POTENTIALLY HAZARDOUS MATERIALS
BUILDING INSPECTION REPORT

for

Michigan State University
Engineering and Architectural Services
Physical Plant Building, Room 101
East Lansing, Michigan 48824-1326

at

Michigan State University
Malcolm Trout Food Science and Human Nutrition Building
East Lansing, Michigan 48824

Inspection conducted by

Fibertec, Inc.
1914 Holloway Drive
Holt, Michigan 48842

Project # 16592-1

Project Date: August 20 through September 16, 2002

Final Report Date: October 1, 2002

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INTRODUCTION

Fibertec, Inc. was retained by Michigan State University to perform a building inspection for potentially hazardous materials at the Michigan State University Malcolm Trout Food Science and Human Nutrition Building, East Lansing, Michigan. The project was discussed with Mr. Dave Erickson of MSU-ORCBS, prior to beginning the fieldwork. The inspection was designed to identify potentially hazardous materials within the building including asbestos containing material, lead paint, mercury vapor in fluorescent light bulbs, Polychlorinated Biphenyls (PCB's) in fluorescent light fixture ballasts, mercury in switches and thermostats and hydraulic oil in hydraulic door closers. The project included all rooms and corridors, excluding Room 13, perchloric fume hoods and associated exhaust ductwork. The inspection was conducted in preparation for building renovation.

The hazardous materials building inspection took place on August 20 through September 16, 2002. During the inspection, bulk samples of suspect asbestos-containing material (ACM) and suspect lead paints were collected. Collected asbestos bulk samples were submitted to the Fibertec, Inc. Polarized Light Microscopy (PLM) laboratory for analysis. Collected paint samples were submitted to the Corrosion Control Consultants and Labs, Inc., Kentwood, Michigan or Fibertec, Inc. Holt, Michigan for lead analysis.

CERTIFICATION

Kristin Thick, a State of Michigan accredited asbestos building inspector, conducted the building inspection. Ms. Thick also maintains accreditation as an Asbestos Contractor/Supervisor and Management Planner. A copy of Ms. Thick's asbestos inspector credentials appear in Appendix A.

John Walker or Steven Day, both trained polarized light microscopists analyzed all bulk asbestos samples. All samples were analyzed in the Fibertec, Inc. PLM laboratory, which maintains current NVLAP accreditation (Lab Code 101510-0). A copy of the Fibertec, Inc. NVLAP accreditation certificate appears in Appendix B.

Trained laboratory chemists analyzed all lead paint samples. All samples were analyzed by Corrosion Control Consultants and Labs, Inc., an ELLAP and NLLAP accredited laboratory or by Fibertec, Inc., an AIHA PAT participating laboratory.

GENERAL INSPECTION PROCEDURES

In an effort to identify asbestos-containing material (ACM) and lead-containing paint in all areas of the facility an extensive inspection procedure was followed. A visual inspection of all rooms in the structure was combined with the collection of an appropriate number and distribution of bulk samples. The visual inspection included all rooms and corridors, excluding Room 13 and the perchloric fume hoods and associated exhaust ductwork.

Determination of suspect asbestos-containing material was based on visual examination, bulk sample analysis, material age and professional experience. Specifically, materials similar in color and texture were classified into homogenous areas (*e.g.*, white smooth wall and ceiling plaster). An appropriate number and distribution of samples were collected from material in each homogenous area. All samples were analyzed by polarized light microscopy. When the results of analysis of all samples from a homogenous area indicate no asbestos present (less than or equal to one percent) the homogenous area is considered to be a non-asbestos containing material. When the results of analysis indicate asbestos present (in a quantity greater

than one percent) in just one sample of those collected from a single homogenous area, the material in the entire homogenous area must be considered asbestos containing.

Destructive testing (*i.e.*, demolition) was not conducted as part of this asbestos building inspection. As such, quantities of ACM believed to exist in inaccessible areas (like pipe joint insulation in wall cavities or above the plaster ceilings) have been estimated. Additionally, some asbestos-containing material hidden from view may be present and may not have been accounted for as part of this inspection (like Pyrobar bricks between cinderblocks).

Determination of lead paint was based on visual examination and bulk sample analysis. Specifically, a sample of each observed major paint color was collected pursuant to the requirements of ASTM Standard E1729-95 Standard Practice for Field Collection of Dried Paint Samples. All paint samples were submitted to Corrosion Control, Kentwood, Michigan or Fibertec, Inc., Holt, Michigan for analysis. When results indicate lead levels above 0.5 weight percent, the paint is considered lead-based. When the results indicate lead present below 0.5 weight percent and above the detection limit, the paint is considered lead-containing. When the results indicate lead present at or below the method detection limit, the paint is considered non lead-containing.

The identification of other potentially hazardous materials including, fluorescent light bulbs presumed to contain mercury vapor, PCB containing ballasts/transformers (labeled as PCB containing or not labeled as non-PCB containing), mercury switches/thermostats and hydraulic oil in door closers were made by detailed visual inspection.

RESULTS OF VISUAL INSPECTION

Based on the inspection, 63 distinct suspect asbestos-containing materials (only 16 of which actually contain asbestos) and 11 suspect lead paints were identified in the Michigan State University Food Science and Human Nutrition Building, East Lansing, Michigan. Some suspect asbestos-containing materials were sampled a number of times in different locations, white smooth wall and ceiling plaster, being an example. All suspect asbestos-containing materials and suspect lead paint observed at the time of the inspection are listed in the Room by Room Asbestos and Paint Building Inspection Forms. Information from lab analysis of collected samples is incorporated into the Room by Room Asbestos and Paint Building Inspection Forms to facilitate interpretation of the data. Fluorescent light bulbs, PCB ballasts, mercury switches/thermostats and hydraulic door closers were identified and their presence is enumerated on the bottom of the Room by Room Asbestos and Paint Building Inspection Forms.

BULK SAMPLE RESULTS

The information gathered from the inspection is included in Appendices C (Bulk Asbestos and Paint Sample Log), D (Bulk Asbestos and Paint Sample Analytical Report) and E (Room by Room Asbestos and Paint Building Inspection Forms). The lab analysis reports give a description of each sample, location where each was collected, and the results of analysis. A photo log appears in Appendix F. Additionally, floor plan drawings of the building appear in Appendix G.

SUMMARY OF ASBESTOS-CONTAINING MATERIALS AND LEAD PAINT

The following materials were found to contain asbestos at the Food Science and Human Nutrition Building:

Pipe joint insulation <6” diameter
Pipe joint insulation >6” diameter
9” x 9”, brown floor tile
Reflector paper (light fixtures)
Black countertops (lab bench tops) and shelves
Gray countertops (lab bench tops)
Brown paneling (transite in hoods)
Black sink undercoating
Red/brown duct caulk

Black window caulk
Gloves
Elevator brake pads
6”, black cove molding mastic
White conduit wrap

The following materials were found not to contain asbestos at the Food Science and Human Nutrition Building:

Drywall
Drywall joint compound
4”, dark brown cove molding and associated mastic
Plaster
4”, black cove molding and associated mastic
Black mastic on 9” x 9”, brown floor tile
2’ x 2’, white waved drop ceiling tile
4”, gray cove molding and associated mastic
6”, black cove molding
Black flashing
12” x 12”, white floor tile with brown streaks and associated mastic
Fire brick from incinerator
Gray flashing
Black asphaltic material
Gray duct caulking
Duct wrap
Vibration collars
2’ x 4’, white waved drop ceiling tile
Boiler gaskets
Black mastic under carpet
2’ x 2’, off-white drop ceiling tile
2’ x 2’, white smooth drop ceiling tile
12” x 12”, off-white floor tile and associated mastic
White sheet floor tile and associated mastic
Black window sills
12” x 12”, white floor tile and associated mastic
12” x 12”, brown floor tile and associated mastic
White sink undercoating
Gray caulk from the Cooling Tower
Brown panel from the Cooling Tower
White caulk from the Cooling Tower
Black vibration collar from the roof
Gray caulk from the vents on the roof
Black caulk from the vents on the roof
Green louvers from the vents on the roof
Brown caulk from the ventilation stack on the roof
Dark brown caulk from the ventilation to the hoods
Cement material from supply duct
Felt and board material on VAV boxes
Light brown duct caulk
Gray and brown duct caulk
White caulk on roof between bricks
White paint
Light brown duct caulk
Condensate pipe insulation
Gray duct/pipe sealant
Brown duct caulk

The following material was assumed to contain asbestos at the Food Science and Human Nutrition Building:

Fire doors and frames
Floor tile mastic, Telephone Room 36

The following paints were found to be lead-based at the Food Science and Human Nutrition Building:

Gray paint from the chiller
Green paint near condensate line (ME 25)
Brown paint from tower # 3

The following paints were found to be lead-containing at the Food Science and Human Nutrition Building:

White paint
Brown paint
Gray paint from cooling tower
White paint from Chiller #1
Green paint from condensate line
Blue paint

The following paints were found to be non lead-containing at the Food Science and Human Nutrition Building:

Off-white paint
Gray paint

No hydraulic door closers were found at the Food Science Building. Fluorescent light bulbs were presumed to contain mercury vapor and ballasts were presumed to contain PCBs. Mercury switches/thermostats were not found in the building.

CONCLUSION

Non-friable (can not be crumbled, pulverized or reduced to powder by hand pressure when dry) known or assumed asbestos-containing materials, (*e.g.*, 9" x 9", brown floor tile) were identified at the Food Science and Human Nutrition Building.

Friable (can be crumbled, pulverized or reduced to powder by hand pressure when dry) asbestos-containing materials, (*e.g.*, pipe joint insulation) were identified at the Food Science and Human Nutrition Building.

Fire doors and frames and floor tile mastic in Telephone Room 36 were assumed asbestos containing. Sampling and analysis of these materials will reveal their actual asbestos content, if any.

Three paints were found to be lead-based paint. Six paints were found to be lead-containing. Two paints (off-white and gray) were found to be non-lead containing.

Other potentially hazardous materials, including: PCB ballasts and fluorescent light bulbs were discovered during the course of this inspection.

This inspection, to determine the location, quantity and condition of ACM and lead paint, was conducted in accordance with the inspection provisions of the Asbestos Hazard Emergency Response Act (AHERA 40 CFR, Part 763) and the EPA Asbestos Sampling Bulletin dated September 30, 1994 and current industry standards.

RECOMMENDATIONS

Based on the information collected during this hazardous material building inspection, the following recommendations are offered. These recommendations are based on plans to renovate the buildings and may

have to be adjusted if change of ownership, emergency, change in the scope or sequencing of renovation or other factors alter the condition, use or planned use of the building.

Perform the following in this case:

- Notify the owner, building maintenance staff, and contractors of the presence of ACM, lead paint and other potentially hazardous materials within the building. Ensure that contractors who work in the vicinity of or who may encounter potentially hazardous materials during the course of their work have successfully completed hazard awareness training. Ensure that contractors who work in the vicinity of or who may disturb asbestos-containing materials or lead-containing paint, do so pursuant to the requirements of the Lead in Construction Standard 29 CFR 1926.62 and/or the Asbestos in Construction Standard 29 CFR 1926.1101. Given the multiple phases of the work, multiple hazard awareness training sessions will likely be required.
- Plan for and conduct removal of all potentially hazardous materials that will be impacted by renovation prior to the renovation. Specifically, perform the following before the renovation work in each phase: (Begin in basement Room 30-35 and the corridor, then proceed to Mechanical Room 25, East Mechanical Room, corridors on the 1st and 3rd floors – east, rooms on the 1st and 3rd floors – east, 2nd floor – east and east basement, west Mechanical Room, 1st and 3rd floor corridors – west, 1st and 3rd floor rooms – west, 2nd floor corridor – west, 2nd floor rooms – west, Mechanical Room 317 and abate Column D/G, as required to accommodate the renovation.)
    - Remind trades involved in the project of the presence, location, quantity and condition of ACM in and around the vicinity of their work, which will not be removed and which they must carefully work around.
    - Remove and recycle fluorescent light bulbs presumed to contain mercury vapor. Specially trained staff are required and equipment designed to capture mercury vapor from crushed bulbs may be required. Ensure that waste manifests are correctly completed. The electrical trade contractor, with appropriate training, should conduct this work.
    - Remove and recycle fluorescent light fixture ballasts presumed to contain PCBs, replace light fixtures. Ensure that waste manifests are correctly completed. The electrical trade contractor, with appropriate training, should conduct this work.
    - Remove asbestos-containing pipe joint insulation from above drop ceiling tile in rooms and corridors affected by the renovation. Conduct this work by the negative pressure glovebag technique.
    - For work in Mechanical Room 25, remove lead-containing paint from select portions of the chilled water tanks and domestic water tanks so they may be unbottled and removed. Do not cut apart the chiller tanks as bromide residue can turn to bromine gas during tank cutting.
    - For work on the roof, remove the lead-containing paint from the cooling towers so they may be dismantled, or remove them entirely intact.
- After occupants have been moved from the renovation area for each phase of the work conduct the following:
    - Remove sections of duct with asbestos-containing duct caulk. A demolition contractor with 8-hour task specific training (and the appropriate insurances and safety programs) may conduct this work, rather than a fully licensed asbestos abatement contractor.
    - Remove fume hoods.
- Ensure that lead-containing paint painted surfaces (those containing more than 0.06 weight percent lead) are demolished manually. Ensure that workers performing this work have sufficient training. If manual demolition is not practical/possible, ensure that appropriate personal protective equipment and engineering controls are in place.
- Conduct on-site air monitoring during asbestos removal and lead painted surfaces demolition to document compliance with applicable regulations and to document acceptable air quality following the work.

COST ESTIMATE

Two cost estimates are provided. The cost in Table 1 includes the cost of abatement of potential hazards necessary to accommodate the replacement of the HVAC systems and components in the building. Replacement costs are not included in this estimate.

The cost estimate in Table 2 includes the costs of Table 1 and the cost to remove all accessible pipe joint insulation from the building. Replacement costs are not included in this estimate.

Table 1
Estimated Abatement Cost
(necessary to accommodate HVAC system replacement)

Service	Estimated Units	Unit Cost	Subtotal
Asbestos countertop and drying rack removal and disposal – Room 30	192 s.f.	$5.00/s.f.	$ 960.00
Fume hood removal and disposal (non-friable transite panels)	55 hoods	$500.00/hood	$ 27,500.00
Fume hood removal and disposal (friable transite panels)	5 hoods	$1,000.00/hood	$ 5,000.00
Asbestos countertops below fume hoods, removal and disposal	900 s.f.	$5.00/s.f.	$ 4,500.00
Conduit wrap – Room 34 to vaults – removal and disposal	200 l.f.	$20.00/l.f.	$ 4,000.00
Reflector paper in Electrical Room lights removal and disposal	5 fixtures	$100.00/fixture	$ 500.00
9” x 9” floor tile removal – Rooms 31 and 32	400 s.f.	$2.00/s.f.	$ 800.00
Pipe joint insulation removal and disposal on all floors and Mechanical Rooms	2,030 fittings	$20.00/fitting (average)	$ 40,600.00
Patch and repair and debris cleanup of damaged joints not to be removed	100 joints and 100 s.f.	$5.00/joint $5.00/s.f.	$ 1,000.00
Ductwork in hallways, classrooms, stairwells and shafts	8,900 l.f. of duct	$7.50/l.f.	$ 66,750.00
Removal of lead painted chillers, cooling tower, mechanical room equipment	Estimated removal cost for chillers, duct, cooling tower equipment		$ 30,000.00
PCB ballast removal and disposal/recycling	500 ballasts	$6.25/ballast	$ 3,125.00

Fluorescent light bulb removal and disposal/recycling	2,000/bulbs	$1.25/bulb	$ 2,500.00
Awareness training	8 sessions (2 per phase)	$325.00/session	$ 2,600.00
Independent third party air monitoring – asbestos	Up to 80 days	$500.00/day	$ 40,000.00
Independent third party air monitoring – lead	Up to 30 days	$600.00/day	$ 18,000.00
Drain and dispose of PCB oil in transformer in Room 30	Estimate 55 gallons	$36.00/gallon	$ 1,960.00
Contingency	Estimate 20% of $249,815.00		$ 49,963.00
Estimated Total			$299,778.00

Table 2
Estimated Abatement Cost
(to accommodate HVAC replacement and includes Accessible pipe joint insulation removal)

Service	Estimated Units	Unit Cost	Subtotal
Asbestos countertop and drying rack removal and disposal – Room 30	192 s.f.	$5.00/s.f.	$ 960.00
Fume hood removal and disposal (non-friable transite panels)	55 hoods	$500.00/hood	$ 27,500.00
Fume hood removal and disposal (friable transite panels)	5 hoods	$1,000.00/hood	$ 5,000.00
Asbestos countertops below fume hoods, removal and disposal	900 s.f.	$5.00/s.f.	$ 4,500.00
Conduit wrap – Room 34 to vaults – removal and disposal	200 l.f.	$20.00/l.f.	$ 4,000.00
Reflector paper in Electrical Room lights removal and disposal	5 fixtures	$100.00/fixture	$ 500.00
9” x 9” floor tile removal – Rooms 31 and 32	400 s.f.	$2.00/s.f.	$ 800.00
Pipe joint insulation removal and disposal on all floors and Mechanical Rooms	3,500 fittings	$20.00/fitting (average)	$ 70,000.00
Ductwork in hallways, classrooms, stairwells and shafts	8,900 l.f. of duct	$7.50/l.f.	$ 66,750.00

Removal of lead painted chillers, cooling tower, mechanical room equipment	Estimated removal cost for chillers, duct, cooling tower equipment		$ 30,000.00
PCB ballast removal and disposal/recycling	500 ballasts	$6.25/ballast	$ 3,125.00
Fluorescent light bulb removal and disposal/recycling	2,000/bulbs	$1.25/bulb	$ 2,500.00
Awareness training	8 sessions (2 per phase)	$325.00/session	$ 2,600.00
Independent third party air monitoring – asbestos	Up to 100 days	$500.00/day	$ 50,000.00
Independent third party air monitoring – lead	Up to 30 days	$600.00/day	$ 18,000.00
Drain and dispose of PCB oil in transformer in Room 30	Estimate 55 gallons	$36.00/gallon	$ 1,960.00
Contingency	Estimate 20% of $288,215.00		$ 57,858.00
Estimated Total			$345,858.00

* Cost includes the cost of removal of material assumed to contain asbestos. Testing may reveal that materials are not, in fact asbestos and may not need to be removed.

- The cost estimates are based on current industry prices. It is assumed that the work is performed by licensed, competent organizations. Estimates include all costs of abatement projects except replacement. Estimated cost is based on project size, difficulty, access, and multiple phases required to complete the work. The cost assumed heat, water and power necessary to conduct the work will be provided by the owner.

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