July 5, 2007

REPORT: Full Building Survey

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SUBJECT: Asbestos Material Survey - Diehl Hall
EH&S Project No: 272-94-140
Client Project No: for database

Scope of Work: A full building asbestos material survey was conducted on August 24, through November 9, 1994. 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 Diehl Hall.

Project Description: Five hundred Thirty-three (533) bulk samples of suspect ACM were collected on-site and three hundred eighty-two (382) were analyzed via polarized light microscopy (PLM) by University of Minnesota Environmental Health & Safety Asbestos Group, and Twin City Engineering 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. A previous limited asbestos building survey was performed on the Diehl Hall by Delta Environmental Consultants on December 6, 1991. Information from the previous survey was 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" fibrous PFI on fiberglass w/ tar lines(8)
- <4" fibrous PFI on fiberglass lines(9)
- 4"-8" white fibrous PI (10)
- 4"-8" PFI on white fibrous line (11)
- 4"-8" fibrous PFI on fiberglass line w/ tar (17)
- 4"-8" fibrous PFI on fiberglass line (18)
- 9"-14" fibrous PI (19)
- 9"-14" fibrous PFI on fibrous PI (20)
- 9"-14" fibrous PFI on fiberglass PI (21)
- white fibrous tank insulation (22)
- spray-on fire proofing (white) (23)
- 9"x9" floor tile cream w/ olive streaks (31)
- 9"x9" floor tile, light brown w/ cream & brown streaks (32)
- 9"x9" floor tile, beige marble (33)
- 9"x9" floor tile, gray w/ olive & black (34)
- 9"x9" floor tile, tan w/ white & brown streaks (35)
- 9"x9" floor tile, tan w/ olive streaks (36)
- 9"x9" floor tile, white w/green streaks (37)
- 9"x9" floor tile, cream w/ brown & gray smears (39)
- 9"x9" floor tile, dark cream w/ brown & gray streaks (40)
- 9"x9" floor tile, gray w/ white streaks (41)
- 9"x9" floor tile, red w/ white streaks (42)
- 9"x9" floor tile, aqua w/ white & gray streaks (43)
- 9"x9" floor tile, cream w/ tan streaks (44)
- 9"x9" floor tile, brown w/ brown & white streaks (45)
- 12"x12" floor tile, beige marble (48)
- 12"x12" floor tile, tan w/ olive streaks (50)
- 12"x12" floor tile, cream w/ gold & olive streaks (54)
- 12"x12" floor tile, tan w/ brown & white streaks (55)
- 12"x12" floor tile, tan w/ brown & white holes(56)
- 12"x12" floor tile, cream w/ beige streaks (57)
- 12"x12" floor tile, light green w/ cream spots (58)
- 12"x12" floor tile, light green w/ cream & tan spots (59)
- 2'x2' ceiling tile, pinhole fissure (67)
- 2'x2' ceiling tile, pinhole wormhole (68)
- black lab top (75)
- galbestos ducting (76)
- transite (77)
- debris (thermal & spray-on) (78)
- duct insulation (79)
- 9"-14" cork w/ tar PI (81)
- 9"-14" PFI on cork w/ tar PI line (82)
- 4"-8" cork w/ tar PI (83)
- 4"-8" PFI on cork w/ tar PI line (84)
- tar on metal (85)
- gray putty (86)
- transite wall panel (87)
• tan pipe putty (88)
• transite hood (94)
• gray duct putty (95)
• oven insulation (96)
• sink undercoating (99)
• floor tile under carpet (103) (Inaccessible Assumed Positive)
• floor tile mastic (103.5) (Inaccessible Assumed Positive)
• tar on fiberglass insulation (104)
• 9"x9" floor tile, light brown w/ white & brown smears (105)
• 9"x9" floor tile, brown w/ brown & orange streaks (106)
• 9"x9" floor tile, white w/ tan swirls (107)
• 9"x9" floor tile, gray w/ dark gray & white streaks (108)
• 9"x9" floor tile, cream w/ beige specks (109)
• tan duct putty (114)
• brown pipe putty (115)
• mastic under carpet (116)
• stairway tread mastic (118)
• tan linoleum (119)
• white woolly spray-on (122)
• white caulking (123)
• 12"x12" floor tile, mint chocolate chip (130)
• 12"x12" floor tile, cream w/ tan streaks (131)
• 12"x12" floor tile, cream w/ olive specks (132)
• 12"x12" floor tile, gray w/ black & white specks (134)
• 12"x12" floor tile, gray w/ black & white specks (136)
• 12"x12" floor tile, tan marble w/ square pattern (140)
• 9"x9" floor tile, white w/ black streaks (144)
• 12"x12" floor tile, tan w/ white & dark marble streaks (145)
• 9"x9" floor tile, cream w/ green streaks (147)
• wall tar (150) (Inaccessible Assumed Positive)
• 2’x4’ ceiling tile, pinhole fingernail hole (151) (Inaccessible Assumed Positive)
• 9"x9" floor tile, cream w/ yellow & brown streaks (154)
• 12"x12" ceiling tile, pinhole fissure (155) (Inaccessible Assumed Positive)
• ceiling tile adhesive (155.5) (Inaccessible Assumed Positive)
• vinyl floor covering gray & brown mosaic (160)
• 9"x9" floor tile, dark brown w/ red & white streaks (162)
• 9"x9" floor tile, chocolate w/ dark brown & white streaks (163)
• 2’x2’ wall pegboard (164)
• <4’ PFI on cork w/ tar PI line (171)
• 12"x12" floor tile, salmon w/ gray & white specks (174)
• black insulation (175)

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

• <4” fiberglass w/ tar PI (7)
• 4”-8” fiberglass w/ tar PI (16)
• ceiling plaster (24)
• wall plaster (25)
• red brick mortar (26)
• concrete block mortar (28)
• sheet rock and taping compound (29)
• baseboard adhesive (30)
• 9”x9” floor tile light yellow w/ brown & white streaks (38)
• 12"x12" floor tile, cranberry chutney (46)
• 12"x12" floor tile, gray w/ gray, black & white specks (47)
• 12"x12" floor tile, white w/ black & gray specks (49)
• 12"x12" floor tile, tan w/ white & olive specks (51)
• 12"x12" floor tile, cream w/ brown & white streaks (52)
• 12"x12" floor tile, tan w/ blue & white specks (53)
• 12"x12" floor tile, cream w/ tan swirls (60)
• floor tile mastic (38.5, 42.5, 45.5, 60.5)
• 12"x12" ceiling tile, deep fissure (61)
• ceiling tile mastic (61.5)
• 12"x12" ceiling tile, cream small/ large fissure (62)
• ceiling tile mastic (62.5)
• 12"x12" ceiling tile, small/ large wormhole fissure (63)
• ceiling tile mastic (63.5)
• 12"x12" ceiling tile, pencil hole (64)
• ceiling tile mastic (64.5)
• 12"x12" ceiling tile, pencil hole / nail hole (65)
• 2'x2' ceiling tile, pinhole nail hole (66)
• 2'x4' ceiling tile, pencil hole wormhole (69)
• 2'x4' ceiling tile, pinhole fissure (70)
• 2'x4' ceiling tile, pinhole wormhole (71)
• 2'x4' ceiling tile, pattern pencil hole (72)
• 2'x4' ceiling tile pattern pencil hole pinhole (73)
• ceramic tile mortar (80)
• 9"-14" cork w/ tar PI (81)
• black lab sinks (89)
• fiberglass duct insulation w/ tar batting (90)
• blue spray-on fireproofing (91)
• red duct putty (92)
• black mastic on pipe (93)
• red caulking (101)
• fiberglass insulation w/ tar threads (102)
• 2'x4' ceiling tile, random pinhole pencil hole (110)
• 2'x2' ceiling tile, random pinhole pencil hole (111)
• 2'x4' ceiling tile, chicken scratch pinhole (112)
• cork board mastic (113)
• troweled on spray-on (117)
• 12"x12" ceiling tile patterned pencil hole (120)
• ceiling tile adhesive (120.5)
• yellow brick mortar (121)
• 12"x12" floor tile, gray marble (133)
• 12"x12" floor tile, yellow brown (135)
• 12"x12" floor tile, white & tan marble (137)
• 12"x12" floor tile, cream w/ tan spots (138)
• 9"x9" floor tile, cream w/ red & yellow streaks (139)
• 12"x12" floor tile, gray w/ gray white & blue (141)
• 12"x12" floor tile, cream w/ red & brown streaks (142)
• 12"x12" floor tile, egg salad w/ mustard (143)
• 12"x12" floor tile, cream w/ tan & gray marble (146)
• 12"x12" floor tile, cream w/ olive & white streaks (149)
• 2'x2' ceiling tile, rough textured surface (152)
• 2'x4' ceiling tile, fiberglass (153)
• vinyl floor adhesive (160.5)
• 12"x12" floor tile, tan, black & brown specks (161)
• 9"x9" floor tile, gray w/ black & white streaks (165)
• <4" cork w/ tar PI (170)
• tar paper on insulation (172)
• 9"x9" floor tile, gray w/ dark gray & white streaks (173)
• floor tile mastic (108.5, 133.5, 138.5, 140.5, 141.5, 144.5, 146.5, 147.5, 149.5, 161.5, 162.5, 165.5, 173.5)
• white duct putty (176)
• blue duct putty (177)

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

• floor tile mastic (31.5, 32.5, 33.5, 34.5, 35.5, 36.5, 37.5, 39.5, 40.5, 41.5, 43.5, 44.5, 46.5, 47.5, 48.5, 49.5, 50.5, 51.5, 53.5, 54.5, 55.5, 56.5, 57.5, 58.5, 59.5, 105.5, 106.5, 107.5, 109.5, 130.5, 131.5, 132.5, 134.5, 135.5, 136.5, 137.5, 142.5, 143.5, 145.5, 154.5, 174.5)
• ceiling tile mastic (65.5)

The following material tested less than 1% asbestos:

• clay tile mortar (27)
• floor tile mastic (52.5)

For room locations of above noted materials, refer to Appendices.

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 (except where noted) and do not pose significant health concerns to the building occupants. Facilities management personnel indicated that pipe insulation marked with a red "X" had been sampled and identified as asbestos containing materials.

2. Facilities Management:

In the Appendices, material descriptions followed by a date refer to samples referenced from previous surveys conducted by Delta Environmental Consultants or by the Department of Environmental Health & Safety. The date refers to the original sampling date.

Two materials were analyzed as containing less than one percent (<1%) asbestos. Please refer to the tables for the materials which have been identified with less than one per-cent. These materials are not regulated by MDH, EPA, or by current OSHA regulations 29CFR 1926.1101.

The suspect materials that were analyzed and found to contain trace amounts of asbestos do not meet the strict definition of asbestos containing materials. However, 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.
Asbestos containing debris (white spray-on & thermal system insulation) was identified above the ceiling throughout the building. See tables for quantities and specific locations.

Spray-on fireproofing debris was found on the majority of suspended ceiling tiles on the fifth and sixth floors. It is recommended the areas above the ceiling tiles be treated as controlled access areas until which point they can be cleaned of spray-on debris.

Blue spray-on fireproofing was observed above Hallway 668-677 and above Rooms: 680, 680A, 680B, 682, 682A, 684, 684A, 686, 687. Analysis of samples identified a white spray-on friable asbestos-containing material in three of the seven samples. Remnants of the white spray-on can be found in locations where ducts and/or pipes were removed since the abatement of the white spray-on material. In addition, overspray of the asbestos-containing spray-on fireproofing was observed above the ceiling tiles on electrical conduit, concrete decking and duct work. Due to the presence of suspect dust on the ceiling tile and the possibility of delamination of the spray-on, proper Operation & Maintenance (O & M) procedures should be followed whenever working on or above the ceiling tiles.

Blue spray-on fireproofing was tested and found not to contain asbestos. All other spray-on fireproofing material is considered asbestos containing.

In addition, overspray of the asbestos containing spray-on fireproofing was observed above the ceiling tiles on electrical conduit, concrete decking and duct work. Due to the presence of suspect dust on the ceiling tiles and the possibility of delamination of the spray-on, proper Operation & Maintenance (O&M) procedures should be followed whenever working on or above the ceiling tiles.

Spray-on insulation located in Room J-140 (sample #122) contains asbestos. According to maintenance personnel in Diehl Hall the ceiling was previously covered with an asbestos containing spray-on which was removed in the early 1980's. The current spray-on was then applied to the ceiling as a replacement and reportedly was non-asbestos containing material.

Asbestos-containing ceiling tiles (sample #'s 67 & 68) were identified in the following areas: Rooms 229, 243, Hall 243-267, 501-504, 511, 620, 620A, 620B, 675. Proper Operation & Maintenance (O&M) procedures should be followed whenever working on or above these ceiling tiles.

In Rooms 525A, 525B, 525C, 525D, 525E, 525G, and 511A carpeting is covering the asbestos-containing floor tile. This should be noted in case the carpeting is removed during the proposed renovation project. If the floor tile comes up with the carpet, the carpet should then be removed by the Facilities Management Asbestos Abatement Unit or a Minnesota Licensed asbestos abatement contractor.

Areas in the library on the fifth floor were not accessed due to controlled access of valuable book storage and strong opposition by library personnel. Observations were not performed above the ceiling in rooms 565A, 568, 595, 597, 598, and 598A due to storage of valuable books. Two ceiling tile types, 2x4' pinhole, fingernail hole, (sample #151), and 12"x12" pencil holed fissured (sample #155, #155.5), located in this area were not sampled. These ceiling tiles were only located in this area of the building. Before accessing areas above the ceiling in these rooms, it is suggested an asbestos survey be completed. It is known from previous work that asbestos-containing fireproofing is in place above the ceiling tile.

Library personnel should be consulted prior to the planning of any demolition, removal or remodeling of materials which is to take place in the above mentioned rooms. In addition, observations sampling and analysis of materials is recommended prior to any disturbance of these materials.
Wall tar (sample #150) was observed in a wall hatch in Room 501. The material was not accessible for sampling due to the small size of the wall hatch. This material is assumed to contain asbestos and should be analyzed prior to be disturbed.

Room 605 is a large walk-in incubator and was not accessed at the time of the survey. Limited observations were however performed through a small window. No suspect asbestos-containing material was observed.

3. General:

Observations were not performed in Room J122 (infectious disease Lab), freezer rooms G133 & G133 and Room 285, 648B. These areas were not accessible at the time of the survey.

Although no roof 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 were completely inaccessible or only slightly visible. As a result, the quantities listed reflect the visibility available at the time of the survey.

Floor tile sample 105 was collected from the stair landing from the central library stairway (Room 350) in Diehl Hall. Due to the location, the heavy traffic and the small area of tile #105, the tile was sampled without the adhesive.

The floor tiles and mastics under carpet (sample #103, 103.5) that were assumed to be asbestos containing were either inaccessible to sampling or unidentifiable. If floor tile under carpet is to be disturbed in the future, it should be assumed to contain asbestos until sampling can be done.

**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>$693,471</td>
<td>$892,872</td>
</tr>
<tr>
<td>• floor coverings &amp; mastic</td>
<td>$239,582</td>
<td>$479,164</td>
</tr>
<tr>
<td>• spray-on</td>
<td>$543,026</td>
<td>$888,588</td>
</tr>
<tr>
<td>• miscellaneous mastics &amp; putties</td>
<td>$51,700</td>
<td>$103,400</td>
</tr>
<tr>
<td>• transite hoods etc.</td>
<td>$47,170</td>
<td>$84,906</td>
</tr>
<tr>
<td>• ceiling tile</td>
<td>$15,288</td>
<td>$30,576</td>
</tr>
<tr>
<td>• debris</td>
<td>$6,142</td>
<td>$6,142</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$1,596,379</strong></td>
<td><strong>$2,485,648</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. 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.

If there is any further information required, or other questions arise regarding this request, please contact Dale Livingston at 627-4886.

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