Scope of Work: A full building asbestos material survey was conducted on September 20, 2001. 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 non-friable suspect ACM, identify non-friable ACM that may become friable under demolition or renovation conditions, and provide approximate cost estimates for the removal of identified ACM prior to renovation of the Veterinary Teaching Hospitals.

Project Description: Bulk samples of suspect ACM were collected on-site and analyzed via polarized light microscopy (PLM) 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”aircell PI (3)
- <4” fibrous PFI on air cell (4)
- <4” felt with mag & tar PI (5)
- <4” fibrous PFI on felt (6)
- <4” PFI on fiberglass (10)
- 4”-8” white fibrous PI (11)
- 4”-8” PFI on white fibrous (12)
- 4”-8” PFI on fiberglass (20)
- 9”-14” white fibrous PI (21)
- 9”-14” PFI on white fibrous (22)
- 9”-14” PFI on fiberglass (24)
- 4”-8” PFI on foam (26)
- white fibrous tank insulation (32)
- 9”x9” black w/tan floor tile (FT) (41)
- 9”x9” beige mottling FT (42)
• 9"x9" light grey w/charcoal & white FT (43)
• 9"x9" grey w/charcoal & white FT (44)
• 9"x9" tan w/cream & brown FT (45)
• 9"x9" grey w/cream FT (46)
• 9"x9" olive w/cream & dark olive FT (47)
• 9"x9" mocca w/brown & white FT (48)
• 9"x9" beige w/white FT (49)
• 12"x12" dark grey w/black & tan FT (60)
• 12"x12" beige w/dark beige & cream FT (61)
• 12"x12" black w/cream FT (62)
• 12"x12" white w/charcoal FT (63)
• 12"x12" off-white w/beige FT (65)
• 12"x12" beige w/brown & white FT (68)
• 12"x12" fudge marble FT (69)
• 12"x12" light green w/cream FT (70)
• 12"x12" tan w/beige & white FT (71)
• 12"x12" off-white w/olive FT (72)
• 12"x12" off-white w/green FT (73)
• 12"x12" dark beige w/beige & cream FT (75)
• 2’x4’ nailhole fissured indent ceiling tile (CT) (88)
• 2’x4’ pinhole worm ceiling tile (CT) (89)
• 2’x4’ pinhole fissured ceiling tile (CT) (91)
• 2’x4’ pinhole fissured textured ceiling tile (CT) (92)
• canvass vibration joint (93)
• black lab top (96)
• debris (97)
• galbestos (98)
• transite (101)
• sink undercoating (103)
• black tar paper duct coating (112)

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

• <4” fiberglass PI (9)
• 4”-8” fiberglass PI (19)
• 9”-14” fiberglass PI (23)
• 4”-8” foam PI (25)
• <4” foam PI mastic (27)
• 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 adhesives (46.5) (71.5) (74.5) (76.5) (77.5)
• 12”x12” off-white w/beige & dk. Beige marble FT (66)
• 12”x12” olive w/cream & beige FT (67)
• 12”x12” caramel granite FT (74)
• 12”x12” beige cream marble FT (76)
• 12”x12” off white w/gold FT (77)
• 12”x12” beige marble FT (78)
• 12"x12" beige w/white & rust streaks FT (79)
• 12"x12" pegboard ceiling tile (CT) (80)
• ceiling tile adhesive (80.5) (81.5) (82.5) (83.5)
• 12"x12" computerboard CT (81)
• 12"x12" fissured CT (82)
• 12"x12" random hole CT (83)
• 2'x2' pinpoint fissured CT (84)
• 2'x2' sheetrock CT (85)
• 2'x2' canvas FG CT (86)
• 2'x2' pinpoint CT (87)
• 2'x4' nailhole textured CT (90)
• 2'x4' pinpoint mini-crater CT (93)
• 2'x4' pinpoint/nailhole fissured CT (94)
• 2'x4' sheetrock CT (102)
• ceramic tile (104)
• stair cover Mastic (107)
• carpet mastic (108)
• black duct mastic (111)
• pipe putty (114)

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

• floor tile adhesives: (41.5) (42.5) (43.5) (44.5) (45.5) (47.5) (48.5) (49.5) (60.5) (61.5) (62.5) (63.5) (65.5) (66.5) (67.5) (68.5) (69.5) (70.5) (72.5) (73.5) (75.5) (78.5) (79.5)
• putty on metal duct (105)
• interior window caulking (106)
• concrete putty (115)
• exterior window caulking (116)

Observations and Recommendations: Due to limited access points in the ceilings and walls, some pipe chases, areas above ceilings and lab cabinets were completely inaccessible or only slightly visible. As a result, the quantities listed reflect the visibility available at the time of the survey.

It should be noted that no roof sampling was performed. 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.

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

Some building components such as doors and light fixtures were not tested since sampling would damage components. All building components or fixtures not listed in this survey need to be assumed positive for asbestos materials until tested. Verbal verification on certain components or fixtures might be obtained by contacting the Facilities Management's Hazardous Materials Program Manager (FMHPM).
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</td>
<td>$324,377</td>
<td>$428,253</td>
</tr>
<tr>
<td>Floor tile and adhesive</td>
<td>$65,886</td>
<td>$131,772</td>
</tr>
<tr>
<td>Ceiling tile</td>
<td>$30,258</td>
<td>$60,516</td>
</tr>
<tr>
<td>Lab top and transite</td>
<td>$14,045</td>
<td>$19,663</td>
</tr>
<tr>
<td>Misc.</td>
<td>$17,580</td>
<td>$27,270</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$452,146</strong></td>
<td><strong>$667,474</strong></td>
</tr>
</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. The Asbestos Group of the Facilities Management Hazardous Materials Program (FMHMP) is available to provide this service. The estimated cost for FMHMP 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. FMHMP will provide labor, equipment and project oversight as necessary. Project management and contract administration will also be provided by the FMHMP.

FMHMP 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 (mist the air with water and keeping materials wet) should be required of the general contractor.

Depending on demolition/remodeling plans it should be noted that fluorescent light ballasts, bulbs, mercury switches and electrical components need to be disposed of as hazardous waste and can be taken care of by contacting the FMHMPM.

If there is any further information required, or other questions arise regarding this request, please contact: Bryan Angstman at (612) 625-3345 or the FMHMPM Sean Gabor at (612) 625-7547.

Written By: [Signature]
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Approved By: [Signature]
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