August 19, 1997

REPORT: Full Building Survey

TO: Tim Nelson, Facilities Management's Asbestos Coordinator, 400 Donhowe Building
Sam Talbert, Manager, Zone 3, Facilities Management, B-117 Moos Tower

FROM: Kelly Brown, Asbestos Group, Environmental Health and Safety, W-140 Boynton
Health Service, 410 Church Street, S.E., Minneapolis, MN 55455

SUBJECT: Asbestos Material Survey - Masonic Cancer Center (Building 107)
EH&S Project No: 107-97-047
Client Project No: for database

Scope of Work: A full building asbestos material survey was conducted on April 17, 1997 through August 6, 1997. The purpose of the survey was to identify asbestos-containing materials (ACM) as defined by the Environmental Protection Agency (EPA), the Occupational Health & Safety Administration (OSHA), and the Minnesota Department of Health (MDH). Any material that is greater than 1% asbestos is considered to be ACM. The intent of the survey was to identify both friable and non-friable suspect ACM, identify non-friable ACM that may become friable under demolition or renovation conditions, and to provide approximate cost estimates for the removal of identified ACM in Masonic Cancer Center.

Project Description: Two hundred nine (209) bulk samples of suspect ACM were collected on-site and one hundred seventy-seven (177) were analyzed via polarized light microscopy (PLM) by the University of Minnesota Department of Environmental Health and Safety’s asbestos laboratory for asbestos content. Results of analyses are listed in Appendix I of this report. Appendix I is formatted to provide a room by room inventory of suspect ACM, the asbestos content of each material listed, and friability. An explanation of the tables and abbreviations used in the tables is included with Appendix I. Appendix II is a room by room listing of only those suspect materials that tested >1% asbestos. Minnesota Department of Health (MDH) Asbestos Rules regulate only friable ACM (material may be reduced to powder or dust under hand pressure) while the EPA regulates ACM that may become friable under demolition or renovation conditions.

Previous limited asbestos building surveys of Masonic Cancer Center were performed by University of Minnesota Department of Environmental Health and Safety and/or Facility Management on April 14-22, 1992, May 26, 1992, June 10, 1992, April 19, 1993, October 28, 1996, November 4, 1996, December 19, 1996 and February 24, 1997. Information from these previous surveys is included as part of this survey. The areas designated with an (*) following the location in Appendices I and II contain information from the previous surveys. Furthermore, samples taken during these surveys are designated with a date following the sample description. If abatement of these areas has taken place since it had been surveyed, the contents and quantities may have changed.
The following friable or potentially friable materials tested positive as ACM in the building:

- <4" white fibrous pipe insulation (PI)(1)
- <4" pipe fitting insulation (PFI) on white fibrous line (2)
- <4" PFI on fiberglass w/tar line (8)
- <4" fibrous PFI on fiberglass line (10)
- 4"-8" white fibrous PI (11)
- 4"-8" PFI on white fibrous line (12)
- 4"-8" fibrous PFI on fiberglass w/tar line (18)
- 9"-14" white fibrous PI (21)
- 9"-14" PFI on white fibrous line (22)
- 4"-8" PFI on styrofoam line (27)
- white fibrous tank (32)
- 9"x9" floor tile, brown w/white streaks (assumed) (41)
- 9"x9" floor tile, tan w/white & brown streaks (assumed) (42)
- 9"x9" floor tile, green w/white streaks (assumed) (43)
- 9"x9" floor tile, cream w/brown streaks (assumed) (44)
- 9"x9" floor tile, light brown w/white and brown streaks (assumed) (45)
- 9"x9" floor tile, olive w/cream & black (assumed) (46)
- 9"x9" floor tile, cream w/grey streaks (assumed) (47)
- 9"x9" floor tile, cream w/brown & grey (assumed) (49)
- 9"x9" floor tile, brown w/white & dark brown streaks (assumed) (50)
- 9"x9" floor tile, brown w/dark brown & cream splotches (assumed) (51)
- 9"x9" floor tile, light brown w/white & dark brown streaks (assumed) (53)
- 9"x9" floor tile, cream w/brown specks (assumed) (54)
- 12"x12" floor tile, grey w/black & white specks (62)
- 12"x12" floor tile, white w/brown streaks (66)
- 12"x12" floor tile, cream w/olive specks (71)
- 12"x12" floor tile, tan w/brown streaks (74)
- black lab top (96)
- black lab sink (97)
- fume hood lining (98)
- floor tile under carpet (assumed) (102)
- debris (108)
- debris (assumed) (108.5)
- soft, tan spray-on fireproofing (109)
- cream w/tan & grey specks linoleum (111)
- white fibrous duct insulation (112)
- canvass vibration joint (113)

The following suspect materials tested none detected (ND) as ACM in the building:

- <4" fiberglass w/tar PI (7)
- <4" fiberglass PI (9)
- 4"-8" fiberglass w/tar PI (17)
- 4"-8" fiberglass PI (19)
- 4"-8" fibrous PFI on fiberglass line (20)
- 9"-14" fiberglass PI (23)
- black foam PI (25)
- 4"-8" styrofoam PI (26)
- <4" styrofoam PI (28)
- <4" PFI on styrofoam line (29)
- ceramic tile mortar (30)
- fiberglass duct insulation (31)
- ceiling plaster (34)
- wall plaster (35)
- red brick mortar (36)
- clay tile mortar (37)
- concrete block mortar (38)
- sheetrock and taping compound (39)
- baseboard adhesive (40)
- 9"x9" floor tile, tan w/cream & brown streaks (48)
- floor tile adhesive (48.5)
- 9"x9" floor tile, golden brown w/brown streaks (52)
- floor tile adhesive (52.5)
- 12"x12" floor tile, cream w/brown blotches (60)
- 12"x12" floor tile, cream w/multi-color splotches (61)
- 12"x12" floor tile, cream w/grey blotches (64)
- floor tile adhesive (64.5)
- 12"x12" floor tile, tan w/gold & brown (65)
- floor tile adhesive (65.5)
- 12"x12" floor tile, grey w/tan & olive specks (67)
- 12"x12" floor tile, cream w/tan & salmon specks (68)
- floor tile adhesive (68.5)
- 12"x12" floor tile, grey w/tan & beige specks (69)
- floor tile adhesive (69.5)
- 12"x12" floor tile, tan grey cream marble (70)
- floor tile adhesive (70.5)
- 12"x12" floor tile, white w/olive & salmon specks (72)
- floor tile adhesive (72.5)
- 12"x12" floor tile, cream w/olive swirls (73)
- floor tile adhesive (73.5)
- 12"x12" floor tile, grey w/white & brown specks (75)
- floor tile adhesive (75.5)
- 12"x12" ceiling tile, fissured (80)
- ceiling tile adhesive (80.5)
- 2'x2' ceiling tile, pitted (81)
- 2'x2' ceiling tile, nailhole/pinhole (82)
- 2'x2' ceiling tile, pinhole/chicken scratch (83)
- 2'x2' ceiling tile, bumpy pencilhole (84)
- 2'x2' ceiling tile, pinhole/wormhole (85)
- 2'x2' ceiling tile, white textured (86)
- 2'x2' ceiling tile, white (87)
- 2'x2' ceiling tile, pinhole/pencilhole (88)
- 2'x2' ceiling tile, crevassed (89)
- 2'x4' ceiling tile, pinhole/fissured (90)
- 2'x4' ceiling tile, pitted (91)
- 2'x4' ceiling tile, pinhole/wormhole (92)
- 2'x4' ceiling tile, pinhole/chicken scratch (93)
- 2'x4' ceiling tile, partitioned pinhole/chicken scratch (94)
- sink undercoating (104)
- troweled plaster (105)
• carpet mastic (106)
• floor jack mastic (107)
• cream w/tan & brown streaks linoleum (110)
• linoleum adhesive (110.5)
• linoleum adhesive (111.5)
• dark brown caulking (114)
• soft, brown spray-on fireproofing (115)

The following non-friable with low potential to become friable materials tested positive as ACM:

• floor tile adhesive (assumed) (41.5, 42.5, 43.5, 44.5, 45.5, 46.5, 47.5, 49.5, 50.5, 51.5, 53.5, 54.5, and 102.5)
• floor tile adhesive (60.5, 61.5, 62.5, 66.5, 74.5)
• galbestos (assumed) (101)
• pipe putty (103)

The following friable material tested <1% asbestos:

• tan spray-on fireproofing (hard) (33)
• floor tile adhesive (67.5)

For room locations of above noted materials, refer to Appendices. Sample numbers of the above materials are located in the parenthesis following the sample descriptions.

Observations and Recommendations:

1.0 Department of Environmental Health & Safety (DEHS):

Please refer to condition assessments for specific damaged areas. In general, materials were found to be in good shape and do not pose significant health concerns to the building occupants.

2.0 Facilities Management:

Please refer to the floor plans included with this report for room numbers. The floor plans indicate the room numbers used in this survey.

The following rooms were not accessible at the time of the survey: M3, M30, M105/M105A, M105B, M109A, M120, M120A, M126, M126A, M141-1, M144, M144A, M147, M147A, M148, M148A, M149, M149A, M150, M150A, M151, M151A, M152, M152A, M217, M225, M247, M247A, M309, M345, M406, M406A, M409, and M421A. In addition, elevator #22 and elevator shafts #1, #2, and #22 (see floor plans), wall hatches in Room M10, M211A, M321, M421, and Hall M302-M328, and the areas above the ceilings in Rooms M10V, M104, M106, M110B, M112, M113, M114, M115, M117, M119D, M121, M123, M128, M128A, M131, M133, M136, M136A, M140-1, M140-2, M141-2, M145, M145A, M146, M146A, M201, M239, M309, M339, M501, the 1st floor entry, the 2nd floor south elevator lobby, and Hall M109A were not accessible. As discussed above, limited asbestos building surveys of Masonic Cancer Center have previously been performed. In Appendices I and II, areas designated with an (*) following the location contain information from the previous surveys. If abatement of these areas has taken place since it had been surveyed, the contents and quantities may have changed. Those areas which were not accessed during this survey or previous surveys should be entered and surveyed by certified personnel at the time of any renovation or demolition activities and where contained abatement would need to be performed. Observations and sampling should be performed by certified personnel to determine if asbestos-containing materials are located in those areas.
The asbestos-containing spray-on fireproofing (sample 109), located above the ceiling on the 4th floor, is delaminating and has fallen onto the ceiling tile (sample 108). Other debris from pipe insulation and/or spray-on fireproofing (sample 108.5) was observed above the ceilings throughout the remainder of the building. This debris was assumed to be asbestos-containing since samples could not be collected due to access above the ceiling, the location of the debris, and the location of mechanical equipment. All debris should be cleaned up and it is recommended that the areas be sprayed with an encapsulant. Access above the ceilings should be controlled until remediation is completed. Contact Facilities Management's Asbestos Coordinator Tim Nelson if these remediation techniques wish to be examined further.

The area above the ceiling on the 4th floor is open and, therefore, was surveyed as one homogeneous area. On the basement level and the 1st, 2nd, 3rd, and 5th floors, areas above the ceiling which were connected by open spaces were also considered to be homogeneous.

Based on the age of the building, the 9"x9" floor tiles and associated mastics located in the building are assumed to be asbestos-containing (except for samples 48 (48.5) and 52 (52.5)).

Cloth-covered wires were observed in Room M128 and in a wall hatch in Hall M3-M25. The wire covering was not sampled because it could not be determined if the wires were active. This material should be sampled and analyzed prior to any demolition or renovation activities which may impact the material.

A wall hatch located on the basement level in the south elevator lobby leads to an adjacent building and, therefore, was not surveyed.

The north half of the 1st floor was under renovation at the time of this survey. The ceiling was ripped open in the following rooms in this area: M107, M109, M119A, M119C, M125, M127, M135. In addition, the ceiling was also ripped open in the following hallways: M104-M109, M115-M147, and M148-M152 (see floor plan).

Analytical results indicate that the following material had mixed results (both positive and negative results for asbestos): floor tile adhesive (sample 61.5). This material needs to be considered asbestos-containing; however, project specific sampling can be performed prior to any work performed on this material.

Based upon analysis, a spray-on fireproofing (sample 33) and a floor tile adhesive (sample 67.5) were determined to contain less than one percent (<1%) asbestos (see Appendix I of the report). The current Occupational Safety and Health Administration (OSHA) definition of a non-regulated asbestos material is anything that contains less than one percent (<1%) asbestos by area.

All quantities in this survey are estimations and should not be considered exact measurements when used on abatement bids.

3.0 General:

No roofing sampling was done in conjunction with this survey; however, a limited survey of the Masonic Cancer Center roof was previously conducted. In Appendices I and II, the roof is designated with an (*) indicating the information was obtained from the previous survey. If abatement of the roof has taken place since it had been surveyed, the contents and quantities may have changed.

Due to limited access points, some spaces above ceilings were completely inaccessible or only slightly visible. In addition, the size and layout of mechanical equipment and/or duct work limited visibility. Laboratory equipment limited visibility in some laboratories. As a result, the quantities listed reflect the visibility available at the time of the survey.
The floor tiles and mastics under carpet that were assumed to be asbestos-containing were either inaccessible to sampling or unidentifiable. The floor tile and mastic under carpet should be sampled prior to being disturbed. DEHS suggests three samples of miscellaneous materials be taken and analyzed in accordance with OSHA regulations.

**Cost Information:** The approximate cost for the removal of all ACM is itemized below. These figures are based on the assumption that all friable and potentially friable ACM are going to be removed. For project specific removal costs, contact this office with your project requirements and unit costs can be calculated for the impacted areas.

<table>
<thead>
<tr>
<th>MATERIAL TYPE</th>
<th>LOW RANGE</th>
<th>HIGH RANGE</th>
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<tbody>
<tr>
<td>• thermal system insulation</td>
<td>$234,523</td>
<td>$304,418</td>
</tr>
<tr>
<td>• floor coverings and adhesives</td>
<td>$75,367</td>
<td>$150,734</td>
</tr>
<tr>
<td>• spray-on fireproofing</td>
<td>$225,638</td>
<td>$369,225</td>
</tr>
<tr>
<td>• debris</td>
<td>$250,472</td>
<td>$250,472</td>
</tr>
<tr>
<td>• miscellaneous materials</td>
<td>$29,358</td>
<td>$50,122</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$815,358</strong></td>
<td><strong>$1,124,971</strong></td>
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All ACM removal must be performed by a Minnesota licensed asbestos abatement contractor. All asbestos removal shall be performed within the specified procedures as outlined in the University of Minnesota Technical Specification for Asbestos Abatement. Please note that removal costs are highly variable and dependent on such factors as contractor availability, accessibility of work areas and site specific work plans.

Air monitoring is required for many asbestos-related projects. Environmental Health and Safety (EH&S) is available to provide this service. The estimated cost for EH&S to complete air monitoring requirements for specific projects will be made available upon request. The cost of air monitoring is a function of contractor on-site days and may vary dependent upon project specific scope of work. EH&S will provide labor, equipment and project oversight as necessary. Project management and contract administration will be provided by the Facilities Management Project Development Group.

EH&S also recommends that throughout the general renovation activities associated with this building, precautions and work practices should be implemented to minimize nuisance dust levels. Dust suppression techniques (misting the air with water and keeping materials wet) should be required of the general contractor.

At the time of renovation and/or demolition, any areas where contained abatement would need to be performed and those areas not having been accessed during this survey should be entered and surveyed by certified personnel. In the case this may constitute an uncontrolled abatement procedure DEHS would suggest nine samples of surfacing materials and at least three of thermal or miscellaneous materials be taken and analyzed to be considered non-asbestos containing material in accordance with OSHA regulations.

In accordance with OSHA regulations, areas which contain asbestos materials are required to be labeled at the access points (i.e. the outside of mechanical rooms, etc.)

If there is any further information required, or other questions arise regarding this request, please contact Kelly Brown at 626-2317.