April 15, 1997

REPORT: Full Building Survey

TO: Tim Nelson, Facilities Management’s Asbestos Coordinator, 400 Donhowe Building
Sam Talbert, Manager, Zone 3, Facilities Management, B-117 Moos Tower

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 - VFW Cancer Research Center (Building 109)
EH&S Project No: 109-97-025
Client Project No: for database

Scope of Work: A full building asbestos material survey was conducted on March 10, 1997 through April 8, 1997. 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 VFW Cancer Research Center.

Project Description: Two hundred one (201) bulk samples of suspect ACM were collected on-site and one hundred seventy-nine (179) 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 VFW Cancer Research Center were performed by Delta Environmental Consultants on August 29, 1990, by MacNeil Environmental on February 26, 1992, and by University of Minnesota Facility Management on September 22, 1995. 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" PFI on fiberglass w/tar line (8)
- <4" fibrous PFI on fiberglass line (10)
• 4"-8" white fibrous PI (11)
• 4"-8" PFI on white fibrous line (12)
• 4"-8" felt w/tar line (15)
• 4"-8" fibrous PFI on felt w/tar line (16)
• 4"-8" fibrous PFI on fiberglass w/tar line (18)
• 4"-8" fibrous PFI on fiberglass line (20)
• 9"-14" white fibrous PI (21)
• 9"-14" PFI on white fibrous line (22)
• red duct putty (26)
• white fibrous duct insulation (30)
• white fibrous tank (32)
• spray-on fireproofing (33)
• 9"x9" floor tile, cream w/grey smears (41)
• 9"x9" floor tile, brown w/white streaks (42)
• 9"x9" floor tile, green w/white streaks (43)
• 9"x9" floor tile, dark brown w/white and black specks (44)
• 9"x9" floor tile, grey w/white and black smears (45)
• 9"x9" floor tile, tan w/brown streaks (46)
• 9"x9" floor tile, tan w/black streaks (47)
• 9"x9" floor tile, white w/black smears (48)
• 9"x9" floor tile, white w/green smears (50)
• 9"x9" floor tile, grey w/white and grey streaks (51)
• 12"x12" floor tile, blue black tan and cream mottling (60)
• 12"x12" floor tile, white w/tan streaks (62)
• 12"x12" floor tile, light grey w/olive smears (64)
• 12"x12" floor tile, beige brown and white marble (66)
• 2'x2' ceiling tile, pinhole/fissure (84)
• black lab top (96)
• transite (101)
• debris (104)
• fume hood lining (106)
• ceiling panel (107)
• floor tile under carpet (assumed) (108)
• black sink undercoating (110)
• black lab top undercoating (111)
• white fibrous stove insulation (112)
• grey sink undercoating (113)
• gasket (114)

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

• <4" fiberglass w/tar PI (7)
• <4" fiberglass PI (9)
• 4"-8" fiberglass w/tar PI (17)
• 4"-8" fiberglass PI (19)
• 9"-14" fiberglass PI (23)
• black foam (25)
• 4"-8" black styrofoam PI (27)
• 4"-8" fibrous PFI on black styrofoam line (28)
• grey duct putty (29)
• fiberglass duct insulation (31)
• wall plaster (35)
• red brick mortar (36)
• clay tile mortar (37)
• concrete block mortar (38)
• sheetrock and taping compound (39)
• baseboard adhesive (40)
• floor tile adhesive (44.5)
• 9"x9" floor tile, light grey w/white specks (49)
• 12"x12" floor tile, tan w/white and brown streaks (61)
• 12"x12" floor tile, light grey w/white and black smears (63)
• 12"x12" floor tile, white w/black streaks (65)
• 12"x12" floor tile, tan brown marble (67)
• 12"x12" floor tile, grey w/ white and black swirls (68)
• ceiling tile adhesive (80.5)
• 2'x2' ceiling tile, pinhole/wormhole (86)
• 2'x2' ceiling tile, nailhole (87)
• 2'x4' ceiling tile, pinhole/fissure (90)
• black lab sink (97)
• carpet mastic (102)
• fiberglass backing on metal ceiling tiles (105)
• tan pebble linoleum (115)

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

• floor tile adhesive (41.5, 42.5, 43.5, 45.5, 46.5, 47.5, 48.5, 49.5, 50.5, 51.5, 60.5, 61.5, 62.5, 63.5, 64.5, 65.5, 66.5, 67.5, 68.5, 108.5)
• galbestos (98)
• linoleum adhesive (115.5)

The following friable material tested <1% asbestos:

• ceiling plaster (34)
• 12"x12" ceiling tile, fissure (80)
• tan spray-on fireproofing (103)

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.

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 V78A was not accessible at the time of the survey. In addition, the area above the ceilings in Rooms V69, V177A, V254, V255B, V256, and V279 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.
Debris from asbestos-containing pipe insulation and/or ceiling tiles was discovered above the ceilings throughout the building. Following a clean-up of the visible debris, it is recommended that the areas be sprayed with an encapsulant. Access above the ceilings should be controlled until remediation is completed. Contact Facilities Management’s Asbestos Coordinator Tim Nelson if these remediation techniques wish to be examined further.

Analytical results indicate that the following materials had mixed results (both positive and negative results for asbestos): <4” fibrous PFI on fiberglass (sample 10), 4”-8” fibrous PFI on fiberglass (sample 20), floor tile adhesive (sample 49.5), floor tile adhesive (sample 50.5), floor tile adhesive (sample 61.5), floor tile adhesive (sample 65.5), 12”x12” floor tile (sample 66), floor tile adhesive (sample 66.5), floor tile adhesive (sample 68.5), black lab top (sample 96), and debris (sample 104). These materials need to be considered asbestos-containing; however, project specific sampling can be performed prior to any work performed on these materials.

Based upon analysis, ceiling plaster (sample 34), a 12”x12” ceiling tile (sample 80) and a spray-on fireproofing (sample 103) 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.

At the time of this survey, the door to Room V469 was polyed-off and posted with caution tape. According to an employee in VFW, the room has been polyed-off for several months due to a roof leak which impacted the asbestos-containing ceiling tiles in the room. John Sundsmo of the Facilities Management Asbestos Abatement Unit indicated that on December 13, 1996, his crew removed the ceiling tiles that were impacted by the leaking roof. The remaining ceiling tile and the ceiling grid were then vacuumed with a HEPA vac. The walls and floor of the room and the equipment within the room were wet wiped. Two air monitoring pumps were running during the clean-up. Both samples were analyzed by the University of Minnesota Department of Environmental Health and Safety’s asbestos laboratory. Results of the analysis indicated airborne fiber levels of less than 0.01 fibers per cubic centimeters (f/cc) of air. According to the MDH Asbestos Rules, an occupied building space must not exceed 0.01 f/cc of air as analyzed by phase contrast microscopy. The room is being purposely sealed off until the roof is repaired.

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 spaces above ceilings were completely inaccessible or only slightly visible. In addition, the size and layout of mechanical equipment and/or duct work limited visibility. Laboratory equipment limited visibility in some laboratories. 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>
</tr>
</thead>
<tbody>
<tr>
<td>• thermal system insulation</td>
<td>$114,743</td>
<td>$147,276</td>
</tr>
<tr>
<td>• floor coverings and adhesives</td>
<td>$34,574</td>
<td>$69,148</td>
</tr>
<tr>
<td>• ceiling tile</td>
<td>$21,759</td>
<td>$43,518</td>
</tr>
<tr>
<td>• spray-on fireproofing</td>
<td>$15,840</td>
<td>$25,920</td>
</tr>
<tr>
<td>• debris</td>
<td>$134,273</td>
<td>$145,160</td>
</tr>
<tr>
<td>• miscellaneous materials</td>
<td>$28,444</td>
<td>$45,703</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$349,633</strong></td>
<td><strong>$476,725</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.

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.