January 8, 1997

REPORT: Full Building Survey

TO: Tim Nelson, Facilities Management's Asbestos Coordinator, 400 Donhowe Building
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FROM: Kelly Brown, Asbestos Group, Environmental Health and Safety, W-140 Boynton
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SUBJECT: Asbestos Material Survey - McNeal Hall (Building 338)
          EH&S Project No: 338-96-109
          Client Project No: for database

Scope of Work: A full building asbestos material survey was conducted on September 18, 1996 through
December 20, 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 McNeal Hall.

Project Description: Four hundred four (404) bulk samples of suspect ACM were collected on-site and
three hundred ninety-one (391) 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 McNeal Hall were performed by Delta Environmental
Consultants on April 2, 1990 and November 29, 1990 and by University of Minnesota Facility Management
on July 25, 1994, April 2, 1996, and May 1, 1996. Information from these previous surveys is included as
part of this survey.

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" felt w/tar PI (5)
• <4" PFI on felt w/tar line (6)
• <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 felt w/tar line (16)
• 4"-8" fibrous PFI on fiberglass line (20)
• 9"-14" white fibrous PI (21)
• 9"-14" PFI on white fibrous line (22)
• 9"-14" fibrous PFI on fiberglass line (assumed) (24)
• cloth gasket (26)
• black pipe putty (28)
• tan duct putty (29)
• white fibrous tank (32)
• 9"x9" floor tile, black w/brown streaks (41)
• 9"x9" floor tile, dark olive w/black & tan streaks (42)
• 9"x9" floor tile, unknown color and pattern (assumed) (43)
• 12"x12" floor tile, white w/olive smears (61)
• 3"x3" floor tile, multi-colored (79)
• sink undercoating (94)
• black lab top (96)
• white fibrous insulation board (97)
• debris (98)
• transite (101)
• floor tile under carpet (assumed) (104)
• transite hood lining (111)
• gasket (112)
• floor putty (113)

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

• <4" fiberglass PI (9)
• 4"-8" felt w/tar PI (15)
• 4"-8" fiberglass PI (19)
• 9"-14" fiberglass PI (23)
• black foam (25)
• building divider putty (27)
• troweled plaster (30)
• fiberglass duct insulation (31)
• spray-on fireproofing (33)
• ceiling plaster (34)
• wall plaster (35)
• red brick mortar (36)
• clay tile mortar (37)
• concrete block mortar (38)
• floor tile adhesive (41.5)
• floor tile adhesive (42.5)
• 12"x12" floor tile, white w/tan streaks (60)
• 12"x12" floor tile, creme w/brown & white swirls (62)
• floor tile adhesive (62.5)
• 12"x12" floor tile, tan w/white specks (63)
• floor tile adhesive (63.5)
• beige & grey swirl linoleum (76)
• linoleum adhesive (76.5)
• floor leveling material (77)
• tan, yellow, & brown pebble linoleum (78)
• linoleum adhesive (78.5)
• floor tile adhesive (79.5)
• 12”x12” ceiling tile, fissured (80)
• ceiling tile adhesive (80.5)
• 12”x12” ceiling tile, rough textured (81)
• ceiling tile adhesive (81.5)
• 12”x12” ceiling tile, peghole (82)
• ceiling tile adhesive (82.5)
• tectum board ceiling tile (84)
• 2’x2’ ceiling tile, pinhole/chicken scratch (85)
• 2’x4’ ceiling tile, pinhole (90)
• 2’x4’ ceiling tile, pinhole/chicken scratch (91)
• 2’x4’ ceiling tile, pinhole/fissure (92)
• 2’x4’ ceiling tile, nailhole/pitted (93)
• carpet mastic (102)
• stair tread mastic (103)
• pyrobar block (105)
• black lab sink (106)
• fiberglass roof insulation w/tar (108)
• dust debris (109)
• yarn material (110)
• 4”-8” foam pipe insulation (114)
• pink cloth pipe wrap (115)
• fiberglass tank insulation (116)
• duct mastic (117)

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

• floor tile adhesive (43.5 (assumed), 60.5, 61.5, 104.5 (assumed))

The following nonfriable, with low potential to become friable, material tested <1% asbestos:

• sheetrock and taping compound (39)
• baseboard adhesive (40)

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 68F, 80B, and 233A and the north, south, and west elevator shafts were not accessible at the time of the survey. In addition, ceiling or wall hatches located in Rooms B8, 22, 225A, 440, and 485 were not accessible. Those areas which were not accessed during this survey 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.

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. Room B9A is no longer present. The floor plans included in this report shows this change.

Analytical results indicate that the following materials had mixed results (both positive and negative results for asbestos): <4" white fibrous pipe insulation (sample 1), <4" PFI on white fibrous line (sample 2), <4" fibrous PFI on fiberglass line (sample 10), 4"-8" white fibrous pipe insulation (sample 11), 4"-8" PFI on white fibrous line (sample 12), 4"-8" fibrous PFI on fiberglass line (sample 20), white fibrous tank insulation (sample 32), black lab top (sample 96), and debris (sample 98). Project specific sampling should be performed prior to any work performed on these materials.

Asbestos-containing debris was observed in the dirt throughout the two crawl spaces in the building. Half-face respirators need to be donned along with tyvek suits when persons are working in the crawl spaces. The crawl spaces are demarcated in a manner as to alert persons who may have to work within the crawl spaces of the possible dangers of disturbing the asbestos debris.

A 9"x9" floor tile and associated mastic (samples 43 and 43.5) located in a 3rd floor telcom closet and a 9"-14" fibrous PFI on fiberglass line located in a crawl space were assumed to be asbestos-containing because they were not accessible for samples to be collected.

Based upon analysis, sheetrock and taping compound (sample 39) and baseboard adhesive (sample 40) 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.

The white fibrous insulation board (sample 97) observed in Rooms 274, 278, and 475/475A/475B is located behind the heating registers within these rooms.

Due to the size and layout of mechanical equipment and duct work, only limited visibility was available in many of the mechanical rooms, ceiling hatches, and wall hatches.

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, some pipe chases and spaces above ceilings were completely inaccessible or only slightly visible. 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>$185,343</td>
<td>$231,681</td>
</tr>
<tr>
<td>• floor coverings and adhesives</td>
<td>$165,114</td>
<td>$330,228</td>
</tr>
<tr>
<td>• debris and dirt</td>
<td>$329,036</td>
<td>$382,600</td>
</tr>
<tr>
<td>• miscellaneous materials</td>
<td>$34,263</td>
<td>$50,628</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$713,756</strong></td>
<td><strong>$995,137</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.