

Asbestos Survey Report

V.A. Medical Center - Building 8



February 28, 2005

Prepared For:


William Jennings Bryan Dorn
Veterans Affairs Medical Center
Columbia, SC

ARM Project No. 09-102-04

Report Compiled By


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ARM ENVIRONMENTAL
SERVICES, INC.

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[illegible]

Landmark Square Shopping Center

**Cedar Terrace
Shopping center**

To
Columbia

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Introduction

Building 8 is the boiler house building associated with the William Jennings Bryan Dorn Veterans Affairs Medical Center (V.A. Medical Center). There is also an incinerator room attached to the northeast corner of Building 8 that was recently added. This building has four boilers that service most all the V.A. Medical Center owned buildings including buildings leased by the University of South Carolina. Building 8 is located on Medical School Avenue in Columbia, South Carolina.

This survey was conducted to assess the current condition of asbestos containing materials (ACM) identified in previous asbestos survey reports and asbestos abatement reports provided by the V.A. Medical Center. In addition to the assessment, ARM was also instructed to inspect, assess and sample for suspect ACM not identified in previous reports. The new and previous data was then to be compiled, to provide a current state-of-the-art asbestos survey report. This survey was conducted in accordance with the Asbestos Hazard Emergency Response Act (AHERA) guidelines, as required by Environmental Protection Agency (EPA) and the South Carolina Department of Health and Environmental Control (SCDHEC).

Building Description

Building 8 is a two-story brick structure. It was built in the early 1930's according to V.A. Medical Center personnel. An addition, the new incinerator room, was added to the northeast corner of Building 8 in the 1990's. Building 8 has approximately 11,000 square feet of floor space including the new incinerator room.

Listed below are the primary functional areas that make up Building 8 and a list of suspect materials observed during the walkthrough (material assessment includes materials identified from previous asbestos surveys and other documentation provided to ARM by the V.A. Medical Center).

EXTERIOR AND ROOF ASSESSMENT

Exterior walls to Building 8 are primarily constructed of brick. The new incinerator room exterior walls are also covered with brick of a similar but newer style as the boiler house building. There are multiple roof levels associated with this building. All roofs viewed appeared to be flat roofs (built-up style) construction covered with rock except for the roof over the compressor room that appeared to be corrugated metal. There is also a fenced-in area with gas piping and small skylights for lower level natural lighting located on the south side.

Suspect Materials observed on the Exterior of Building 8:

• Various Seam Caulks	• Various Mastic
• Window Glazing	• Roof Materials

INTERIOR ASSESSMENT

The interior of Building 8 has a computer room and (room 101) restroom (room 102) located on a mezzanine level, a compressor room, the new incinerator room, an office/break room (with the old incinerator room below), and a hoist room, all on the upper level. The hoist room is a small brick building that connects to the boiler house on the southwest side and is used to raise or lower equipment to the engine generator room that is in the lower level of Building 8. The lower level (basement areas) consists of the engine generator room, pump room, shop with tank area, operator's room, and boiler room. Boilers 1, 2 and 3 were installed in 1967 and boiler 4 was installed in 1976 (when Buildings 100 and 103 were added to the system) according to a V.A. Medical Center engineer.

The foundation to Building 8 appears to be concrete throughout all areas. Walls are constructed of brick, concrete and concrete block. Ceilings decks are concrete except for the compressor room and new incinerator room that are constructed of metal. An underground pipe chase was found near the southeast corner of Building 8. This chase extends from the lower level of Building 8, under Medical School Avenue, and connects with Buildings 4 and 9. The pipe chase (tunnel-like) appears to be constructed of concrete. Pipe insulation viewed in the chase appeared to be homogeneous with piping found in Building 8. There is access to the pipe chase from the lower level of Building 8 and also an access door located on the side of a raised walkway on the south side of Building 9.

Insulation viewed on most piping and equipment is non-suspect calcium-silicate or fiberglass materials, mineral wool, non-suspect jacketing and mostly plastic elbows on piping. Vibration damping collars viewed are non-suspect rubber and nylon materials.

Suspect Materials observed throughout the interior areas of Building 8:

<ul style="list-style-type: none">• Floor Tiles and Mastics• Thermal System Insulation (TSI)• Interior Window Glazing• Gasket Material• 1' Ceiling Tile	<ul style="list-style-type: none">• Various Seam Caulks• Penetration Sealant• Acoustical Sink Mastics• Fire Brick
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Scope of Survey

After review of previous asbestos assessment and abatement data provided by the VA Medical Center, and a walkthrough of the building to search for unidentified suspect materials, ARM conducted a sampling survey of accessible building materials. Bulk samples for these buildings were collected February 8, 2005. Samples of suspect ACM were collected in accordance with general EPA guidelines by a licensed SCDHEC asbestos building inspector, and then forwarded to a NVLAP accredited laboratory for analysis. A chain of custody form was filled out and sent with the samples to the laboratory. All samples of each suspect ACM has been analyzed by polarized light microscopy (PLM) in accordance with 40 CFR Part 763 Appendix B to Subpart F.

Assumed Asbestos Containing Materials (ACMs)

For the purpose of this report, certain building materials will be assumed to contain asbestos due to limited accessibility, damage to equipment or warranty concerns. These materials should either be properly tested or treated as ACM prior to demolition or renovations of these materials. Below in bold are the assumed materials for Building 8:

- **Mechanical and electrical equipment** were not opened or dismantled and therefore were not inspected internally as a part of this report due to safety concerns or damage to the equipment.
- **Fire doors** were not dismantled to inspect interior insulation that typically contains asbestos.

Summaries / Recommendations

The following table includes a summary of ACMs identified in the 1992 Cape Environmental Management, Inc. (CEM) asbestos survey. This summary is limited to ACMs that could be verified during the current survey. In some cases, the ACM quantities have been revised, based on observations made during the current survey.

Table 1: ACM Data From The July 1992 CEM Asbestos Report

ACM	Material Location	Approximate Quantity
9" Floor Tile and Mastic	Computer Room, Mezzanine Level	110 SF
Pink Acoustical Sink Mastic	Controller's Room, Lower Level	1 Sink
Black Acoustical Sink Mastic	Controller's Room, Lower Level	1 Sink (<1% Asbestos)
Fire Door Insulation	Throughout Building 8	See Assumed ACM
Roof Flashing, Black	Roofs	110 SF
Roof Flashing, Gray	Parapet Wall on Roof	225 SF

The following table includes a summary of ACMs identified in the December 2004 asbestos surveys.

**Table 1A: ACM Data From The December 2004 V.A. Medical Center
Asbestos Reports**

ACM	Material Location	Approximate Quantity
Pipe TSI	Shop Area, Lower Level	1 LF
Tank TSI	Shop Area, Lower Level	250 SF
#3 Boiler Flue TSI	Insulation between #3 Boiler and the associated Smoke Stack	9 SF

The following table is a summary of ACMs identified in the current asbestos inspection conducted by ARM.

Table 2: ACM Data From the Current ARM Asbestos Survey

ACM	Material Location	Approximate Quantity
Boiler TSI	Boiler Bodies of all Four Boilers (under metal jacket)	2,600 SF
Penetration Sealant	Pump Room, Right of Tunnel, Southeast Corner on Wall	2 LF
Flue Gasket	#1 and #2 Boilers Stacks	20 LF
Black / Gray Mastic Sealant	Exterior South, On Skylights in Fenced-in Gas Pipe Compound	35 LF
Door Frame Caulk (<1% Asbestos)*	Exterior Frames	Not Quantified

***Asbestos Content:** USEPA and SCDHEC regulations (No. 61-86.1) define asbestos containing material as any material greater than one percent asbestos. OSHA regulations (29 CFR 1910.1001) define asbestos containing material as any material with a detectable concentration of asbestos. OSHA recommends that a negative exposure assessment (NEA) be conducted to establish appropriate personal protection equipment needed (if any) for all persons that might disturb asbestos materials.

Current assessment of all ACM, and analytical results are compiled in Table 3, in the Appendix of this report. In the event that any suspect asbestos containing materials that were not addressed in this survey are encountered (i.e. inaccessible areas, pipe insulation in hidden chases, or material found in mechanical systems), the materials should be presumed to contain asbestos or be properly inspected by a SCDHEC licensed asbestos inspector. The results of this survey are limited to previous information provided to ARM by the V.A. Medical Center and the sampled materials, which are considered to be representative of the homogenous areas from which the samples were collected.

Current SCDHEC Regulation No. 61-86.1 requires that all buildings scheduled for renovation or demolition with asbestos survey reports more than three-years old, will need to be re-inspected by a licensed asbestos building inspector.

Warranty

ARM warrants that the findings contained herein have been prepared in general accordance with accepted professional practices as applied by similar professionals in the community at the time of its preparation. Changes in the state of the art or in applicable regulations cannot be anticipated and have not been addressed in this report. The field and laboratory results reported herein are considered sufficient in detail and scope to determine the presence of accessible and/or exposed suspect asbestos containing materials at the time of the inspection. Test results are valid only for the materials tested. There is a distinct possibility that conditions may exist which could not be identified within the scope of study or which were not apparent during the site visit. This inspection covered only those materials, which were exposed and/or accessible to the inspector. Previous asbestos survey reports, assessments and other information provided to ARM by the V.A. Medical Center and USC, that is incorporated into our report, is not warranted. No other warranties are implied or expressed.

TABLE 3
CURRENT ASBESTOS SURVEY DATA SHEET

Project Name:	William Jennings Bryan Dorn Veterans Affairs Medical Center Building 8	Inspector:	Benjamin M. Craig
Location:	Veterans Affairs Medical Center Columbia, South Carolina	Accreditation #:	BI-00345
Date(s) of Inspection:	February 8, 2005	Location:	South Carolina
		Assistant(s):	None

Analytical Data presented in Table 3 includes new sample collection and assessment and previous data compiled from the July 1992 Report (Volumes II and IV) conducted by Cape Environmental Management, Inc. and bulk sample collection by the V.A. Medical Center in December 2004

Material Description	Homogeneous Locations	Sample # and Extraction Location	Asbestos Content ³	Category ¹ (F/NF)	Condition ² (G/D/SD)	Approx. Amount
9" Floor Tile (from July 1992 Report Vol. II & IV)	Computer Room, Mezzanine Level	8-1-01 - Floor Tile 8-1-02 - Floor Tile 8-1-03 - Floor Tile	<1% Chrysotile Asbestos			
Mastic Under 9" Floor Tile (from July 1992 Report Vol. II & IV)	Computer Room, Mezzanine Level	8-1-01 - Mastic 8-1-02 - Mastic 8-1-03 - Mastic	10% Chrysotile Asbestos	NF	G	110 SF
12" Gray Floor Tile (from July 1992 Report Vol. II & IV)	Restroom	8-2-01 - Tile 8-2-02 - Tile 8-2-03 - Tile	No Asbestos Detected			

Category¹: F=Friable; NF=Non-Friable
Condition²: G=Good; D=Damaged; SD=Significantly Damaged
Asbestos Content³: USEPA and SCDHEC regulations (No. 61-86.1) define asbestos containing material as any material greater than one percent asbestos. OSHA regulations (29 CFR 1910.1001) define asbestos containing material as any material with a detectable concentration of asbestos. OSHA recommends that a negative exposure assessment (NEA) be conducted to establish appropriate personal protection equipment needed (if any) for all persons that might disturb asbestos materials.

Inaccessible Material (IM) = Not All Material Viewable to Quantify

Material Description	Homogeneous Locations	Sample # and Extraction Location	Asbestos Content ³	Category ¹ (F/NF)	Condition ² (G/D/SD)	Approx. Amount
Mastic Under 12" Gray Floor Tile (from July 1992 Report Vol. II & IV)	Restroom	8-2-01 - Mastic 8-2-02 - Mastic 8-2-03 - Mastic	No Asbestos Detected			
1' Ceiling Tile (from July 1992 Report Vol. II & IV)	Computer Room, Mezzanine Level	8-3-01 8-3-02 8-3-03	No Asbestos Detected			
Pink Acoustical Sink Mastic (from July 1992 Report Vol. II & IV)	Controller's Room, Lower Level	8-4-01 8-4-02	2% Chrysotile Asbestos	NF	G	1 Sink
Black Acoustical Sink Mastic (from July 1992 Report Vol. II & IV)	Controller's Room, Lower Level	8-5-01 8-5-02	<1% Chrysotile Asbestos			
Fire Doors (from July 1992 Report Vol. II & IV)	Throughout Building 8	N/A	Assumed Asbestos Containing	N/A	G	IM
Black Roof Flashing (from July 1992 Report Vol. II & IV)	Roofs	8-7-01 8-7-02 8-7-03	5% Chrysotile Asbestos	NF	G	110 SF
Gray Roof Flashing (from July 1992 Report Vol. II & IV)	Roof at Parapet Wall	8-8-01 8-8-02 8-8-03	30% Chrysotile Asbestos	NF	G	225 SF
Flat Roof (from July 1992 Report Vol. II & IV)	Built-up Roof under Rock	8-9-01 8-9-02 8-9-03	No Asbestos Detected			
Pipe and Tank TSI (from December 2004, VA Medical Center Reports)	Throughout Lower Level	Samples: J-56, 57, 58, 60, 61, 62, 63, 64, 65, 66	No Asbestos Detected			
Pipe TSI (from December 2004, VA Medical Center Reports)	Shop Area, Lower Level	Sample: J-59	5% Chrysotile Asbestos	F	G	1 LF
End Cap TSI (from December 2004, VA Medical Center Reports)	Shop Area, Lower Level on Tank	Sample: J-67	3% Chrysotile Asbestos	F	G	250 SF

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Inaccessible Material (IM) = Not All Material Viewable to Quantify

Material Description	Homogeneous Locations	Sample # and Extraction Location	Asbestos Content ³	Category ¹ (F/NF)	Condition ² (G/D/SD)	Approx. Amount
Pipe, Stack, Tank and Flue (Boiler #4) TSI (from December 2004, VA Medical Center Reports)	Throughout Lower Level	Samples: B1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20	No Asbestos Detected			
Flue TSI on Boiler #3 (from December 2004, VA Medical Center Reports)	Between Boiler #3 and Stack (on boilers #1 and #2 also)	Sample: B6	10% Chrysotile Asbestos	F	SD	30 SF
12" Pipe TSI	Overhead above #4 boiler	VAH8-01B – Over #4 boiler (blue)	No Asbestos Detected			
Stack TSI	Stack associated with #4 boiler	VAH8-02B – Over #4 boiler (white)	No Asbestos Detected			
		VAH8-03B	No Asbestos Detected			
6" Pipe TSI	Throughout Boiler Room, Overhead	VAH8-04B – Between #3 & 4 boilers VAH8-06B – Between #3 & 4 boilers VAH8-10B – At #4 boiler & coal shoot VAH8-11B – At #4 boiler & coal shoot VAH8-16B – Between #1 & 2 boilers VAH8-17B – Between #1 & 2 boilers VAH8-18B – at west side roll-up door near #2 boiler	No Asbestos Detected			
4" Pipe TSI	Throughout Boiler Room	VAH8-05B – Front & top of #4 boiler VAH8-13B – Rear & bottom of #4 boiler	No Asbestos Detected			
Valve End Cap and Valve Body TSI	Over #3 Boiler	VAH8-07B VAH8-08B	No Asbestos Detected			
Boiler Body TSI	Under Metal Skin (Boiler #4 Assumed Asbestos Containing)	VAH8-09B – Top of #3 Boiler VAH8-19B – Top of #2 Boiler VAH8-20B – Top of #1 Boiler	10% Chrysotile Asbestos	F	G	2,600 SF (all 4)
Pipe End Cap TSI	Over #3 Boiler	VAH8-12B – Overhead at #4 boiler & coal shoot	No Asbestos Detected			
Main Steam Header End Cap TSI	Near East Wall, Center	VAH8-14B – Right End Cap VAH8-15B – Left End Cap	No Asbestos Detected			

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Inaccessible Material (IM) = Not All Material Viewable to Quantify

Material Description	Homogeneous Locations	Sample # and Extraction Location	Asbestos Content ³	Category ¹ (F/NF)	Condition ² (G/D/SD)	Approx. Amount
Muffler TSI	Engine Generator (EG) Muffler	VAH8-21B – Elbow over EG VAH8-22B – Straight Run over EG VAH8-23B – End Cap over EG VAH8-24B – Muffler Body VAH8-25B – Straight Run after Muffler	No Asbestos Detected			
Lower Boiler TSI at Seam	#2 Boiler Seam at Lower Front Hatch	VAH8-26B	No Asbestos Detected			
10" Pipe TSI Covering over Fiberglass TSI	Pump Room at Entrance to Tunnel	VAH8-27B – Upper Pipe Covering VAH8-28B – Lower Pipe Covering VAH8-51B – Entrance to Tunnel between Bldgs #4 and #9	No Asbestos Detected			
Penetration Sealant (black but painted silver)	Pump Room, Right of Tunnel	VAH8-29B	15% Chrysotile Asbestos	NF	D	2 LF
Fire Brick	Stacked on Floor (Probably on Interiors of Boilers and Incinerators)	VAH8-30B – Pump room under steps VAH8-31B – Old Incinerator Room	No Asbestos Detected			
Interior Window Glazing	Throughout Building 8	VAH8-32B – Main Level, south window, top of steps VAH8-33B – Main Level, northeast window, top of steps	No Asbestos Detected			
Ceiling Tile Glue Daubs	Computer Room, Mezzanine Level	VAH8-34B	No Asbestos Detected			
Dark Red Penetration Sealant	Computer Room, Mezzanine Level	VAH8-35B	No Asbestos Detected			
Flue Gasket	Boiler Room	VAH8-36B	No Asbestos Detected			
Exterior Black/Gray Mastic Sealant	Around Skylights in Fenced-in Gas Pipe Area	VAH8-37B – Boiler #1 at Stack VAH8-38B – Boiler #2 at Stack VAH8-39B	60% Chrysotile Asbestos	NF	G	20 LF
Exterior Window Frame Caulk	Throughout Building 8	VAH8-40B	20% Chrysotile Asbestos	NF	G	35 LF
Exterior Black Mastic Weatherproofing	Base of Building	VAH8-41B – South side window VAH8-42B – West side window near Compressor Room VAH8-43B – at Rear Door VAH8-44B – Northwest Corner of Compressor Room	No Asbestos Detected			
			No Asbestos Detected			

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Inaccessible Material (IM) = Not All Material Viewable to Quantify

Material Description	Homogeneous Locations	Sample # and Extraction Location	Asbestos Content ³	Category ¹ (F/NF)	Condition ² (G/D/SD)	Approx. Amount
Exterior Door Frame Caulk	Throughout Building 8	VAH8-45B – Rear Door Frame VAH8-46B – Double Door at Compressor Room	<1% Chrysotile Asbestos			
Exterior Window Glazing	Throughout Building 8	VAH8-47B – West Side Windows VAH8-48B – East Side Windows	No Asbestos Detected			
Base Mastic	Old Incinerator Room Floor	VAH8-49B VAH8-50B	No Asbestos Detected			

Category¹: F=Friable; NF=Non-Friable

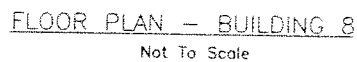
Condition²: G=Good; D=Damaged; SD=Significantly Damaged

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Inaccessible Material (IM) = Not All Material Viewable to Quantify

Red Locations Indicate Sample Extractions From The January 2005 Report Compiled By ARM Environmental Serv.

W	ASBESTOS BOILER FLUE GASKET
—	ASBESTOS BOILER FLUE INSULATION
■	ASBESTOS ACOUSTICAL MASTIC ON SINK



LEGEND



ASBESTOS MASTIC UNDER 9" TILE.
TILE CONTAINS <1% ASBESTOS



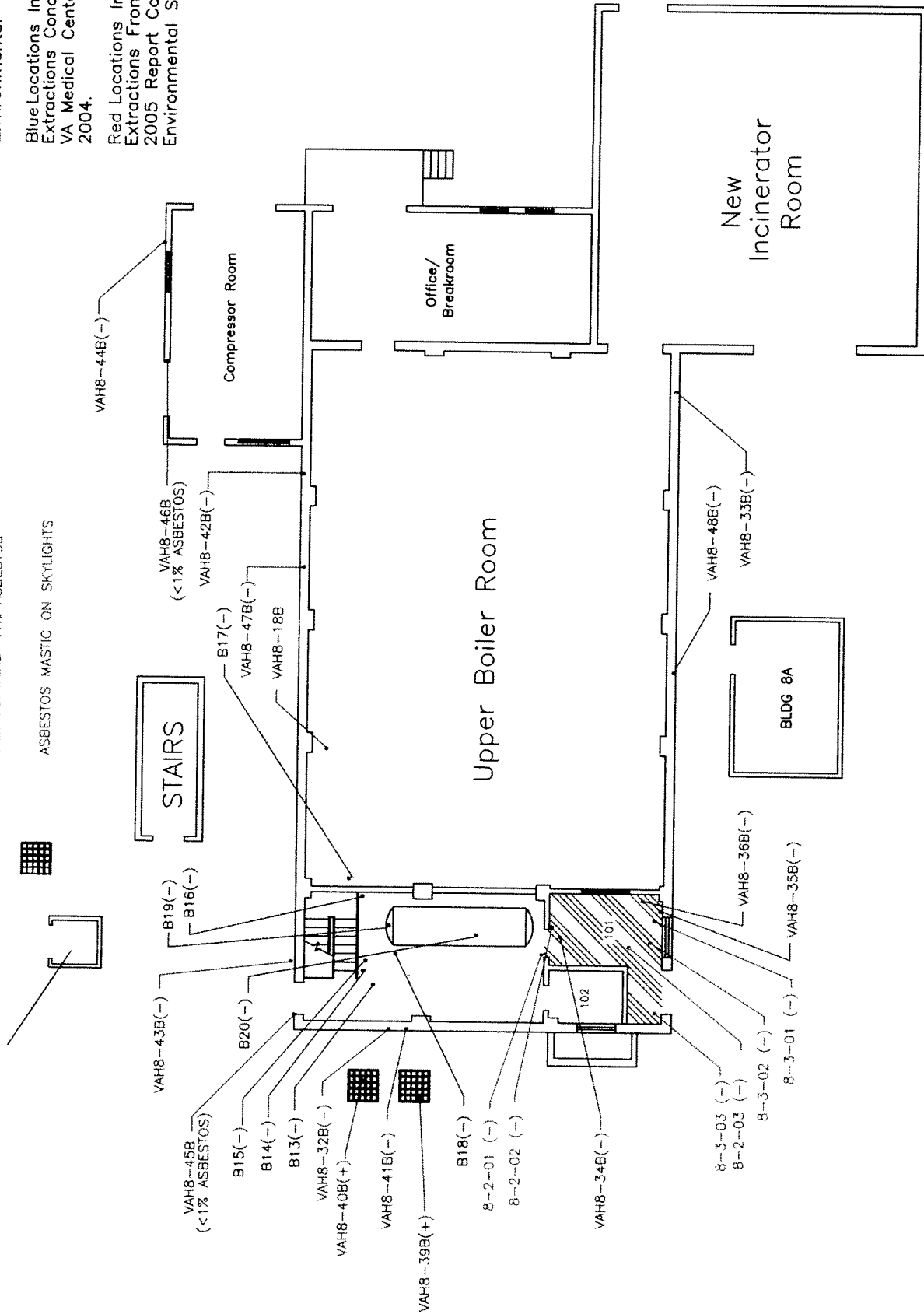
ASBESTOS MASTIC ON SKYLIGHTS

Hoist Room

Green Locations Indicate Sample Extractions From The July 1992 Report Compiled By Cape Environmental

Blue Locations Indicate Sample Extractions Conducted By The VA Medical Center In December 2004.

Red Locations Indicate Sample Extractions From The January 2005 Report Compiled By ARM Environmental Serv.



MEZZANINE PLAN - BUILDING 8

Not To Scale

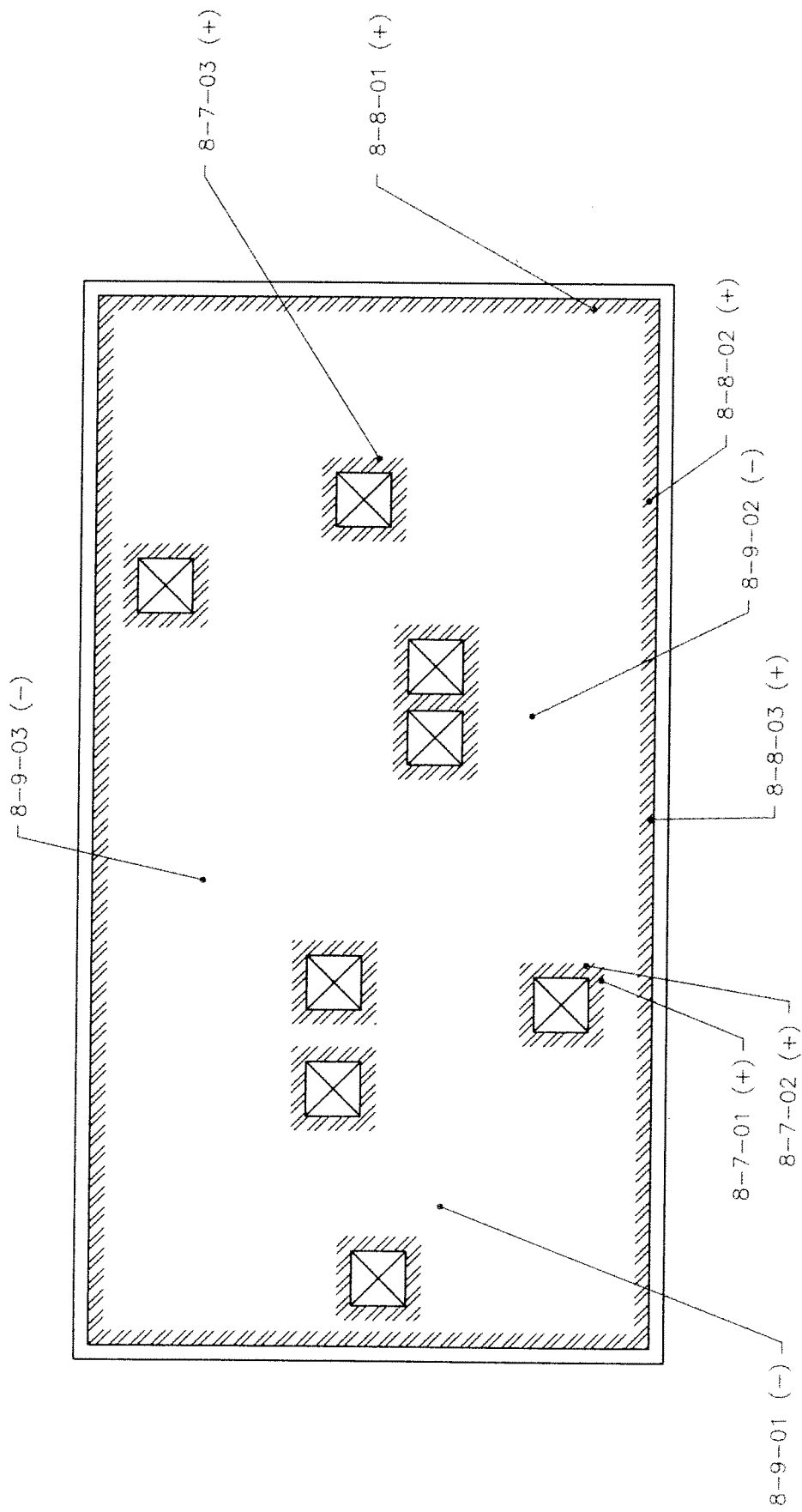


LEGEND



GRAY OR BLACK ASBESTOS FLASHING

Green Locations Indicate Sample Extractions From The July 1992 Report Compiled By Cape Environmental



ROOF PLAN - BUILDING 8

Not To Scale





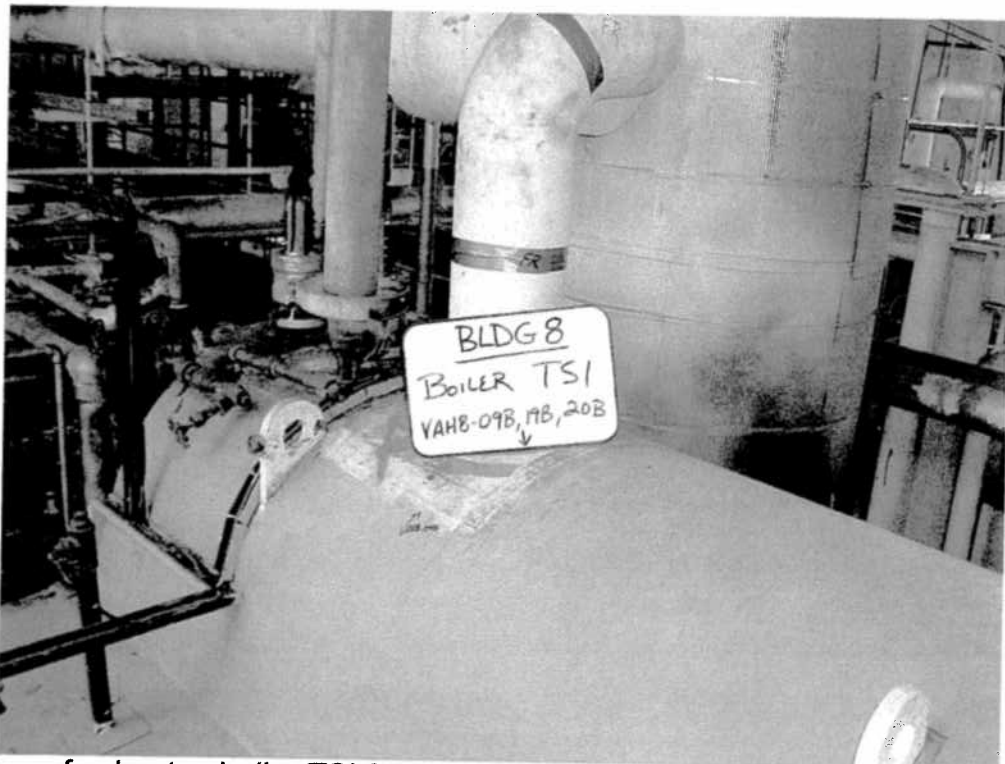
- 1) View of Building 8 looking west from Medical School Avenue. Building 8A is the gray metal building in front of Building 8.



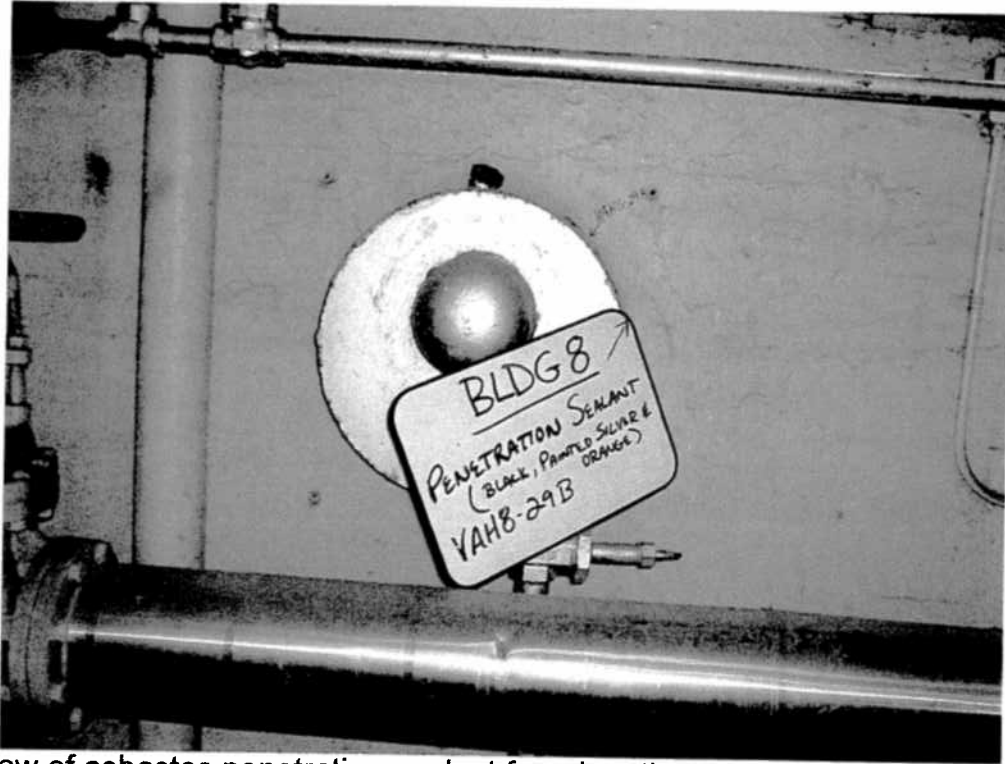
- 2) View of Building 8 looking east. The new incinerator room is the building to the left with a large smoke stack.



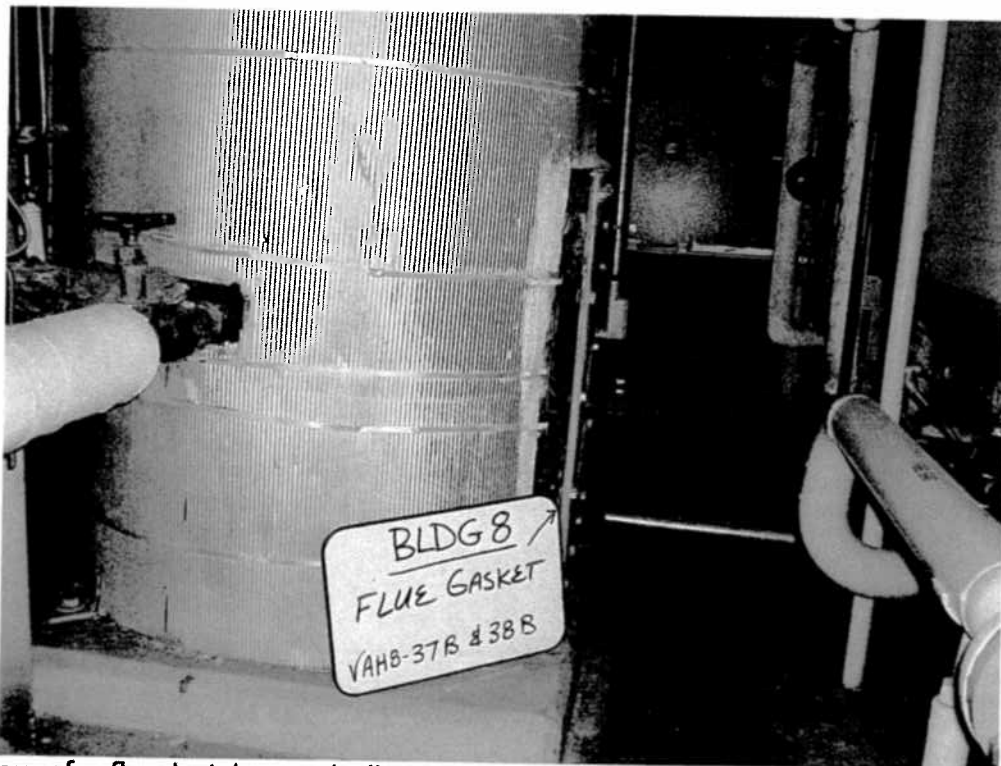
- 3) View of asbestos black/gray exterior weatherproofing around skylights located on the south side of Building 8 in the fenced-in gas pipe compound.



- 4) View of asbestos boiler TSI found on top of a boiler in Building 8. TSI under the metal skin of all boilers is assumed to be the same material unless laboratory analysis determines it to be non-ACM.



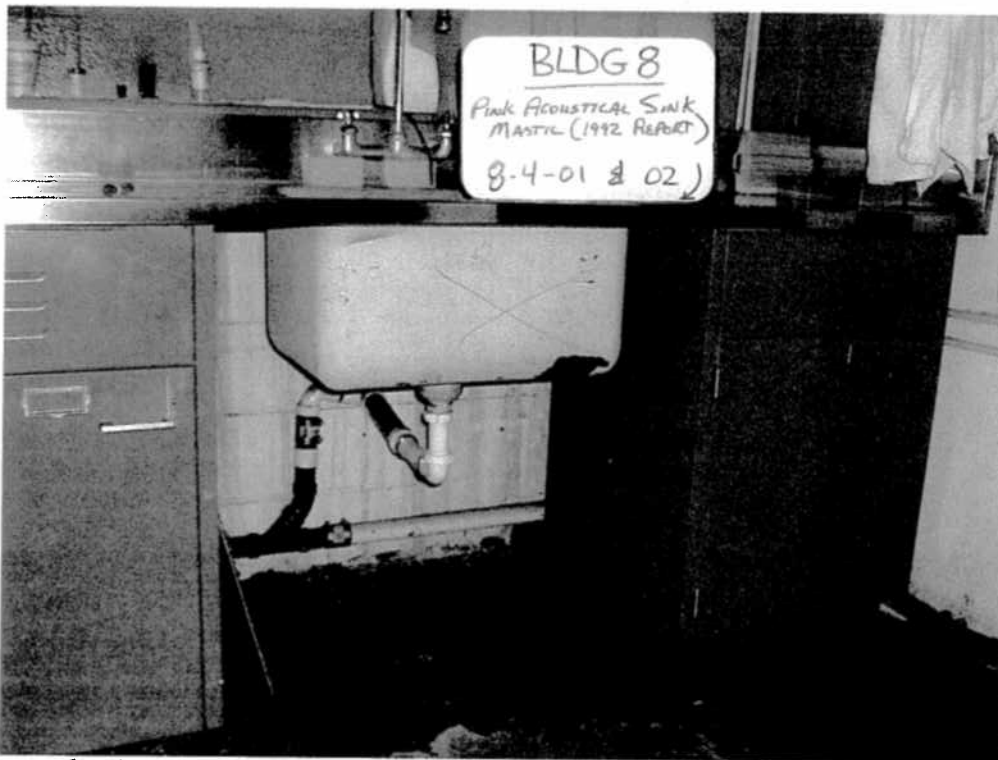
5) View of asbestos penetration sealant found on the south wall in the pump room of Building 8.



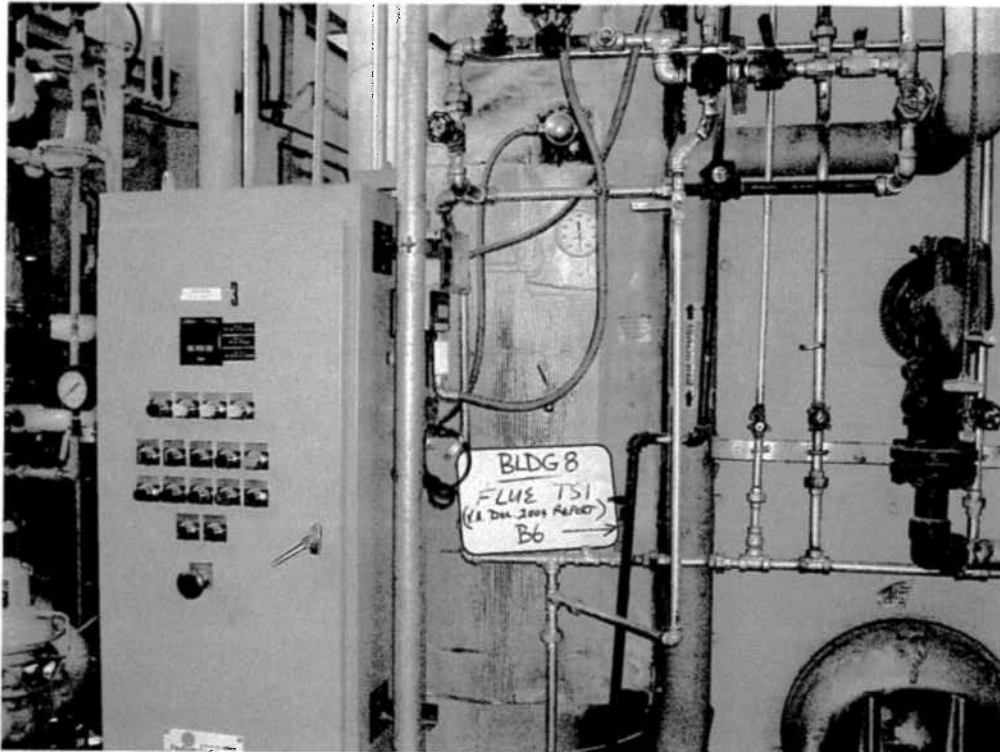
6) View of a flue hatch on a boiler stack with an asbestos gasket in Building 8. These gaskets were found on the stacks for boiler #1 and boiler #2 only.



- 7) View of asbestos 9" floor tile (less than one percent asbestos) found in Building 8 during a 1992 inspection. Mastic is 10 percent asbestos.



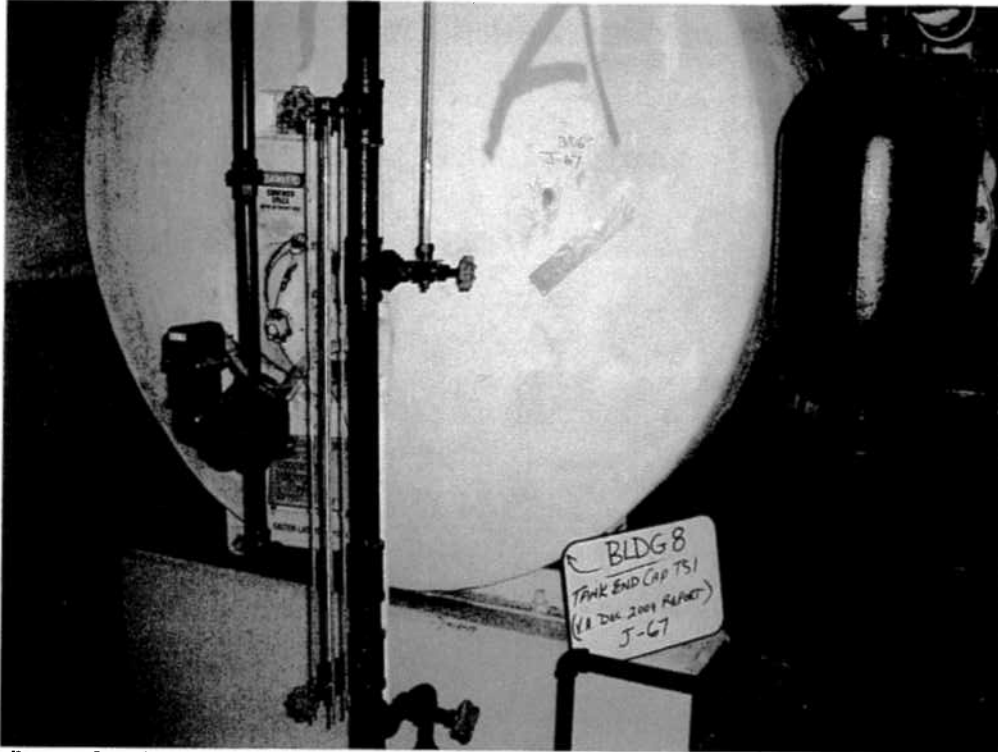
- 8) View of asbestos, pink acoustical sink mastic found in the controller's room in Building 8 during a 1992 inspection.



- 9) View of asbestos TSI (painted orange) on a flue between a boiler and a boiler stack in Building 8. This material was found on boilers #1, #2 and #3.



- 10) View of asbestos pipe TSI found in the tank area adjacent to the workshop in Building 8 during a December 2004 inspection conducted by the V.A. Medical Center.



- 11) View of asbestos end cap and tank TSI found on the tank located near the workshop in Building 8 during a December 2004 inspection conducted by the V.A. Medical Center.

Appendix A

Laboratory Data

EMSL Analytical, Inc.

1101-A Aviation Parkway, Morrisville, NC 27560

Phone: (919) 465-3900 Fax: 9194653950 Email: raleighlab@emsl.com

Attn: **Gail Cruz**
ARM Environmental Services, Inc.
1210 1st Street South Extension
Columbia, SC 29209

Fax: (803) 783-2587 Phone: (803) 783-3314
Project: **V.A. Hospital / 09-102-04**

Customer ID: ARM62
Customer PO: 09-102-04
Received: 02/09/05 10:27 AM
EMSL Order: 290500285

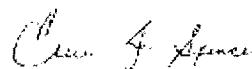
EMSL Proj:
Analysis Date: 2/9/2005
Report Date: 5/31/2005

Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Location	Appearance	Non-Asbestos		Asbestos	
			% Fibrous	% Non-Fibrous	% Type	
VAH8-01B 290500285-0001	12" Pipe TSI	Tan Fibrous Heterogeneous	15% Glass 35% Cellulose	50% Matrix		None Detected
VAH8-02B 290500285-0002	12" Pipe TSI	Tan Fibrous Heterogeneous	20% Glass 30% Cellulose	50% Matrix		None Detected
VAH8-03B 290500285-0003	Stack TSI	Tan/Brown Fibrous Heterogeneous	10% Synthetic 10% Glass 25% Cellulose	55% Matrix		None Detected
VAH8-04B 290500285-0004	6" Pipe TSI	Tan/Beige Fibrous Heterogeneous	25% Glass 25% Cellulose	50% Matrix		None Detected
VAH8-05B 290500285-0005	4" Pipe TSI	Tan/Beige Fibrous Heterogeneous	15% Glass 35% Cellulose	50% Matrix		None Detected
VAH8-06B 290500285-0006	6" Pipe TSI	Tan/Beige Fibrous Heterogeneous	15% Glass 30% Cellulose	55% Matrix		None Detected
VAH8-07B 290500285-0007	Valve End Cap TSI	Gray/Black/White Fibrous Heterogeneous	25% Glass 10% Cellulose	65% Matrix		None Detected

Analyst(s)

Essie Spencer (51)



or other approved signatory

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Analysis performed by EMSL Raleigh (NVLAP #200671-0)

EMSL Analytical, Inc.

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1210 1st Street South Extension
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Phone: (803) 783-3314

Project: **V.A. Hospital / 09-102-04**

Customer ID: ARM62
Customer PO: 09-102-04
Received: 02/09/05 10:27 AM
EMSL Order: 290500285

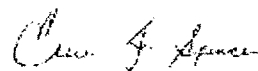
EMSL Proj:
Analysis Date: 2/9/2005
Report Date: 5/31/2005

Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Location	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
VAH8-08B 290500285-0008	Valve End Cap TSI	Tan/Gray Fibrous Heterogeneous	10% Min. Wool 5% Glass 35% Cellulose	50% Matrix	None Detected
VAH8-09B 290500285-0009	Boiler TSI	Tan/Silver Fibrous Heterogeneous	10% Min. Wool 20% Glass 20% Cellulose	42% Matrix	8% Chrysotile
VAH8-10B 290500285-0010	6" Pipe TSI	White/Brown/Silver Fibrous Heterogeneous	10% Glass 35% Cellulose	55% Matrix	None Detected
VAH8-11B 290500285-0011	6" Pipe TSI	Brown/White/Silver Fibrous Heterogeneous	20% Glass 40% Cellulose	40% Matrix	None Detected
VAH8-12B 290500285-0012	Pipe End Cap TSI	Tan/White Fibrous Heterogeneous	10% Glass 35% Cellulose	55% Matrix	None Detected
VAH8-13B 290500285-0013	4" Pipe TSI	Tan Fibrous Heterogeneous	20% Glass 30% Cellulose	50% Matrix	None Detected
VAH8-14B 290500285-0014	Steam Header End Cap TSI	Tan Fibrous Heterogeneous	25% Min. Wool 15% Glass 10% Cellulose	50% Matrix	None Detected

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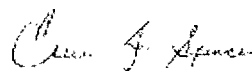
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Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Location	Appearance	Non-Asbestos			Asbestos
			%	Fibrous	% Non-Fibrous	% Type
VAH8-15B 290500285-0015	Steam Header End Cap TSI	White/Gray Fibrous Heterogeneous	20% 20% 30%	Min. Wool Glass Cellulose	30% Matrix	None Detected
VAH8-16B 290500285-0016	6" Pipe TSI	White/Green Fibrous Heterogeneous	20% 30%	Glass Cellulose	50% Matrix	None Detected
VAH8-17B 290500285-0017	6" Pipe TSI	Beige Fibrous Heterogeneous	10% 35%	Glass Cellulose	55% Matrix	None Detected
VAH8-18B 290500285-0018	6" Pipe TSI	Tan/Beige Fibrous Heterogeneous	15% 35%	Glass Cellulose	50% Matrix	None Detected
VAH8-19B 290500285-0019	Boiler TSI	Tan/Brown Fibrous Heterogeneous	15% 5% 10%	Min. Wool Glass Cellulose	60% Matrix	10% Chrysotile
VAH8-20B 290500285-0020	Boiler TSI	Tan/Gray Fibrous Heterogeneous	20% 20% 10%	Min. Wool Glass Cellulose	50% Matrix	None Detected
VAH8-21B 290500285-0021	Elbow On Muffler	Tan/Gray/White Fibrous Heterogeneous	20% 5% 25%	Min. Wool Glass Cellulose	50% Matrix	None Detected

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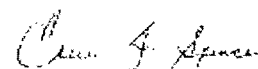
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Sample	Location	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
VAH8-22B 290500285-0022	Straight Run On Muffler	Tan/Gray/Silver Fibrous Heterogeneous	5% Glass 35% Cellulose	60% Matrix	None Detected
VAH8-23B 290500285-0023	End Cap On Muffler	Tan/Gray Fibrous Heterogeneous	10% Min. Wool 20% Glass 30% Cellulose	40% Matrix	None Detected
VAH8-24B 290500285-0024	Muffler TSI	White/Silver Fibrous Heterogeneous	5% Min. Wool 40% Cellulose	55% Matrix	None Detected
VAH8-25B 290500285-0025	Straight Run On Muffler	Tan/Brown/Silver Fibrous Heterogeneous	5% Glass 40% Cellulose	55% Matrix	None Detected
VAH8-26B 290500285-0026	Boiler TSI At Seam	Silver/Brown Fibrous Heterogeneous	10% Glass 5% Cellulose	85% Matrix	None Detected
VAH8-27B 290500285-0027	10" Pipe TSI	Tan/Beige Fibrous Heterogeneous	20% Min. Wool 25% Cellulose	55% Matrix	None Detected
VAH8-28B 290500285-0028	10" Pipe TSI	Tan/Beige Fibrous Heterogeneous	5% Min. Wool 20% Glass 25% Cellulose	50% Matrix	None Detected

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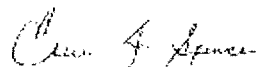
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Sample	Location	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
VAH8-29B 290500285-0029	Penetration Sealant	Black/Brown/Silver Fibrous Heterogeneous	10% Glass 20% Cellulose	55% Matrix	15% Chrysotile
VAH8-30B 290500285-0030	Fire Brick	Tan/Beige Fibrous Heterogeneous	3% Glass 5% Cellulose	92% Matrix	None Detected
VAH8-31B 290500285-0031	Fire Brick	Tan/Beige Fibrous Heterogeneous	2% Glass 6% Cellulose	92% Matrix	None Detected
VAH8-32B 290500285-0032	Interior Window Glazing	Tan/Brown Fibrous Heterogeneous	2% Wollastonite 5% Cellulose	93% Matrix	None Detected
VAH8-33B 290500285-0033	Interior Window Glazing	Tan/Brown Fibrous Heterogeneous	3% Wollastonite 5% Cellulose	92% Matrix	None Detected
VAH8-34B 290500285-0034	Glue Dalibs	Brown Fibrous Heterogeneous	2% Synthetic 5% Cellulose	93% Matrix	None Detected
VAH8-35B 290500285-0035	Glue Dalibs	Brown Fibrous Heterogeneous	2% Synthetic 5% Cellulose	93% Matrix	None Detected
VAH8-36B 290500285-0036	Red Penetration Sealant	Red Fibrous Heterogeneous	5% Synthetic 15% Glass 5% Cellulose	75% Matrix	None Detected

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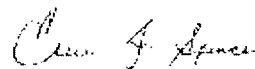
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Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

Sample	Location	Appearance	Non-Asbestos		Asbestos	
			% Fibrous	% Non-Fibrous	% Type	
VAH8-37B 290500285-0037	Flue Gasket	Tan Fibrous Heterogeneous	5% Synthetic 10% Cellulose	35% Matrix	50% Chrysotile	
VAH8-38B 290500285-0038	Flue Gasket	Tan/Brown Fibrous Heterogeneous	5% Synthetic 20% Cellulose	15% Matrix	60% Chrysotile	
VAH8-39B 290500285-0039	Weather Proofing	Black/Gray Fibrous Heterogeneous	5% Synthetic 20% Cellulose	55% Matrix	20% Chrysotile	
VAH8-40B 290500285-0040	Weather Proofing				Not Analyzed	
VAH8-41B 290500285-0041	Exterior Window Frame Caulk	Gray/Tan Fibrous Heterogeneous	3% Wollastonite 2% Synthetic 5% Cellulose	90% Matrix	None Detected	
VAH8-42B 290500285-0042	Exterior Window Frame Caulk	Gray/Tan Fibrous Heterogeneous	3% Wollastonite 2% Synthetic 5% Cellulose	90% Matrix	None Detected	
VAH8-43B 290500285-0043	Weather Proofing	Black/Brown Fibrous Heterogeneous	50% Synthetic 10% Cellulose	40% Matrix	None Detected	

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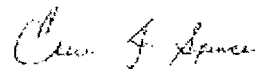
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Sample	Location	Appearance	Non-Asbestos		Asbestos
			% Fibrous	% Non-Fibrous	% Type
VAH8-44B 290500285-0044	Weather Proofing	Black/Brown Fibrous Heterogeneous	10% Synthetic 30% Cellulose	60% Matrix	None Detected
VAH8-45B 290500285-0045	Door Frame Caulk	Brown/White Fibrous Heterogeneous	2% Synthetic 8% Cellulose	90% Matrix	<1% Chrysotile
VAH8-46B 290500285-0046	Door Frame Caulk	Brown/White Fibrous Heterogeneous	2% Synthetic 8% Cellulose	90% Matrix	<1% Chrysotile
VAH8-47B 290500285-0047	Exterior Window Glazing	Black/Brown Fibrous Heterogeneous	10% Wollastonite 10% Cellulose	80% Matrix	None Detected
VAH8-48B 290500285-0048	Exterior Window Glazing	Black/Brown Fibrous Heterogeneous	10% Wollastonite 10% Cellulose	80% Matrix	None Detected
VAH8-49B 290500285-0049	Base Mastic	Black/Brown Fibrous Heterogeneous	2% Synthetic 8% Cellulose	90% Matrix	None Detected
VAH8-50B 290500285-0050	Base Mastic	Black/Brown Fibrous Heterogeneous	2% Synthetic 8% Cellulose	90% Matrix	None Detected
VAH8-51B 290500285-0051	10" Pipe TSI	White Fibrous Heterogeneous	10% Synthetic 25% Hair 25% Cellulose	40% Matrix	None Detected

Analyst(s)

Essie Spencer (51)



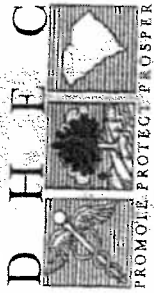
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Analysis performed by EMSL Raleigh (NVLAP #200671-0)

Appendix B

Inspector License



Bureau of Air Quality



ASBESTOS ABATEMENT LICENSE

No. BI-00345

This certifies that

BENJAMIN CRAIG

251-BI-3048

doing business as **ARM ENVIRONMENTAL SERVICES**

has satisfactorily completed the training required by South Carolina Regulation No. 61-86.1 and the EPA Model Accreditation Plan, 40 CFR 763 Subpart E Appendix C, for the category of

Consultant / Building Inspector

The holder of this license shall comply with all the requirements of said Regulation.

This License, License Number, or any Representation thereof, is not transferable to any other licensee or company.

Use of this License is only authorized for the licensee and Company whose name appears hereon and shall expire one year from

July 08, 2004

August 13, 2004

Richard D. Sharpe

Richard D. Sharpe, Director
Air Compliance Management Division
Bureau of Air Quality
South Carolina Department of Health & Environmental Control

August 13, 2004 03:42 PM

ORIGINAL

CR-001126

- **Mechanical and electrical equipment** were not opened or dismantled and therefore were not inspected internally as a part of this report due to safety concerns or damage to the equipment.
- **Fire doors** were not dismantled to inspect interior insulation that typically contains asbestos.

Summaries / Recommendations

The following table includes a summary of ACMs identified in the 1992 Cape Environmental Management, Inc. (CEM) asbestos survey. This summary is limited to ACMs that could be verified during the current survey. In some cases, the ACM quantities have been revised, based on observations made during the current survey.

Table 1: ACM Data From The July 1992 CEM Asbestos Report

ACM	Material Location	Approximate Quantity
9" Floor Tile and Mastic	Computer Room, Mezzanine Level	110 SF
Pink Acoustical Sink Mastic	Controller's Room, Lower Level	1 Sink
Black Acoustical Sink Mastic	Controller's Room, Lower Level	1 Sink (<1% Asbestos)
Fire Door Insulation	Throughout Building 8	See Assumed ACM
Roof Flashing, Black	Roofs	110 SF
Roof Flashing, Gray	Parapet Wall on Roof	225 SF

The following table includes a summary of ACMs identified in the December 2004 asbestos surveys.

**Table 1A: ACM Data From The December 2004 V.A. Medical Center
Asbestos Reports**

ACM	Material Location	Approximate Quantity
Pipe TSI	Shop Area, Lower Level	1 LF
Tank TSI	Shop Area, Lower Level	250 SF
#3 Boiler Flue TSI	Insulation between #3 Boiler and the associated Smoke Stack	9 SF

The following table is a summary of ACMs identified in the current asbestos inspection conducted by ARM.

Table 2: ACM Data From the Current ARM Asbestos Survey

ACM	Material Location	Approximate Quantity
Boiler TSI	Boiler Bodies of all Four Boilers (under metal jacket)	2,600 SF
Penetration Sealant	Pump Room, Right of Tunnel, Southeast Corner on Wall	2 LF
Flue Gasket	#1 and #2 Boilers Stacks	20 LF
Black / Gray Mastic Sealant	Exterior South, On Skylights in Fenced-in Gas Pipe Compound	35 LF
Door Frame Caulk (<1% Asbestos)*	Exterior Frames	Not Quantified

***Asbestos Content:** USEPA and SCDHEC regulations (No. 61-86.1) define asbestos containing material as any material greater than one percent asbestos. OSHA regulations (29 CFR 1910.1001) define asbestos containing material as any material with a detectable concentration of asbestos. OSHA recommends that a negative exposure assessment (NEA) be conducted to establish appropriate personal protection equipment needed (if any) for all persons that might disturb asbestos materials.

Current assessment of all ACM, and analytical results are compiled in Table 3, in the Appendix of this report. In the event that any suspect asbestos containing materials that were not addressed in this survey are encountered (i.e. inaccessible areas, pipe insulation in hidden chases, or material found in mechanical systems), the materials should be presumed to contain asbestos or be properly inspected by a SCDHEC licensed asbestos inspector. The results of this survey are limited to previous information provided to ARM by the V.A. Medical Center and the sampled materials, which are considered to be representative of the homogenous areas from which the samples were collected.

Current SCDHEC Regulation No. 61-86.1 requires that all buildings scheduled for renovation or demolition with asbestos survey reports more than three-years old, will need to be re-inspected by a licensed asbestos building inspector.