial inspection of the building, fifty-one separate suspect asbestos-containing materials were identified. Some suspect asbestos-containing materials were sampled a number of times in different locations on plaster and drywall. All suspect asbestos-containing materials observed at the time of the inspection are listed in the visual inspection form (appendix D). Information from lab analysis is incorporated into the bulk sample analysis report (appendix B) for ease in interpreting the report.

Based on the initial inspection of the building, forty-six separate suspected lead-containing paints were identified. Those paints are listed on the sample collection log (appendix A) and the paint survey and sample log (appendix C).

## Bulk Sample Results

The information garnered from the collection and analysis of asbestos bulk samples and lead paint by WME personnel is shown in appendix A (sample collection log) and appendix B (bulk sample analysis report). The sample collection log and the bulk sample analysis report give a description of each material, location where it was collected, and analysis results. The lead paint analysis results are detailed in the summary of results in the sample collection log and in appendix C. The approximate location of each bulk sample is noted on the diagram in appendix G with the two-digit sample number.

## Summary of Asbestos Conditions

A number of asbestos-containing materials were identified at Jenison Fieldhouse. These include pipe insulation, mudded fitting insulation, mudded fitting insulation debris, electrical cloth insulation, and tank insulation on the basement level; pipe insulation, mudded fitting insulation, and ceiling surfacing material on the first floor level; pipe insulation, mudded fitting insulation, electrical wiring on lighting, transite, and floor tile on the second floor level; pipe insulation and mudded fitting insulation on the third level; pipe insulation and mudded fitting insulation on the fourth floor level; and roofing flashing materials on the roof.

ASBESTOS CONTROL RECOMMENDATIONS

Based on the information gathered during this asbestos inspection, the following prioritized recommendations are offered. These recommendations may have to be adjusted if change of ownership, emergency, or other factors substantially alter the condition or use of the building.

1. Notify the building owner and occupants of the presence of asbestos-containing products in the building. This notification should be given to any outside contractors (*e.g.*, demolition or renovation contractor personnel) who are contracted to work within the building and may disturb the asbestos-containing materials. Depending on the specific activity being performed, maintenance or repair personnel may need to utilize personal protective equipment or other engineering controls.

2. Plan for the proper removal of any asbestos-containing materials prior to renovation or demolition of the facility.

3. Begin a program of asbestos control (removal or encapsulation), starting with areas that pose the greatest hazard. Suggested control actions follow:

## SUMMARY CHART OF ASBESTOS CONTROL

| Priority/Description | Recommended Response Action | Suggested Time Frame | Estimated Cost |
|---|---|---|---|
| 1. Asbestos containing pipe insulation, mudded fitting insulation, ceilings, and roof flashing impacted by the locker room renovation project. | Removal | Prior to the locker room renovation project | $44,500 |
| 2. Asbestos containing pipe and mudded fitting in rooms 9 and 18. | Patch and repair | During the locker room renovation project | $1,500** |
| 3. Damaged asbestos-containing pipe and fitting insulation along with damaged cloth wrap electrical insulation in the basement. | Patch and repair, clean-up | During the locker room renovation project | $1,500** |

* The cost estimates are based on current industry prices. Unless otherwise indicated in the recommendations, it is assumed that the work is performed by licensed, competent organizations. Estimates include all costs, including independent air monitoring of abatement projects. Estimated cost is based on project size, difficulty, access, etc. Some savings may be possible by combining projects.

** Abatement contractors usually have a minimum mobilization cost for any small asbestos abatement job.

## SUMMARY OF SURVEYED LEAD PAINT CONDITIONS

Eighteen lead-containing paints were identified in Jenison Fieldhouse. These included: black paint on the breaker panel in mechanical room 23 in the basement; medium green paint on equipment in room 10 and tank insulation in mechanical room 7 in the basement; orange paint on the large breaker box cover in the hallway of the basement; green paint on doors, frames, walls, and floors in the basement; beige paint on walls, ceilings, and in the courts in the basement; white paint on walls and ceilings in the basement; red paint at fire extinguisher locations in the basement; brown paint on doors and frames in the basement; medium brown paint on HVAC units and ducts in the basement; orange paint on HVAC units and ducts in the basement; gray paint on pipe insulation in the basement; brown paint on doors, frames, and windows on the first floor; black paint on the railing in the pool area; white paint on ceilings and ducts on the first floor; beige paint on walls and ceilings on the first floor; green paint on doors, frames, and wall partitions on the first floor; brown paint on doors, frames, and windows on the second floor; and white paint on the lower ceiling in the gymnastics area of the third floor.

## LEAD CONTROL RECOMMENDATIONS

Based on the information gathered during the lead paint survey, it is recommended that any renovation activities that disturb the lead-containing paint be done using proper work practices and engineering controls by qualified contractors.

Following renovation, surface sampling for lead contamination should be done to ensure lead contamination has not been spread during renovation activities.

## CONCLUSION

This facility inspection to determine the location of asbestos-containing products and the survey to determine the locations of lead paints was conducted in accordance with the appropriate laws and current industry standards.

For additional information, please contact Wonder Makers Environmental at P.O. Box 50209, Kalamazoo, Michigan 49005-0209, phone (616) 382-4154; fax (616) 382-4161.

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