

Appendix C – Solid and Hazardous Waste Reports

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July 27, 2012

City of Knoxville Engineering Department
1400 Lorraine Street
Knoxville, Tennessee 37921

Attention: Mr. Tom Clabo, P.E.

Subject: **Report for Pre-Demolition Hazardous Materials Survey**
Liberty Building
Knoxville, Tennessee
S&ME Project No. 1434-12-212

Dear Mr. Clabo,

S&ME, Inc. (S&ME) is pleased to provide you with this report for the pre-demolition hazardous materials survey services for the Liberty Building in Knoxville, Tennessee. The tasks completed by S&ME for this project were documented within S&ME Proposal Number 313412253 dated July 6, 2012 and authorized on July 10, 2012.

GENERAL PROJECT DESCRIPTION

We understand that the Liberty Building is scheduled for demolition. Based upon the observed age and condition of the building, S&ME was requested to perform a pre-demolition hazardous materials survey assessment which included observation and sampling of the following specific items:

- Asbestos-containing materials
- Lead-based paint
- Universal Wastes (batteries, pesticides, mercury containing equipment, and bulbs/lamps)
- Regulated Materials - Polychlorinated biphenyls and Freon

SCOPE OF SERVICES

Asbestos-Containing Materials Survey Services

S&ME provided a Tennessee Department of Environment and Conservation (TDEC) and Environmental Protection Agency (EPA) accredited Asbestos Inspector to accomplish the asbestos survey and sample collection at the Liberty building on July 11 and 12, 2012. A total of 41 asbestos bulk samples were collected for analysis.

Sampling was limited to readily accessible materials, and no samples were obtained from behind structural walls or other concealed and inaccessible locations. Thus, potential

asbestos containing materials (ACM) could be present that were not identified during this survey. Additional sampling of areas not accessed during this survey may be warranted should renovation or demolition activities reveal materials not evaluated as part of this survey.

An asbestos bulk sample summary table and estimated quantities of identified ACM are provided in Appendix I. Representative photographs of the materials determined to be ACM and drawings showing location or area of the ACMs are provided in Appendix II. The bulk sample laboratory analytical results are provided in Appendix III.

Methods

The asbestos survey involved identifying and collecting bulk samples from suspect ACM. A sampling strategy was developed to provide representative samples in accordance with the EPA Asbestos Hazards Emergency Response Act (AHERA EPA 40 CFR Part 763) sampling protocols. The samples were documented on a chain of custody and submitted for analysis to Environmental Hazards Services, in Richmond, Virginia¹.

The material samples were analyzed by EPA Method 600/R-93/116, Polarized Light Microscopy (PLM) utilizing dispersion staining techniques. PLM identifies asbestos content in a sample by identifying and indexing optical and mineralogical characteristics that are unique to one of six legally recognized asbestos minerals. Asbestos content is visually estimated and is reported as a percentage of the area of the particular sample analyzed.

Results

According to the EPA NESHAP, an ACM is defined as a material containing more than 1% asbestos as determined by PLM. Asbestos-containing materials are classified as friable ACM or non-friable ACM. Friable ACM is "ACM that, when dry, can be crumbled, pulverized or reduced to powder by hand pressure." Non-friable ACM cannot be crumbled, pulverized or reduced to powder by hand pressure. Asbestos-containing materials may be further considered to be regulated asbestos-containing materials (RACM) under the EPA NESHAP standard or not regulated. This is an EPA designation and does not apply to issues concerning compliance with worker health and safety by OSHA rules. The following materials are defined as RACM under the rule:

1. Friable ACM
2. Category I non-friable ACM that has become friable,
3. Category I non-friable ACM that has been subjected to sanding, grinding, cutting or abrading - including use of mechanical buffers and solvents to remove flooring mastic or,

¹ Accredited by the National Institute of Standards and Technology's National Voluntary Laboratory Accreditation Program (NVLAP).

4. Category II non-friable ACM that has a high probability of becoming or has become pulverized or reduced to powder by the forces expected on the material in the course of demolition or renovation operations.

The ACMs that were identified during this pre-demolition survey include:

Description of ACM	Location / Approximate Quantity
Brown Speckled 12" x 12" Floor Tile with Black Mastic	1 st , 2 nd , and 3 rd Floor Offices / 20,000 ft ²
Dry Wall Joint Compound	1 st Floor West and South Hallway and Offices / 6,000 ft ²
Gray 12" x 12" Floor Tile with Black Mastic Under Carpet	2 nd Floor East Offices / 2,000 ft ²
Roofing Felt with Tar over Wood	Roof at Air Handling Units / 8,000 ft ²
Exterior Window Glazing	Exterior Windows / 23 Windows

A comprehensive sample summary table that includes Sample ID, location, asbestos type, ACM classification, and estimated quantities of identified ACM is provided in Appendix I.

Asbestos Survey Limitations

Although Polarized Light Microscopy (PLM)/Dispersion Staining (Method EPA 600/R-93/116) is the specified method for analysis of bulk material samples for asbestos under the EPA AHERA, there have been reports that this method may not identify asbestos when fiber sizes are extremely small or if they are bound in a resinous material. EPA recommends analyzing such materials (floor tiles, mastics and asphaltic roofing) using Transmission Electron Microscopy (TEM) when PLM analysis does not detect asbestos in quantities greater than 1%. Current EPA regulations do not require this additional analysis and the decision to do so is left to the client.

This report is not intended for use as an asbestos removal specification. *The quantities of ACM provided in this report are estimates for sample collection purposes and should not be used for asbestos abatement bidding purposes. The Asbestos Abatement Contractor is responsible for verifying the quantities of ACM for asbestos abatement purposes.* It is not within the scope of this work to describe all appropriate precautions, safeguards and regulations relating to asbestos. Prior to removal of asbestos, we recommend that an appropriately qualified and credentialed asbestos designer develop a removal plan.

Lead-Containing Paint Survey

Paint-chip samples from differentiated surface colors and surface substrates of exterior and interior paint were collected during the assessment. A National Lead Laboratory

Accreditation Program (NLLAP) accredited laboratory was utilized for the analysis of the paint-chip samples.

All paint chip samples collected for this assessment were determined to contain lead. A Lead-Containing Paint Sample Summary Table is provided in Appendix I. Representative photographs of the sampled locations and drawings illustrating sample locations are included in Appendix II. The paint chip sample laboratory analytical results are provided in Appendix III.

Universal Wastes

The federal universal waste regulations are set forth in Part 273 Title 40 of the Code of Federal Regulations (40 C.F.R. 273). Materials regulated under this rule include batteries, pesticides, mercury containing equipment, and bulbs (lamps).

Batteries

Quantities of batteries were not observed during the survey.

Mercury Containing Equipment

Thermostats were not observed to be present on the first floor. Thermostats were observed on the second and third floors but mercury bulb switches were not observed in the thermostats.

Bulbs (Lamps)

Management and disposal of fluorescent light bulbs are regulated under the Resource Conservation and Recovery Act (RCRA), the Universal Waste Rule (UWR), and Subtitle C Hazardous Waste regulations. A standard fluorescent bulb contains eight to 14 milligrams of mercury. Fluorescent light bulbs that are not marked with a green aluminum end cap are generally considered to be regulated universal waste after their useful life.

Two areas of discarded fluorescent light bulbs were observed on the first floor of the Liberty Building. Each storage area contained an estimated 75 to 100 bulbs. Most of the estimated 800-900 light fixtures in the building also contained multiple fluorescent light bulbs. The bulbs observed in the Liberty Building did not have green end caps and are assumed to be regulated items.

Pesticides

Pesticides were not observed during this survey.

Other Regulated Materials

Polychlorinated Biphenyls (PCBs)

Disposal of PCB's at 50 ppm or greater are regulated according to the Toxic Substances Control Act (TSCA), 15 U.S.C. 2601 and set forth in Part 761 of Title 40 of the Code of Federal Regulations (40 C.F.R Part 761). The Tennessee Solid Waste Program does not

permit the disposal of PCB's of 50 ppm or greater in a Subtitle D Sanitary Landfill. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) requires notification when more than one pound (approximately 12 to 16 ballasts) of PCB's are to be disposed.

Four manufacturers of light ballasts were observed throughout the building. One of the brands, Watt-Miser, specified "NO-PCBs" on the ballast label. The remaining three, General Electric, Universal Therm-O-Matic, and Val-Miser, did not specify "NO PCBs" on the ballast label, and therefore are assumed to contain PCBs. An estimated 800-900 fluorescent light fixtures were observed in the Liberty Building. Approximately 75% of the observed ballasts in these fixtures are assumed to be PCB-containing.

Oil from the passenger elevator equipment and the lift elevator equipment was tested for the presence of PCBs. Samples were collected and submitted to ESC Lab Sciences in Mount Juliet, Tennessee. Samples were analyzed using EPA Method 8082 utilizing gas chromatography for PCB analysis. PCBs not detected in the samples analyzed. Laboratory analytical results are included in Appendix III.

Freon

Possible sources of Freon were observed during the assessment. One non-working refrigerator and one heat exchanger associated with an air handling unit were observed on the first floor. One drinking fountain was observed on the second floor. Seven air handling units were observed on the roof. The compressors associated with in this equipment commonly contain Freon. Drawings showing locations of this equipment are included in Appendix II.

CONCLUSIONS and RECOMMENDATIONS

Asbestos Containing Materials

S&ME identified asbestos containing materials in the referenced building which should not be disturbed until they are to be removed. The identified ACM was generally observed to be in good condition. The Occupational Safety and Health Administration (OSHA), the EPA, as well as TDEC have strenuous requirements for asbestos handling, permitting, removal, accreditation, worker safety, transport and waste disposal operations. S&ME recommends contracting accredited asbestos professionals to provide abatement and disposal prior to building demolition.

Lead-Containing Paint

The samples collected for this assessment tested positive for lead content. Therefore, the OSHA Lead Standard 29 CFR 1926.62 will apply and the demolition contractor should comply with the requirements of this Standard.

Current TDEC regulations and policy indicate that if lead paint is adhered to demolition debris surfaces and not loose or peeling, the debris can be disposed in a Class I, II, III, or IV disposal facility, and lead paint removal or testing is not required to determine hazardous leaching potential before disposal. However, if lead based paint removal is anticipated as part of any renovation activity, the removal should be conducted by a State licensed lead-based paint abatement contractor according to all local, state and federal laws and guidelines.

Universal Wastes and Other Regulated Materials

It is recommended that the PCB light ballasts be segregated and containerized for proper disposal. Transportation and disposal should be in accordance with applicable EPA Regulations.

It is recommended that disposal of the Freon containing equipment observed during the survey be conducted by a HVAC professional according to established laws and regulations.

It is recommended that the fluorescent bulbs observed on site be collected and disposed in accordance with federal and state regulations. The fluorescent light bulbs should be disposed of independently of the PCB containing ballasts.


LIMITATIONS

This report is an instrument of service of S&ME. The report was prepared for and is intended for the exclusive use of The City of Knoxville Engineering Department. The contents of this report may not be relied upon by any party other than The City of Knoxville Engineering Department without the express written permission of S&ME.

CLOSING

S&ME sincerely appreciates the opportunity to provide you with this report. If you have any questions, please contact us at (865)970-0003.

Sincerely,
S&ME, Inc.


Aaron Reeves *by TSC*
Asbestos Inspector
A-I-43603-16524


Eric M. Solt
Environmental Services Manager



August 9, 2012

City of Knoxville Engineering Department
1400 Lorraine Street
Knoxville, Tennessee 37921

Attention: Mr. Tom Clabo, P.E.

Reference: **Summary of Environmental Soil Screening Services**
Proposed Parking Garage
Knoxville, Tennessee
S&ME Project No. 1434-12-212

Dear Mr. Clabo:

This letter summarizes the soil screening of the drill cuttings generated from the geotechnical drilling activities that took place at the Liberty Building in Knoxville, Tennessee. The drilling was conducted by S&ME, Inc. (S&ME) from July 23 through July 27, 2012. The soil screening services were conducted by S&ME personnel as outlined in S&ME Proposal No. 313412253 and authorized by you on July 10, 2012.

SUMMARY of SERVICES

An S&ME environmental professional was onsite to observe the drilling operations and specifically to field screen the collected soil cuttings for organic vapor content. Soil drill cutting samples were collected from each borehole at five-foot intervals from the ground surface to bedrock refusal. Portions of each sample were placed into sealed plastic bags for field headspace analysis. The samples were field screened utilizing a properly calibrated photo-ionization detector (PID) and the results were recorded.

A total of eight (8) borings were drilled at the locations identified on the attached Soil Boring Location Map (Figure 1). All 8 borings were field screened for organic vapors, as well as visually inspected for staining and olfactory indications of potential contamination. There was no visual or olfactory evidence of contamination observed. Likewise, field screening of the samples did not indicate elevated organic vapors. Since there were no indications of visual or olfactory contamination exhibited from the 8 boring locations, samples were not submitted for laboratory analysis.

QUALIFICATIONS of REPORT

This report is an instrument of service of S&ME. The report was prepared for and is intended for the exclusive use of the City of Knoxville (City). The report's contents may not be relied upon by any party other than the City without the express written permission of S&ME. The report's findings are based on conditions encountered at the locations on

Report of Soil Screening Results
Liberty Building / Knoxville, Tennessee

S&ME Project No. 1434-12-212
August 9, 2012

the dates of S&ME's investigations and should not be relied upon to precisely represent conditions at any other location or time.

S&ME appreciates the opportunity to provide soil sampling services. Should you have any questions after reviewing this letter, please do not hesitate to contact us.

Sincerely,
S&ME, INC.



James R. Bruce, PG, CHMM
Project Manager

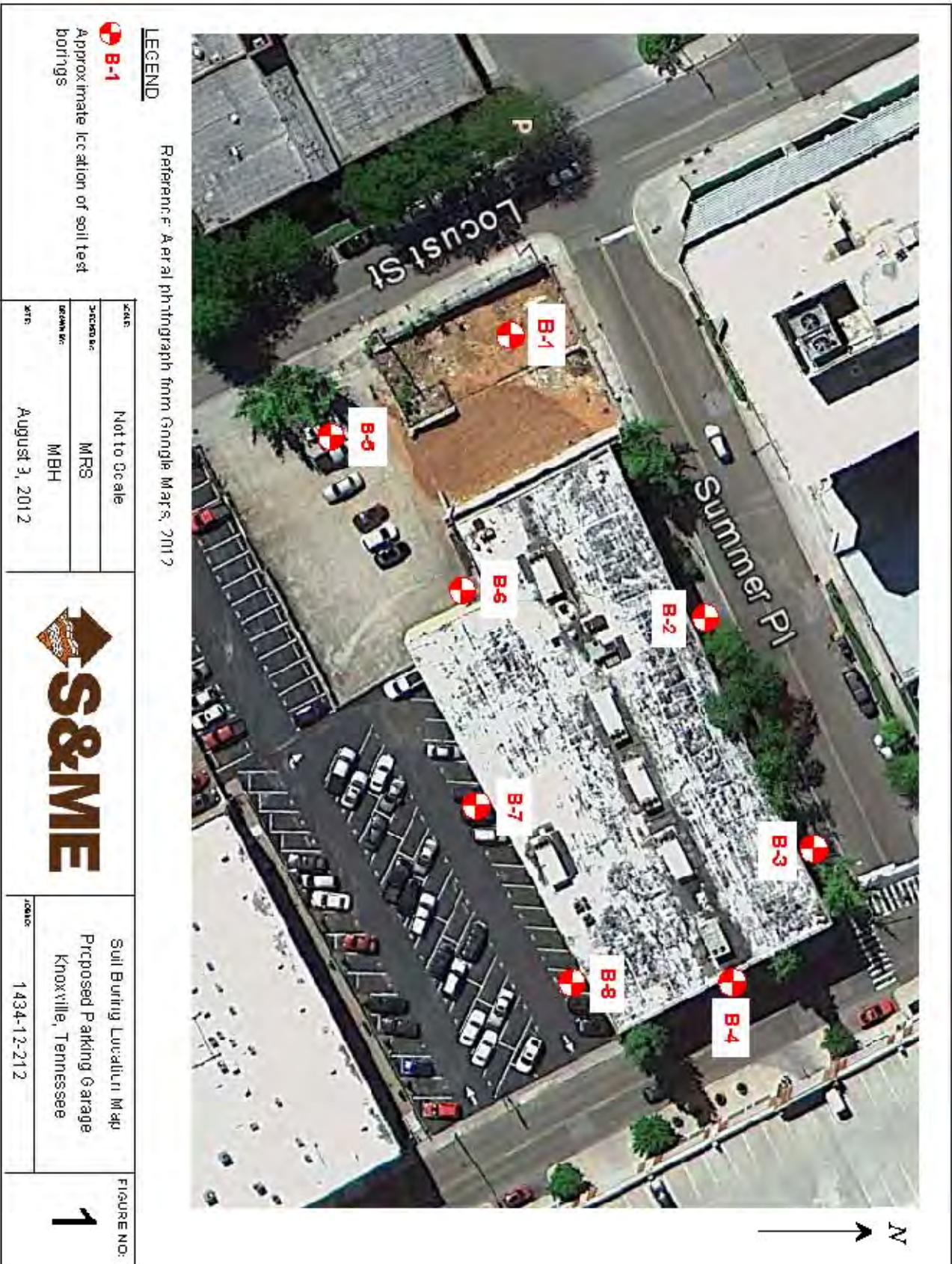


Eric M. Solt, PG
Environmental Services Manager

Reviewed by Michael R. Stomer, PG

Attachments: Soil Boring Location Map

cc: Michael Stomer, S&ME, Inc.



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