August 19, 1996

REPORT: Full Building Survey

TO: Tim Nelson, Facilities Management's Asbestos Coordinator, 400 Donhowe Building
Ben Ystenes, Manager, Zone 5, Facilities Management, 19 Scott Hall

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 - Appleby Hall
EH&S Project No: 037-96-080
Client Project No: for database

Scope of Work: A full building asbestos material survey was conducted on July 22, 1996 through August 6, 1996. 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 Appleby Hall.

Project Description: One hundred sixty-eight (168) bulk samples of suspect ACM were collected on-site and one hundred forty-nine (149) 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.

The following friable or potentially friable materials tested positive as ACM in the building:

- <4" felt w/tar pipe insulation (PI)(5)
- <4" fibrous pipe fitting insulation (PFI) on felt w/tar line (6)
- <4" fibrous PFI on FG w/tar line (8)
- 9"x9" floor tile, white w/black streaks (41)
- 9"x9" floor tile, grey w/black & white streaks (43)
- sink undercoating (114)
- fire door (assumed) (101)
- galbestos (assumed) (116)
- floor tile under carpet (assumed) (121)
The following suspect materials tested none detected (ND) as ACM in the building:

- <4" white fibrous PI (1)
- <4" fibrous PFI on white fibrous line (2)
- <4" fiberglass PI w/tar (7)
- <4" fiberglass PI (9)
- 4"-8" fiberglass PI (19)
- 9"-14" fiberglass PI (23)
- black foam PI (25)
- fiberglass tank insulation (29)
- canvass covered fiberglass tank insulation (30)
- fiberglass duct insulation (31)
- ceiling plaster (34)
- wall plaster (35)
- red brick mortar (36)
- clay tile mortar (37)
- concrete block mortar (38)
- sheetrock & taping compound (39)
- baseboard adhesive (40)
- floor tile adhesive (41.5)
- 9"x9" floor tile, cream w/black streaks (42)
- floor tile adhesive (42.5)
- 12"x12" floor tile, beige brown white marble (60)
- floor tile adhesive (60.5)
- 12"x12" floor tile, white w/grey & black smears (61)
- floor tile adhesive (61.5)
- 12"x12" floor tile, tan olive brown marble (62)
- floor tile adhesive (62.5)
- 12"x12" floor tile, grey white brown marble (63)
- floor tile adhesive (63.5)
- 12"x12" floor tile, white w/brown spots (64)
- floor tile adhesive (64.5)
- 12"x12" floor tile, grey white grey marble (65)
- 12"x12" floor tile, grey w/white & black specks (66)
- floor tile adhesive (66.5)
- 12"x12" floor tile, light grey w/white grey marble (67)
- floor tile adhesive (67.5)
- 2'x2' ceiling tile, chicken scratch (84)
- 2'x4' ceiling tile, chicken scratch (90)
- canvass vibration joint (95)
- 8"x8" ceramic floor tile (96)
- troweled-on plaster (97)
- black lab sink (111)
- black styrofoam ceiling tile (117)
- carpet mastic (120)

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

- floor tile adhesive (43.5, 65.5, 121.5)
- black lab top (110)
- transite hood (113)
- grey duct chaulking (115)
- ceiling tile adhesive (117.5)
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.

Rooms 2D, M18, and 415B were not accessed at the time of the survey due to problems obtaining keys to these rooms. Room M18 is an electrical vault and limited observations were made through a window in the room. Areas which were not accessed during this survey, should be entered and surveyed by certified personnel prior to any renovation or demolition activities. Observations and sampling should be performed to determine if asbestos-containing materials are located in those areas.

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 addition to Appleby Hall (see attached floor plans) was not surveyed due the date of construction of the addition (1988).

Fume hoods located in Rooms 309 and 311 appear to be new and do not appear to contain suspect asbestos-containing materials.

The crawlspace in Appleby Hall was surveyed by DEHS personnel on February 22, 1995. Debris that was collected in the soil of the unexcavated portion of the crawlspace was found to be asbestos-containing. The crawlspace was demarcated in a manner as to alert persons who may have to work within the crawlspace of the possible dangers of disturbing the soil with asbestos debris. The crawlspace has been covered with a poly barrier; however, numerous tears have been made in the poly over time. Half-face respirators should be donned along with tyvek suits when persons are working in the crawlspace.

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

3.0 General:

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, or prior to roof removal or demolition.

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

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>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Cost 1</th>
<th>Cost 2</th>
</tr>
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<tbody>
<tr>
<td>thermal system insulation</td>
<td>$560</td>
<td>$712</td>
</tr>
<tr>
<td>floor coverings and adhesives</td>
<td>$32,696</td>
<td>$65,392</td>
</tr>
<tr>
<td>miscellaneous</td>
<td>$4,998</td>
<td>$7,505</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>$38,254</td>
<td>$73,609</td>
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</tbody>
</table>

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.

Written By:

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Reviewed By:
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