April 3, 1996

REPORT:  Full Building Survey

TO:  Keith Passow, Manager Facilities Management Zone 6, 16 Architecture Building
     Tim Nelson, Facilities Management's Asbestos Coordinator, 400 Shops

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

SUBJECT:  Asbestos Material Survey - Kolthoff Hall
          EH&S Project No: 122-96-004
          Client Project No: for database

Scope of Work:  A full building asbestos material survey was conducted from January 16, 1996 through
March 7, 1996.  The purpose of the survey was to identify asbestos-containing materials (ACM) as defined
by the Environmental Protection Agency (EPA).  Any material that is greater than 1% asbestos is
considered to be ACM.  The intent of the survey was to identify both friable and nonfriable suspect ACM,
identify nonfriable ACM that may become friable under demolition or renovation conditions, and
to provide approximate cost estimates for the removal of identified ACM prior to any renovation of
Kolthoff Hall.

Project Description:  Two hundred sixty-seven (267) bulk samples of suspect ACM were collected on-site
and two hundred twenty (220) were analyzed via polarized light microscopy (PLM) by Milan 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.

The following friable or potentially friable materials tested positive as ACM:

- <4" white fibrous pipe insulation (PI) (1)
- <4" pipe fitting insulation (PFI) on white fibrous (2)
- <4" fibrous PFI on FG (10)
- 4"-8" white fibrous PI (11)
- 4"-8" PFI on white fibrous (12)
- 4"-8" fibrous PFI on FG (20)
- 9"-14" white fibrous PI (21)
- 9"-14" PFI on white fibrous (22)
- 9"-14" fibrous PFI on FG (24)
- pipe insulation debris (27)
• white fibrous tank (32)
• soft ceiling material (33)
• wall plaster (35)
• 9"x9" tan w/brown & off-white mottling FT (43)
• 9"x9" grey w/white & black streaks FT (44)
• 9"x9" grey w/white streaks & black speckles FT (48)
• 12"x12" tan w/grey white brown streaks FT (77)
• grey lab top (128)
• black lab top (131)
• transite (133)
• fibrous gasket (143)
• white sink undercoating (144)
• >14" fibrous PFI on FG (151)

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

• <4" fiberglass w/tar PI (7)
• <4" fibrous PFI on FG w/tar (8)
• <4" FG PI (9)
• 4'-8" fiberglass w/tar PI (17)
• 4'-8" fibrous PFI on FG w/tar (18)
• 4'-8" fiberglass PI (19)
• 9'-14" fiberglass PI (23)
• black foam PI (25)
• 4'-8" pink PFI (26)
• troweled-on plaster (28)
• 4'-8" pink FG PI (29)
• fiberglass duct insulation (31)
• ceiling plaster (34)
• red brick mortar (36)
• buckle block mortar (38)
• sheetrock and taping compound (39)
• baseboard adhesive (40)
• 9"x9" light grey w/white & black mottling FT (42)
• 9"x9" white, grey, & tan marble FT (45)
• 9"x9" white w/black streaks FT (46)
• floor tile adhesive (sample 46) (46.5)
• 9"x9" tan w/white streaks FT (47)
• 12"x12" light grey w/white & black mottling FT (71)
• 12"x12" light grey w/white & brown streaks FT (72)
• 12"x12" dark grey w/white & grey scribbles FT (73)
• 12"x12" grey w/white streaks FT (74)
• 12"x12" off-white w/grey & yellow mottling FT (75)
• 12"x12" white w/black scribbles FT (76)
• floor tile adhesive (sample 77) (77.5)
• 12"x12" black w/white streaks FT (78)
• floor tile adhesive (sample 78) (78.5)
• 12"x12" nailhole/pinhole CT (101)
• 2"x2" white pinhole/knifehole CT (110)
• 2"x2" pinhole fissure CT (111)
• 2"x4" nailhole/pinhole CT (120)
• 2"x4" white CT (122)
• <4" pink PFI (124)
• 1'x3' cork wallboard w/tar (125)
• cement/vermiculite board (126)
• wood board adhesive (127)
• metal-covered asbestos free PI (129)
• canvas vibration joint (130)
• black lab sink (132)
• grey duct putty (136)
• ceramic tile mortar (139)
• white hood lining (140)
• gold foam wall insulation (145)
• wood fiber wall panel (146)
• >14" PG PI (147)
• rubber vibration joint (148)
• tan pebble linoleum (152)
• linoleum adhesive (sample 152) (152.5)
• black foam wall insulation (154)
• foam wall insulation adhesive (sample 154) (155)
• 12"x12" tan w/dark grey & white streaks (156)
• floor tile adhesive (sample 156) (156.5)

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

• floor tile adhesive (41.5, 42.5, 43.5, 44.5, 45.5, 47.5, 48.5, 70.5, 71.5, 72.5, 73.5, 74.5, 75.5, 76.5)
• wallboard adhesive (sample 125) (125.5)
• galbestos (134)
• sink undercoating (135)
• tan duct putty (138)
• black tar under hood (141)
• wall tar (149)
• tar pipe wrap (150)
• white pipe wrap (153)

The following friable or potentially friable materials tested as less than one percent (<1%) asbestos:

• 9"x9" grey w/white streaks FT (41)
• 12"x12" grey w/white & black streaks FT (70)

The following nonfriable with low potential to become friable materials tested as <1% asbestos:

• white duct putty (142)

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. Department of Environmental Health & Safety (DEHS)
Please refer to condition assessments for specific damaged areas. In general, materials were found to be in good to excellent shape and do not pose significant health concerns to the building occupants.
2. Facilities Management;
Debris from asbestos-containing pipe insulation was observed on top of ceiling tiles located in the hallways on the Plaza Level, 1st floor, 2nd floor, 3rd floor, and 4th floor. It is recommended the area above the ceiling tiles in these areas be treated as controlled access areas until which point they can be cleaned of the debris. Following a clean-up of the visible debris by the Facilities Management Asbestos Abatement Unit or a Minnesota Licensed asbestos abatement contractor, it is recommended that the area be sprayed with an encapsulant. Contact Facilities Management's Asbestos Coordinator Tim Nelson if these remediation techniques wish to be examined further.

The findings of the survey indicated mixed results for the following materials:
- <4" white fibrous pipe insulation (PI) (1)
- <4" pipe fitting insulation (PFI) on white fibrous (2)
- <4" fibrous PFI on FG (10)
- 9"-14" fibrous PFI on FG (24)
- wall plaster (35)
- floor tile adhesive (sample 42) (42.5)
- floor tile adhesive (sample 44) (44.5)
- floor tile adhesive (sample 70) (70.5)
- floor tile adhesive (sample 71) (71.5)
- floor tile adhesive (sample 74) (74.5)
- floor tile adhesive (sample 75) (75.5)
- floor tile adhesive (sample 76) (76.5)
- black lab top (131)
- fibrous gasket (143)
- wall tar (149)
- tar pipe wrap (150)

These materials should be addressed on an "as needed" basis whenever they will be disturbed by renovation or demolition activities.

3. General;
At the time of the survey, the following areas were inaccessible: Room S142A, Room S194, Room 550, Room 650, elevator shafts, and above the ceiling tiles in Room 70(hallway east). In addition, two wall hatches located in the north hallway of the Basement Level were inaccessible (see Appendix I of the report).

Due to limited access points in the ceilings and walls, some pipe chases and interstitial spaces were completely inaccessible or only slightly visible. As a result, the quantities listed reflect the visibility available at the time of the survey.

Due to limited access points in the ceiling, the areas above the ceiling tiles in Room S138, Room S139, Room S140, and the Basement Level(hallway northwest) were only slightly visible. As a result, the quantities listed reflect the visibility available at the time of the survey.

Due to the configuration of lab benches, there is a potential that asbestos-containing pipe insulation may be located behind the lab benches which were not visible during this survey. As a result, the quantities listed reflect the visibility available at the time of the survey.

Although no roofing sampling was done, complete roof sampling is recommended at a time when a qualified roofing contractor is on-site to patch core sample holes in roofing.

The current Occupational Safety and Health Administration definition of a non-regulated asbestos material is anything that contains less than one percent (<1%) asbestos by area.
Several materials were analyzed as containing less than one percent (<1%) asbestos (see Appendix I of the report). Though these materials are not regulated by MDH or EPA, proper operations and maintenance procedures must be followed to meet OSHA guidelines. OSHA defines any material containing 0.1% asbestos as a potential hazard to worker safety. As with any dust creating activity, precautions and work practices should be implemented to minimize nuisance dust levels. Dust suppression techniques (misting the air with water and keeping materials wet during general construction activities) should be required of the general contractor.

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

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>
</tr>
</thead>
<tbody>
<tr>
<td>• thermal system insulation</td>
<td>583,579</td>
<td>743,944</td>
</tr>
<tr>
<td>• floor tile &amp; adhesive</td>
<td>206,109</td>
<td>412,218</td>
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<tr>
<td>• wall plaster</td>
<td>19,530</td>
<td>30,380</td>
</tr>
<tr>
<td>• galbestos</td>
<td>10,576</td>
<td>21,152</td>
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<tr>
<td>• transite</td>
<td>45,045</td>
<td>67,568</td>
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<tr>
<td>• soft ceiling material</td>
<td>57,750</td>
<td>94,500</td>
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<tr>
<td>• pipe insulation debris</td>
<td>962</td>
<td>1,040</td>
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<tr>
<td>• wallboard adhesive</td>
<td>520</td>
<td>1,040</td>
</tr>
<tr>
<td>• sink and hood undercoatings</td>
<td>164</td>
<td>328</td>
</tr>
<tr>
<td>• tan duct putty</td>
<td>140</td>
<td>280</td>
</tr>
<tr>
<td>• fibrous gasket</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>• wall tar</td>
<td>2,300</td>
<td>4,600</td>
</tr>
<tr>
<td>• lab tops</td>
<td>50,195</td>
<td>75,292</td>
</tr>
</tbody>
</table>

TOTAL                        | 976,890   | 1,452,382  

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

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