August 14, 1996

REPORT: Full Building Survey

TO: Steve Spehn, Zone Manager, Facilities Management Zone 4, 2904 Fairmont Street S.E., Minneapolis, MN 55455

FROM: Greg Archer, Asbestos Group, Environmental Health and Safety, W140 Boynton Health Services, 410 Church St. S.E., Minneapolis, MN 55455

SUBJECT: Asbestos Material Survey - Armory Building
EH&S Project No: 011-96-079
Client Project No: for Data Base

Scope of Work: A full building asbestos material survey was conducted on July 12 through July 30, 1996. 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 nonfriable suspect ACM, to identify nonfriable ACM that may become friable under demolition or renovation conditions, and to provide approximate cost estimates for the removal of identified ACM prior to renovation of the Armory Building.

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 and associated pipe fitting insulation
- <4" felt pipe insulation and associated pipe fitting insulation
- <4" fibrous pipe fitting insulation on fiberglass
- 4"-8" white fibrous pipe insulation and associated pipe fitting insulation
- 9"x9" floor tile, beige with brown and cream
- 9"x9" floor tile, light grey with cream
- 9"x9" floor tile, dark grey with cream
- 9"x9" floor tile, light beige with brown and cream
- 9"x9" floor tile, off white with charcoal
- 9"x9" floor tile, grey with charcoal and white
- 9"x9" floor tile, light grey with black and white
- 9"x9" floor tile, off white with aqua
- 9"x9" floor tile, light grey with cream
- 12"x12" floor tile, white "brick"
- 12"x12" floor tile, tan with beige and white
- 12"x12" floor tile, light grey with black and white
- 2'x2' ceiling tile, fissured pinhole
- 2'x2' ceiling tile, flower pattern
- blue pebbled linoleum
The following suspect materials tested none detected (ND) as ACM:

- transite

- <4" fiberglass pipe insulation
- fiberglass duct insulation
- ceiling plaster
- wall plaster
- clay tile mortar
- red brick mortar
- sheetrock and taping compound
- baseboard adhesive
- 12"x12" floor tile, beige mottling
- 12"x12" floor tile, blue mottling
- 12"x12" floor tile, peach with grey and tan
- 12"x12" ceiling tile, pegboard
- 12"x12" ceiling tile, large/small hole
- 12"x12" ceiling tile, computer board
- 2'x2' ceiling tile, pinhole
- 2'x2' ceiling tile, pinhole worm
- 2'x2' ceiling tile, pinhole crater
- 2'x2' ceiling tile, nail hole worm
- grey linoleum
- canvass vibration joint
- ceiling tile adhesive

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

- floor tile adhesive

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.

2. Facilities Management;
   The quantities listed reflect the visibility and accessibility at the time of the survey. Actual quantities must be verified by contracting entities.

3. General;
   Due to limited access points in the ceilings and walls, some pipe chases and areas 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.

   Debris from asbestos containing pipe insulation was discovered in some areas of the crawl space in the Sub-basement. This area should remain a controlled access area until remediations take place.

   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.
In some rooms, 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.

Ceiling tile adhesive was only found and sampled in Room 202. If any other ceiling tile adhesive is found in other rooms, it should be sampled before being disturbed.

The following rooms were inaccessible at the time of the survey: Rooms 12B-E, Room 17, Room 19, Rooms 20B-D, Room 25, and Room 109.

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>$87,068</td>
<td>$114,510</td>
</tr>
<tr>
<td>ceiling tile</td>
<td>7,740</td>
<td>15,480</td>
</tr>
<tr>
<td>floor tile &amp; adhesive</td>
<td>39,458</td>
<td>78,916</td>
</tr>
<tr>
<td>transite</td>
<td>1,560</td>
<td>2,280</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$135,826</strong></td>
<td><strong>$211,186</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 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 Greg Archer at 626-2199.

Written By: Gregory A. Archer
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cc: Tim Nelson
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