H. Hazardous Materials Survey

Prepared by ATC Associates, Inc.

LIMITED HAZARDOUS BUILDING MATERIALS SURVEY
OF

BUILDING 125 - CHARLESTOWN NAVY YARD
NATIONAL PARK SERVICE

ATC PROJECT NO. 60.20028.0001

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Prepared by:

ATC Associates Inc.
600 West Cummings Park, Suite 6500
Woburn, MA 01801
Phone: (781) 932-9400
Fax: (781) 932-6211

Prepared for:

Einhorn Yaffee Prescott
24 School Street
Boston, MA 02108

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1. EXECUTIVE SUMMARY

ATC Associates Inc (ATC) of Woburn, Massachusetts was retained by Einhorn Yaffee Prescott of Boston, Massachusetts to perform a limited asbestos-containing material (ACM), lead paint and PCB containing light fixture ballast survey of Building 125 at the Charlestown Navy Yard located in Boston, Massachusetts. Interior finishes for Building 125 included vinyl floor tiles, sheet flooring, painted and unpainted masonry walls, ceiling tiles and wood. The exterior façade consisted of unpainted brick with painted wood windows and doors.

1.1 Asbestos Survey

The asbestos survey involved locating, quantifying, and assessing the condition of accessible asbestos-containing materials, using bulk sampling and visual inspection techniques. The survey of the facility was performed by Commonwealth of Massachusetts Department of Labor and Workforce Development (MDLWD) - certified asbestos inspector Kevin Drinan (AI# 32387) on May 30, 2002. The survey consisted of investigation and sampling of suspect materials in the designated building areas. A total of 49 samples of suspect asbestos-containing materials were collected, of which 41 samples were analyzed for asbestos content.

ATC's inspector performed both a visual inspection and a representative bulk sampling in the subject areas. Section 3.1 outlines the U.S. Environmental Protection Agency (EPA) guidance document titled, "Guidance for Controlling Asbestos-Containing Materials in Buildings" (Document No. 560/5-85/024) and the sampling techniques required for a comprehensive ACM survey. The findings of this report are based upon representative observations of accessible areas and the number of representative bulk samples that were collected and analyzed. Please reference the bulk sample analytical results from Scientific Laboratories, Inc., New York, NY included in Appendix A.

Table I, found in Section 3.3, contains the detailed findings of the inspection, including location, type of asbestos-containing materials (ACM), current condition and the estimated quantity of each ACM identified or assumed. Asbestos was identified in multiple types of building materials and components, including the following:

- 9" x 9" Red Floor Tile & Associated Mastic
- 9" x 9" Green Floor Tile & Associated Mastic
- 9" x 9" White Floor Tile & Associated Mastic
- Mastic Associated with 9" x 9" Aqua floor Tiles
- Exterior Window and Door Frame Caulking
- Fire Doors, Elevator Doors (Assumed)

Recommendations based on the inspection and bulk-sampling results are discussed in Section 3.5.

ATC has also prepared cost estimates, found in Section 3.7, for the removal of identified or assumed asbestos-containing materials. The estimated total cost for the removal of identified and assumed asbestos-containing materials is approximately **$15,100.00**. The costs associated with hidden materials that may be present in the project area will be approximately 10% of the total estimated cost range. Additional costs will be incurred for project oversight, including final visual inspection by a Massachusetts Department of Labor and Workforce Development (MDLWD) licensed Project Monitor.

1.2 Lead Survey

In Section 4.0, the findings of the Lead Paint Determination are discussed. On May 30, 2002, ATC performed representative lead paint testing of all accessible areas of the subject building. Mr. Harold Springer performed the testing with NITON X–ray Fluorescence (XRF) Lead Paint Analyzer.

Lead paint was detected on the representative painted wood, masonry and metal surfaces tested throughout the building. Table III, found in Section 4.2, contains the results of the testing, including location, building component, substrate, color, and the XRF reading for each component tested within the buildings. Some of the paint was observed in poor condition (i.e., loose and flaking), primarily on the second floor (e.g., masonry wall

and roof structural members) and first floor south wing (e.g., masonry walls). Heavy lead-containing debris was observed on the second floor loft storage area and loft access to the elevator machine room. Renovation activities will require removal of the lead paint debris and substrate surface preparation (i.e., scraping of loose flaking paint) prior to substrate repainting or mounting of other finish materials.

Consequently, all work performed in the building that will disturb these surfaces must comply with OSHA standard 29 CFR 1926.62 for worker protection. Additional requirements include disposal of waste material in compliance with EPA and MA DEP requirements. ATC recommends that waste classification of the components that may be scheduled for removal or demolition, be performed during the design and development phase to properly estimate disposal costs. A more detailed discussion of the waste classification, regulatory implications, and general recommendations based on the lead paint inspection results are discussed in Sections 4.3, 4.4 and 4.5.

ATC estimates the cost for intacting (i.e., removal of loose peeling paint) surfaces coated with lead containing paint and implementing a lead-compliance program for general demolition activities to be approximately **$27,500.00**. This cost includes disposal of removed paints chips as hazardous waste and contractor record-keeping requirements, personal protection of workers, and possible isolation of the work area to comply with the OSHA Lead Standard 29 CFR 1926.62 and DLWD 454 CMR 22.11. Additional costs may include disposal of some of the general demolition debris as hazardous waste depending on the results of TCLP testing.

1.3 PCB Survey

ATC employee, Mr. Kevin Drinan conducted a limited investigation for the presence of PCB-Containing light ballasts within the interior of Building 125. ATC identified approximately sixty (60) PCB-containing light ballasts within the subject area. The estimated cost for the disposal of PCB-containing ballasts within the first floor of Building 125 is **$800.00.** The inspection and results are discussed in Section 5.0.

1.4 Other Hazardous Materials

Although not within ATC's scope of work, ATC observed other potential hazardous materials that may be impacted by planned renovations. The following list of other potential hazardous materials observed by ATC is presented for informational purposes.

1 Elevator machine lubrication oil and elevator control hydraulic fluid – Estimate five to ten gallons
2 Smoke detectors – may contain radioactive source, manufacture's required to take back sensors at no cost.
3 Debris in paint mixing vats and ventilation system – may contain heavy metals from paint pigments.

1.5 Limitations

Our professional services have been performed, our findings obtained and our recommendations prepared in accordance with customary principles and practices in the field of environmental science and engineering. This statement is in lieu of other statements either expressed or implied. This report does not warrant against future operations or conditions, nor does it warrant against operations or conditions present of a type or at a location not investigated.

Environmental evaluations are limited in the sense that conclusions and recommendations are developed from personal interviews and information obtained from limited research and secondary sources. Except as set forth in this report, ATC has made no independent investigations as to the accuracy or completeness of the information derived from the secondary sources and personal interviews and has assumed that such information was accurate and complete.

This report is intended for the sole use of Einhorn Yaffee Prescott. and the National Park Service. The scope of services performed in execution of this evaluation may not be appropriate to satisfy the needs of other users, and use or re-use of this document or the findings, conclusions, or recommendations, is at risk of said user.

2.0 CERTIFICATION OF RESULTS

This report has been prepared for the exclusive use of Einhorn Yaffee Prescott. and the National Park Service. Photocopying of this document by parties other than those designated by Einhorn Yaffee Prescott. or the National Park Service, or use of this document for purposes other than it's intended use, is prohibited.

Respectfully submitted this 7th day of June, 2002

ATC Associates Inc.

Kevin F. Drinan
Project Manager

Doug Rader
Division Manager,. Building Sciences

3.0 ASBESTOS-CONTAINING BUILDING MATERIALS SURVEY

3.1 Sampling Methodology

The survey was performed by an EPA-accredited and Massachusetts licensed asbestos inspector. ATC conducted a limited representative inspection of Building 125 at the Charlestown Navy Yard. Limited exploratory demolition was not performed as part of the survey. Efforts were made to identify multiple layers of flooring systems, as well as any suspect materials located within wall chases, plenum chases, and plumbing chases.

ATC collected representative bulk samples of all identified suspect asbestos-containing materials. In an attempt to reduce the number of samples collected and analyzed, ATC did not analyze samples after a sample from a specific homogenous material indicated that a sample contains greater than 1% or greater asbestos (1st Positive) for all materials. Except where noted herein, sampling was conducted according to the U.S. Environmental Protection Agency (EPA) guidance document titled, "Guidance for Controlling Asbestos-Containing Materials in Buildings" (Document No. 560/5-85/024).

Suspect asbestos-containing building materials exist in the form of surfacing, miscellaneous materials and thermal insulation.

The following illustrates the sampling strategy employed by ATC:

(a) Surfacing materials - In a randomly distributed manner, collect bulk samples of surfacing materials, representative of each homogeneous area, and not assumed to be ACM.

(1) Collect at least three bulk samples from each homogeneous area that is less than or equal to 1,000 ft^2.

(2) Collect at least five bulk samples from each homogeneous area that is greater than 1,000 ft^2, but less than or equal to 5,000 ft^2.

(3) Collect at least seven bulk samples from each homogeneous area that is greater than 5,000 ft^2.

(b) Thermal systems insulation.

(1) In a randomly distributed manner, collect at a minimum, three (3) bulk samples of thermal systems insulation material, representative of each homogeneous area, and not assumed to be ACM.

(2) Collect, at a minimum, one (1) bulk sample of patched thermal systems insulation, representative of each homogenous area, and not assumed to be ACM, providing the section of patch was less than 6 linear or square feet.

(3) Collect, at a minimum, three (3) representative bulk samples of each insulated mechanical system not assumed to be ACM, including, but not limited to cementitious material used on pipe fittings such as tees, elbows, or valves. Representative sampling was conducted in a manner sufficient as to identify whether each homogenous area is either asbestos or non-asbestos containing.

(4) Bulk samples are not required to be collected from any homogeneous area where the accredited asbestos inspector has determined that the thermal systems insulation is a non-suspect material (i.e., fiberglass, foam glass, rubber, or any other non-ACM).

(c) Miscellaneous materials - Collect, at a minimum, one (1) representative bulk samples of each miscellaneous material not assumed to be ACM, including, but not limited to ceiling tiles, floor tiles, associated floor tile mastic, etc. Representative sampling was conducted in a manner sufficient as to identify whether each homogenous area is either asbestos or non-asbestos containing.

For the purpose of this report, ATC has classified the asbestos-containing materials as being either in Good, Fair or Poor condition. The following are the general definitions of each category:

- Good Condition – Any material which is intact with no noticeable damage
- Fair Condition – Any material with a small amount of overall or localized damage (generally less than 10% of the entire area).
- Poor Condition – Any material with a large amount of damage (generally greater than 10% of the entire surface area).

3.2 Review of Existing Documents

No documents or previous reports relative to asbestos-containing materials were provided.

3.3 Asbestos-Containing Building Materials

The following is a listing of all *suspect* asbestos-containing materials identified and bulk sampled by ATC.

- 9″ x 9″ Red Floor Tile and Associated Mastic
- 9″ x 9″ Aqua Floor Tile and Associated Mastic
- 9″ x 9″ Green Floor Tile and Associated Mastic
- 9″ x 9″ White Floor Tile and Associated Mastic
- Resilient Sheet Flooring (two types)
- Plaster
- Floor Leveling Compound
- 2′ x 2′ Ceiling Tiles
- Pipe Fitting Insulation, Fiberglass Insulated Pipes
- Exterior Window and Door Frame Caulking
- Exterior Window Glazing Compound

The following table provides the material location, estimated quantity, and general condition of identified asbestos-containing and assumed asbestos-contaminated materials at the subject building.

TABLE I - ASBESTOS-CONTAINING BUILDING MATERIALS

Building 125 - Charlestown Navy Yard, Boston, Massachusetts

Location	Material	Estimated Quantity	Condition
First Floor	Fire Door at Stairwell (Assumed ACM – Enclosed in Sheet Metal)	35 SF	Good
	Sliding Fire Doors (3 units) (Assumed ACM – Enclosed in Sheet Metal)	180 SF	Good
	Elevator Doors (Assumed ACM – Enclosed in Sheet Metal)	40 SF	Good
Second Floor - Offices	9″ x 9″ Red Floor Tile & Associated Mastic	500 SF	Fair

Location	Material	Estimated Quantity	Condition
	9″ x 9″ White and 9″ x 9″ Green Floor Tile & Associated Mastic (Some under carpet)	325 SF	Good
	Mastic Associated with 9″ x 9″ Aqua Floor Tiles (Floor Tiles Assumed Contaminated With Mastic)	400 SF	Good
Second Floor, Hall	Elevator Doors (Assumed ACM – Enclosed in Sheet Metal)	40 SF	Good
Second Floor – Restroom	9″ x 9″ Green Floor Tile & Associated Mastic	110 SF	Good
Second Floor Elevator Machine Room	Switch Mounting Panel (Assumed ACM)	12 SF	Good
	Fire Door (Assumed ACM – Enclosed in Sheet Metal)	15 SF	Good
Exterior	Exterior Window and Door Frame Caulking	1,700 LF	Good

Due to the non-destructive nature of the asbestos survey ATC did not fully inspect concealed spaces (e.g. behind wall façades; interior wall chases; areas above fixed ceilings; inaccessible mechanical areas; etc) and equipment (e.g. inside boilers, generators etc.).

Bulk samples of suspect materials were analyzed by Scientific Laboratories, Inc. using the approved polarized light microscopy with dispersion staining (PLM/DS) method. By using the PLM/DS method, a trained microscopist is able to identify and distinguish between asbestos group minerals and other fibrous materials such as cellulose (paper), mineral (rock), wood, or glass fiber. The quantity of each of these substances is estimated on a weight basis and recorded as a percent. Only the asbestos content, if any, is recorded in the bulk sample Report of Analysis (Appendix A). If a material contains greater than 1% asbestos, it is considered to be asbestos-containing material.

Scientific Laboratories, Inc. is an accredited laboratory by the EPA for "Interim Asbestos Bulk Sample Analysis Quality Assurance Program". Scientific Laboratories, Inc. also accredited by the National Voluntary Laboratory Accreditation Program (NVLAP). The PLM/DS analytical method is modeled after 40 CFR Part 763, Subpart F, Appendix A: "Interim Method for the Determination of Asbestos in Bulk Insulation Samples".

3.4 Consideration for Hidden Materials

ATC evaluated areas that were reasonably accessible at the time of the survey, in all building areas associated with the planned renovation work. ATC's survey scope of work did not include performing exploratory demolition to access potential hidden asbestos. Based on ATC's experience, concealed asbestos-containing materials in this building could include but not be limited to ceramic floor tile mastic or mortar. Fire rated doors observed have been assumed to contain concealed asbestos and are included in the inventory and cost estimates presented. All suspect insulation, mastics, mortar, or other suspect materials uncovered during future demolition activities, and not identified as being sampled in this report, should be assumed to be asbestos-containing unless future bulk sampling reveals otherwise. Additionally, equipment associated with heat generation (e.g. boilers, exhaust stacks) may have internal components that contain asbestos.

3.5 Recommendations

Developing and implementing an effective strategy to deal with ACM requires an evaluation of such factors as the amount, specific type, location, current condition and the potential for asbestos fiber release from each type of ACM. The potential for asbestos fiber release depends on the following factors:

- Each material's friability (i.e., ability to be reduced by hand pressure)

- The amount of exposed surface area or condition type
- The amount of disturbance that each ACM will be subjected to

Once all these factors have been assessed, one of the following methods of ACM control can be recommended:

1. *Removal:* The physical process of permanently removing ACM from surfaces or substrates within the building.

2. *Encapsulation:* The application of a coating or liquid sealant to ACM to reduce the tendency of the material to release fibers.

3. *Enclosure:* The covering or wrapping of friable ACM in, under or behind airtight barriers.

4. *O & M Program:* A plan consisting of policies and procedures describing specific actions applicable to the prevention of asbestos fiber release by minimizing disturbance or damage to ACM and establishing long term surveillance of the facility with regard to renovation, maintenance, cleaning and general observations.

The information and recommendations present in this report are intended to provide guidelines for dealing with the surveyed areas containing ACM. These recommendations reflect requirements, guidelines and practices established by regulatory agencies on the federal, state and local levels.

Specific Recommendations

In its current state, all non-friable asbestos-containing materials (i.e., floor tile and associated mastic, window caulking) do not pose an immediate health risk in their current condition. Cutting, abrading, drilling or breaking these asbestos-containing materials is prohibited. No friable asbestos-containing materials (i.e., pipe and pipe fitting insulation) were observed. Due to the potential health hazard, ATC recommends the removal and proper disposal of identified ACM that may be damaged or impacted by renovation or demolition activities by a Massachusetts DLWD-licensed asbestos abatement contractor.

General Recommendations

ATC does not recommend the removal of any ACM identified to be in good conditions in areas surveyed, based on the current condition of these materials at the time of the survey. Removal of asbestos-containing materials in good condition are required only prior to disturbance. ATC recommends that all areas and materials noted in poor condition should be properly decontaminated or abated in a timely manner.

An asbestos abatement contractor is required to follow the requirements outlined in Massachusetts State and Federal regulations regarding asbestos, however ATC recommends the development of a project specification and the use of project oversight to ensure compliance with all applicable regulations as well as protect the interest of the Owner and its employees. The project specification shall reference those regulations pertinent to this project, including those work procedures that shall be followed by all asbestos personnel specific to this project. The project oversight provides the Owner with onsite technical expertise during all phases of the abatement work. Tasks performed during project oversight should include periodic work inspections to ensure that all procedures employed by the abatement contractor are acceptable, and air monitoring around each work area to detect elevated asbestos fiber levels. The project oversight provides a constant management of the abatement project to ensure that all asbestos-containing materials are removed in accordance with all applicable regulations and to prevent an asbestos fiber release. These additional services can be provided by ATC upon request.

Additionally, it is the recommendation of ATC that if a suspect material has not been positively identified, but is similar in mode of occurrence or physical properties as other identified asbestos-containing materials, it should be considered asbestos containing. Only through further sampling and analysis can a suspect material be identified as non-asbestos.

The information and recommendations present in this report are intended to provide guidelines for dealing with the surveyed areas containing asbestos materials. These recommendations reflect requirements, guidelines and practices established by regulatory agencies on the federal, state and local levels.

3.6 Additional Sampling Recommendations

ATC recommends that other suspect materials that were either not included in the scope of work or hidden materials that may possibly be uncovered by exploratory demolition (e.g. ceramic wall and floor tile mastics, roofing materials, vapor barrier, pipe chases), should be identified and sampled prior to any renovation work that might impact these materials. These suspect materials should be assumed asbestos-containing until future sampling proves otherwise.

It is also the recommendation of ATC that if an accessible suspect material has not been positively identified or inadvertently missed by ATC, but is similar in mode of occurrence or physical properties as other identified asbestos-containing materials, it should be considered asbestos-containing. Only through further sampling and analysis should a suspect material be identified as non-asbestos.

3.7 Cost Estimates

The costs associated with the abatement of asbestos-containing materials are based upon current Department of Labor and Workforce Development and OSHA standards and requirements. ATC estimates the cost for the removal and disposal of all identified asbestos-containing materials to be approximately **$15,100.00**. Additional costs will be incurred if future bulk sampling reveals uncovered hidden materials (e.g. vapor barrier, pipe insulation, roofing components) to contain asbestos. The additional costs associated with the removal of hidden materials found to contain asbestos will be substantially higher than the initial cost estimate and may cause significant time delays or extend the time line of a project. Please refer to the table below for the breakdown of costs.

TABLE II - COST ESTIMATES
Identified Asbestos Containing Materials

Asbestos-Containing Material	Estimated Quantity	Estimated Removal Cost
Floor Tile and Associated Mastic	1,335 SF	$6,000.00
Exterior Window and Door Frame Caulking	1,700 LF	$7,500.00
Asbestos-Cement Panel (Assumed ACM)	12 SF	$100.00
Fire Doors, Elevator Doors (Assumed ACM)	310 SF	$1,500.00
Total Approximated Cost Estimate		**$15,100.00**

Additional costs will be incurred for additional sampling, project design, project management and air monitoring, including final visual Inspection by a Massachusetts Department of Labor and Workforce Development (MDLWD) licensed Project Monitor.

4.0 LEAD PAINT DETERMINATION

4.1 Sampling Methodology

ATC performed a lead paint determination on representative surfaces that may be impacted by planned renovations. The primary method of determining the lead content on the painted surfaces throughout the building was by X-ray Fluorescence (XRF) Analysis. ATC utilized a Niton Lead Paint Analyzer for this survey. Mr. Michael McCarter, who is trained by Niton in safety measures and use of the instrument, performed the survey.

At this time, there are no federal or state regulations that specifically identify testing procedures via XRF in non-residential buildings. ATC followed the manufacturer's testing methodology for procedures.

The Occupational Safety and Health Administration (OSHA) requires employers to determine an employee's exposure to airborne concentration of lead while impacting surfaces coated with lead-containing paints and requires that the contractors and their employees adhere to the OSHA Lead-in-Construction standard found at 29 CFR 1926.62. OSHA defines a lead containing surface coating as any paint or coating that contains detectable lead. Although XRF measuring techniques are a quick and useful tool for quantifying the lead content of paint, OSHA does not recognize XRF negative results as a means of demonstrating that a paint or coating does not contain lead. OSHA requires that follow-up laboratory analytical techniques be utilized to demonstrate that a paint does not contain lead.

4.2 Summary of Findings

The following table is a listing of representative surfaces tested throughout the building.

TABLE III - COMPONENTS TESTED VIA XRF

Location	Component	Substrate	Color	XRF Result (mg/cm^2)
First Floor				
Main Room	Wall	Brick	Cream	>9.9
	Entry Sliding Door	Wood	Cream	>9.9
	Floor	Concrete	Red	0.3
	(3) Front Window Sashes	Wood	Cream	7.3
	Front Window Casings	Wood	Cream	7.4
	Front Window Sills	Wood	Cream	8.8
	Sliding Door - Left	Metal	Cream	0.5
	Elevator Door	Metal	Cream	6.9
	Elevator Door Casing	Metal	Cream	2.9
	Fire Door To Second Floor	Metal	Cream	>9.9
	Fire Door Casing	Metal	Cream	1.9
	(6) Rear Window Sashes	Wood	Cream	8.3

Location	Component	Substrate	Color	XRF Result (mg/cm^2)
	Front Window Casing	Wood	Cream	7.2
	Front Window Sills	Wood	Cream	7.5
	Rear Safety Grates	Metal	Cream	0.5
	Pipes	Metal	Cream	0.3
	Exit Stair Treads	Metal	Cream	>9.9
	Exit Stair Stringers	Metal	Cream	9.0
	Exit Stair Handrail	Metal	Cream	5.9
	Exit Door	Metal	Cream	1.4
	Exit Door Casing	Metal	Cream	0.4
	Exit Door Threshold	Metal	Cream	7.7
	Brick Molding	Wood	Cream	5.5
	Door To North Wing	Metal	Cream	>9.9
	Door Frame	Metal	Cream	-0.1
	Walls	Brick	Cream	2.0
Bathroom	Window Sash	Wood	Cream	1.0
	Window Casing	Wood	Cream	9.1
	Window Sill	Wood	Cream	0.1
	(2) Doors	Wood	Natural	0.1
	Door Frame	Wood	Cream	-0.1
Water Heater room	Ceiling	Plaster	Cream	6.8
	Wall	Plaster	Cream	>9.9
	Wall	Brick	Cream	1.8
	Window Sash	Wood	Cream	>9.9
	Window Casing	Wood	Cream	>9.9
	Window Sill	Wood	Cream	9.2
Stairs to Second Floor	Walls	Brick	Light Green	>9.9
	Wall	Plaster	Light Green	0.4
	Handrails	Metal	Black	0.2
	Treads	Concrete	Gray	1.2
	Risers	Concrete	Gray	0.9
	Treads	Metal	Black	0.2
	Bottom Tread	Concrete	Yellow/red	6.9
	Door	Metal	Gray	>9.9

Location	Component	Substrate	Color	XRF Result (mg/cm^2)
	Door Frame	Metal	Gray	0.3
	Structural Beam	Concrete	Light Green	4.9
	Corner Brace	Metal	Light Green	6.6
	(6) Window Sashes	Wood	Gray	6.2
	Window Casings	Wood	Gray	9.4
	Window Sills	Wood	Gray	>9.9
North Wing, Carpenters Shop	Upper Walls	Brick	White	>9.9
	Lower Walls	Brick	Green	>9.9
	Floor	Concrete	Gray	2.5
	(8) Window Sashes	Wood	Gray	>9.9
	Window Casings	Wood	Gray	7.8
	Window Sills	Wood	Gray	8.5
	Exit Double Door	Wood	Gray	1.1
	Exit Door Frame	Wood	Gray	4.3
	Ladder By Exit Door	Metal	Gray	1.7
	Walls	Concrete Block	White	4.0
	Locker Area Door	Metal	Gray	3.3
	Door Frame	Metal	Gray	6.6
	Ladder to Storage	Metal	Green	0.6
	Rafter Beam	Wood	White	>9.9
	Roof Boards	Wood	White	>9.9
North Wing, Art Room	Walls	Brick	White	>9.9
	Rafter Beams	Metal	White	>9.9
	Roof	Concrete	White	9.9
	Garage Door	Metal	Green	0.8
	Door Frame	Metal	Brown	-0.1
	Door Frame	Wood	Gray	7.7
	(3) Window Sashes	Wood	Gray	>9.9
	Window Casings	Wood	Gray	>9.9
	Window Sills	Wood	Gray	>9.9
North Wing, Furnace Room	Walls	Concrete	White	>9.9
	Walls	Brick	White	>9.9
	Floor	Concrete	RED	2.1

Location	Component	Substrate	Color	XRF Result (mg/cm^2)
	Door	Metal	Gray	-0.2
	Door Frame	Metal	White	0.0
	(6) Window Sashes	Wood	White	6.9
	Window Casings	Wood	White	8.4
	Window Sills	Wood	White	7.5
	Door To Main Room	Metal	Gray	>9.9
	Door Frame	Metal	Cream	0.1
South Wing, South Room	Walls	Sheetrock	White	0.4
	Walls	Brick	White	6.2
	Double Door	Wood	Gray	-0.1
	Door Frame	Wood	Gray	-0.1
	Floor	Brick	Gray	1.0
	Floor	Concrete	Gray	0.8
	(1) Window Sash	Wood	Black	6.2
	Window Casings	Wood	Black	9.5
	Window Sill	Wood	Black	>9.9
South Wing, Paint Room	Walls	Brick	Gray	5.8
	Walls	Brick	Green	>9.9
	Floor	Concrete	Red	8.9
	(6) Window Sash	Wood	Gray	>9.9
	Window Casings	Wood	Gray	>9.9
	Window Sill	Wood	Gray	8.0
	PIPING	Metal	Gray	0.6
	(2) Paint Vats	Metal	Gray	1.3
	Paddle Motor	Metal	Cream	1.3
	Tub	Metal	Gray	0.7
	Vat Bases	Metal	Gray	1.2
South Side MIT Space	Walls	Brick	Cream	2.1
	Walls	Concrete	Cream	-0.2
	Ceiling	Concrete	Cream	0.2
	Stair Treads	Wood	Gray	0.2
	Stringers	Wood	Gray	0.1
	Rafters	Wood	Cream	0.2

Location	Component	Substrate	Color	XRF Result (mg/cm^2)
Second Floor				
Hall	Walls	Brick	Cream	0.9
	Walls	Wood	Cream	-0.3
	Baseboards	Wood	White	-0.0
	Floor	Concrete	Gray	4.5
	(3) Doors	Wood	White	0.2
	Door Frames	Wood	White	0.1
	Ladder to Elevator Machine Room	Metal	Gray	-0.1
Bathroom	Walls	Brick	Cream	>9.9
	Walls	Metal	Cream	-0.0
	Walls	Metal	Gray	3.0
	Radiator	Metal	Cream	0.8
	Support Column	Metal	Cream	0.4
	(4) Window Sashes	Wood	Cream	5.2
	Window Casings	Wood	Cream	9.0
	Window Sills	Wood	Cream	3.6
	Partitions	Metal	Gray	-0.3
	Ceiling	Metal	White	0.0
	Door	Metal	Cream	0.3
	Door Frame	Metal	Cream	-0.1
Storage Loft Above Offices	Rafters	Metal	Cream	4.3
	Rafter Support Beam	Metal	Cream	1.2
	(2) Round Windows	Wood	Cream	6.8
	Walls (loose, peeling)	Brick	Light Green	4.6
	Ceiling (loose, peeling)	Concrete	Light Gray	2.0
Office #1, Southeast Corner	Walls	Wood	Natural	0.0
	Windows	Wood	Natural	0.0
Office #1 Bathroom	Lower Wall	Wood	Cream	0.1
	Radiator	Metal	Cream	0.7
Office #2, South Side	Walls	Wood	Natural	0.0
	Windows	Wood	Natural	0.0
	Exterior Window	Wood	White	>9.9
	Radiator	Metal	Brown	-0.0

Location	Component	Substrate	Color	XRF Result (mg/cm^2)
Office #3, South Side	Walls	Wood	Cream	-0.1
	Walls	Brick	Cream	>9.9
	Floor	Concrete	Gray	2.2
	Radiator	Metal	Cream	0.8
	(3) Window Sashes	Wood	White	9.2
	Window Casings	Wood	White	>9.9
	Window Sills	Wood	White	.9.9
	Door	Wood	White	-0.1
	Door Frame	Wood	Light Green	-0.2
Office #4, Southwest Corner	Walls	Wood	Gray	-0.3
	Walls	Brick	Gray	9.6
	Exit Door	Wood	Gray	0.0
	Exit Door Frame	Wood	Natural	-0.3
	Treads	Wood	Red	-0.1
	Riser	Wood	Gray	0.3
	Stringer	Metal	Gray	1.6
	Floor	Concrete	Gray	2.5
	(5) Window Sashes	Wood	White	8.5
	Window Casings	Wood	Gray	8.8
	Window Sills	Wood	White	>9.9
Center Office off Hall	Walls	Wood	Cream	1.7
	Walls	Brick	Cream	5.4
	Baseboards	Wood	Black	0.2
	(2) Window Sashes	Wood	Cream	5.2
	Window Casings	Wood	Cream	9.3
	Window Sills	Wood	Cream	>9.9
	Door	Wood	Cream	0.3
	Door Frame	Wood	Cream	0.2
	Door on Left	Wood	Cream	1.2
	Door Frame	Wood	Cream	0.2
Office, Northwest Corner	Walls	Wood	Cream	0.1
	Walls	Brick	Cream	2.5
	Baseboards	Wood	Black	0.2

Location	Component	Substrate	Color	XRF Result (mg/cm^2)
	Door	Wood	Cream	0.3
	Door Frame	Wood	Cream	-0.0
	(8) Window Sashes	Wood	Cream	7.9
	Window Casings	Wood	Cream	>9.9
	Window Sills	Wood	Cream	>9.9
Elevator Machine Room	Ladder	Metal	Light Green	2.8
	Door	Metal	Gray	>9.9
	I-Beam	Metal	Black	5.6
	Rafter Beam	Metal	Silver	4.8
	Walls	Brick	Light Green	7.8
Exterior				
A - Side Front (East)	Double Door on Left	Wood	Gray	-0.0
	Door Frame	Wood	Gray	-0.0
	Window Grates	Metal	White	-0.2
	Brick Molding	Wood	White	>9.9
	Main Entrance Door	Wood	Gray	3.5
	Door Frame	Wood	Gray	>9.9
	Brick Molding	Wood	Gray	1.6
	Gargage	Metal	Dark Green	1.0
	Door Frame	Metal	Dark Green	1.1
	Drain Pipe	Metal	Gray	-0.3
B – Side (South)	Door	Wood	Gray	0.2
	Door Frame	Wood	Gray	1.7
	Header Beam	Metal	Gray	9.5
	Window Sashes	Wood	White	8.1
	Window Grates	Metal	Green	0.2
	Brick Molding	Wood	White	>9.9
South Side Exterior Stairs	Columns	Wood	Gray	-0.2
	Stringers	Wood	Gray	-0.2
	Newel Post	Wood	Gray	-0.3
	Treads	Wood	Gray	0.0
	Handrails	Wood	Gray	-0.2
C – Side (West)	Door	Metal	Dark Green	0.8

Location	Component	Substrate	Color	XRF Result (mg/cm^2)
	Treads	Metal	Dark Green	3.3
	Stringers	Metal	Dark Green	4.8
	Handrails	Metal	Dark Green	4.1
	Lintels	Metal	Gray	5.4
	Window Sashes	Wood	White	>9.9
	Window Casings	Wood	White	>9.9
	Window Sills	Wood	White	>9.9
	Window Grates	Metal	Dark Green	4.0
	Brick Molding	Wood	Dark Green	>9.9
	Gas Pipe	Metal	Gray	-0.2
	Conduit Pipe	Metal	Gray	-0.1
	Box	Metal	Gray	5.2
	Safety poles (bollards)	Metal	Yellow	-0.2
D – Side (North)	Door	Wood	Gray	1.3
	Door Frame	Wood	Gray	1.6
	Lintels	Metal	Gray	6.6
	Window Sashes	Wood	White	>9.9
	Window Casings	Wood	White	9.0
	Window Sills	Wood	White	>9.9
	Window Grates	Metal	Dark Green	2.4
	Brick Molding	Wood	Dark Green	>9.9

ATC's inspector was able to access all survey areas to perform both a visual inspection and XRF testing of painted surfaces. The XRF testing listed is representative of painted surfaces in the buildings. Should future renovation activities impact a painted surface of a color, style or type not specifically mentioned in this report, ATC recommends that the surface is assumed to be painted with a lead-containing material until further testing can be performed.

4.3 Regulatory Implications and Regulations

1.4.1.1 Worker Protection

The implications of lead paint existing in a non-residential building are related to the future use of the facility and the need to impact these painted surfaces during the renovation/demolition process. Renovations/demolition will require the contractors to address worker exposure where the surfaces coated with lead paint are going to be disturbed.

OSHA defines any detectable concentration of lead paint as a **potential** lead exposure hazard to workers doing construction/demolition-type work on these surfaces as even small concentrations of lead can result in

unacceptable employee exposures depending upon the method of removal and other workplace conditions. Since these conditions can vary greatly, the lead-in-construction standard was written to require exposure monitoring or the use of historical or objective data to ensure that employee exposures do not exceed the action level of 30 micrograms per cubic meter of air ($\mu g/m^3$). Historical data may be applied to all construction tasks involving lead.

OSHA states that until the employer performs an exposure assessment (or can supply prior data regarding the same type of work which may exempt them from the standard) and documents that employees are not exposed above the permissible exposure limit (PEL) of greater than 50 $\mu g/m^3$ of air, the employer must treat employees as if they were exposed above the PEL for the following operations:

- manual demolition of structures, manual scraping, manual sanding, and use of heat gun where lead-containing coatings or paints are present;
- abrasive blasting enclosure movement and removal;
- power tool cleaning
- lead burning;
- using lead-containing mortar or spray painting with lead-containing paint;
- abrasive blasting, rivet busting, or welding, cutting, or burning on any structure where lead-containing coatings or paint are present;
- cleanup activities where dry expendable abrasive are used; and
- any other task the employer believes may cause exposure in excess of the PEL.

This means providing respiratory protection, protective work clothing and equipment, change areas, hand washing facilities, biological monitoring, and training until an exposure assessment has determined that the work activity will result in a exposure below the PEL. Additional requirements under this standard include a written compliance program as well as record keeping.

Waste Disposal

Waste disposal is governed by the Federal Resource Conservation and Recovery Act (RCRA) regulations, which distinguish between solid wastes and hazardous wastes. Solid wastes include general construction debris and are subject to minimum handling, transportation, and landfill disposal requirements under RCRA regulations. Hazardous wastes, including certain lead-containing materials, are subject to restrictions designed to prevent the hazardous materials from entering the environment. Lead waste is classified as hazardous or non-hazardous based on the results of the Toxic Characteristic Leachate Procedure (TCLP) testing. The leachability test measures whether or not lead leaches from the waste in excess of the regulated level of 5.0 mg/L. If the results of the TCLP analysis exceed this level, the waste must be handled, transported and disposed as a hazardous waste in an approved waste site, reclamation facility or incinerator site.

EPA's regulations require the leachability test, TCLP, to be performed so that it represents the matrix and material of the waste stream. For the project, this can be in the form of a representative sample of demolition debris taken either before or after the project begins.

Metal that may be removed which contains lead is exempt from the requirements of RCRA since it is not considered a waste because it can go to a scrap facility for recycling. ATC recommends that the owner receive a receipt or bill of lading from the scrap facility stating that the scrap metal was accepted and purchased by the scrap facility.

4.4 Recommendations

Prior to renovations ATC recommends the development of a project specification to ensure compliance with all applicable regulations as well as protect the interest of the client. The project specification shall reference the regulations pertinent to this project, including those work procedures that shall be followed to comply with OSHA requirements and waste disposal.

ATC strongly recommends that TCLP analysis and waste classification be performed during the design and development phase to properly estimate disposal costs. Waste classification will allow for the identification of acceptable work procedures to those bidding on the renovation project.

4.5 Cost Estimates

ATC estimates the cost for intacting (i.e., removal of loose peeling paint) surfaces coated with lead containing paint and implementing a lead-compliance program for general demolition activities to be approximately **$27,500.00**. This cost includes disposal of removed paints chips as hazardous waste and contractor record-keeping requirements, personal protection of workers, and possible isolation of the work area to comply with the OSHA Lead Standard 29 CFR 1926.62 and DLWD 454 CMR 22.11. Additional costs may include disposal of some of the general demolition debris as hazardous waste depending on the results of TCLP testing.

TABLE IV - COST ESTIMATES
Lead Containing Paints

Work Item	Estimated Quantity	Estimated Cost
Intact Masonry Walls and Ceilings and Metal structural Components Coated with Lead-Containing Paint	10,000 SF	$12,500.00
Intact Wood Exterior Windows	Lump Sum	$7,500.00
Remove Lead-Contains Paint Debris	1,700 LF	$2,500.00
General OSHA required Lead Compliance Program	Lump Sum	$5,000.00
Total Approximated Cost Estimate		**$27,500.00**

5.0 PCB SURVEY

On May 30, 2002, Mr. Kevin Drinan of ATC conducted a survey of potential polychlorinated biphenyl (PCB) containing fluorescent light ballasts within the first floor of Building 5. Fluorescent light ballasts manufactured prior to 1979 may contain small quantities of PCBs. Recently manufactured fluorescent light ballasts are required to have "No PCB" labels. The primary concern regarding the disposal of used fluorescent ballasts is the health risk associated with exposure to PCBs. Upgrading a lighting system will likely involve the removal and disposal of lamps and/or ballasts. The proper method for disposing spent ballasts depends on the type and condition of the ballasts and the state in which the ballasts are removed and discarded.

ATC visually inventoried fluorescent light fixtures within the subject building. The survey was limited in that not each individual light fixture was inspected and estimates were made based on inspections of representative fixtures to determine an approximate total number of ballasts. After identifying fluorescent light fixtures within the subject building, ATC accessed a representative number of ballasts (approximately 10%) to check for "No-PCB" labels. If ballasts are not labeled "No-PCB", they should be assumed to contain PCBs.

Several varieties of fluorescent light fixtures were noted throughout the subject area. The second floor contained two styles of 2-bulb fixtures four feet long, each with one ballast. Some of these ballasts were observed to be labeled "No PCB's" but other ballasts were observed with no labels. For purposes of this report, ATC assumes that all ballasts on the second floor contain PCB's. The first floor south wing contained "intrinsically safe" fluorescent light fixture in the former paint mixing room. These fixtures were not accessible for ballast inspection. For purposes of this report, ATC assumes that each of these fixtures contains two PCB-containing ballasts. Fluorescent light fixture in the restrooms and north wing were generally observed to contain ballasts labeled "No PCB's". Older 2-bulb four-foot fixtures located in the carpenter shop are assumed to contain one ballast each ATC estimates the total number of ballasts to be sixty (60).

The estimated cost for the disposal of PCB-containing ballasts from Building 125 is **$800.00**. This cost includes only the removal and disposal of PCB ballasts and does not include ballast replacement, administrative and report preparation costs associated with the activities. ATC inspected only a representative number of fixtures and ballasts and cannot attest to the PCB content of those fixtures not inspected. An accurate inventory of fluorescent light fixtures and ballasts can only be achieved by a comprehensive survey in which all fixtures are inspected.