

ASBESTOS SURVEY REPORT

**STATE OF WASHINGTON
DEPARTMENT OF GENERAL ADMINISTRATION
OLYMPIA, WASHINGTON**

A.P. BUILDING (# 98)

E&AS Project #94-260



Prepared by

**PBS ENVIRONMENTAL
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**PBS Project Number
7045.21**

April 1995

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Asbestos is a naturally occurring fibrous mineral mined throughout the world. Because of its chemical and physical properties, asbestos has been used in a multitude of building materials for many years. Some uses are hundreds of years old. These materials include plaster, acoustical finishes, pipe and boiler insulations, floor coverings, adhesives, and roofing products.

Inhalation of asbestos fibers has been linked to serious lung ailments, most notably asbestosis, mesothelioma and lung cancer. Consequently, the use of asbestos in many building products has been banned since the late 1970's. However, there is no legislation requiring the removal of asbestos from buildings in which it exists. An alternative to removal is managing the asbestos in place, keeping it in good repair, and monitoring its condition. This practice can reduce or almost eliminate a potential health hazard.

The presence of asbestos does not necessarily constitute a health hazard. In order for a health hazard to exist, asbestos fibers have to be released from the material in which they are present. They must become airborne and be inhaled to pose a threat to human health. Each various asbestos-containing material has a differing potential to release fibers and pose an asbestos-related health hazard.

Friable asbestos-containing materials (ACMs) are defined as those that can be crushed, pulverized, or reduced to a powder form by hand pressure. Friable materials have a much greater ability to become airborne and thus pose the most significant threat. Non-friable materials are those that are fairly resilient to impact and degradation by normal activities (e.g. resilient floor tile). Due to the greater ease with which friable materials can release fibers, they are of greater concern. However, like non-friable materials, friable materials can be maintained in a manner that minimizes the possibility of fibers becoming airborne, thus minimizing the potential threat to occupants.

This report was prepared to identify and assess accessible asbestos-containing materials in the building. Asbestos-containing materials are identified in the Executive Summary, on the Asbestos Survey Plan drawings and in the Assessments/ Recommendations. Bulk sample analysis results can be found on the Bulk Sample Inventory and in the Laboratory Reports.

The Appendix of this asbestos survey report offers detailed information on the use of this report, understanding the information it contains, developing strategies in managing asbestos, and selecting courses of action in repairing/removing asbestos.

Building Data:

A.P. Building (#98)
Washington State Capitol Campus
Olympia, WA

Client Data

State of WA General Administration
Olympia, WA

Construction Date:	1930-35	Roof Framing:	Wood
Building Area:	3,717 sf	Construction Type:	Wood
Additions:	Various Renov.'s	Heating System:	Electric/Gas

SURVEY SCOPE PBS Project #7045.00, E&AS Project #94-260

PBS Environmental provided an asbestos survey consistent with the applicable portions of the AHERA rules and compiled a report with the following information:

1. The types, general location and general condition of friable and non-friable asbestos-containing materials (ACMs) located in the building.
2. Laboratory analysis of bulk material samples (see Appendix, Page 1.3).
3. Summary and discussion of the removal and/or management of ACMs found in the structure, including prioritization of materials/areas according to assessment criteria.
4. Photo documentation of representative ACMs and any materials of high concern.
5. Floor plans indicating ACMs and bulk sample locations.
6. Quantity estimates and cost estimates for the removal and/or repair of ACMs. (Cost estimates exclude replacement materials.)
7. Laboratory and inspection personnel accreditation, chain-of-custody documents, description of analytical methods, etc.

CERTIFICATION

PBS Environmental has conducted a physical inspection of the building and compiled this report consistent with the survey scope. PBS certifies that the information is correct and accurate within the standards of professional quality and contractual obligations.

Stephen E. Minassian
Project Manager


Signature Date
AHERA Certificate #RF-94-3980

Timothy J. Ogden
Prime Inspector


Signature Date
AHERA Certificate #RF-94-7958

Suspect friable and non-friable asbestos-containing materials were surveyed at the A.P. Building located on the Washington State Capitol Campus, Olympia, WA by PBS Environmental in October, 1994. Accessible areas of the building, including ceiling spaces, crawl spaces, mechanical rooms, plumbing chases, attics, and other similar areas were surveyed.

Inaccessible suspect materials may exist under carpeting, in ceiling or wall cavities, elevator shafts, or other spaces. When possible, PBS has endeavored to determine the presence, and estimate the quantity and condition of suspect ACMs in these inaccessible spaces. The quantity and condition of these materials should be confirmed if they are to be abated or impacted by renovation or demolition activities.

Bulk samples were taken of all accessible suspect friable and non-friable materials, with the exception of roofing materials. Bulk samples should be taken of the roofing materials and analyzed prior to any activity that will impact these materials.

Findings

Friable felt duct tape located on ducts in the basement of the building contains asbestos. This material was observed to be in good condition and is of low concern unless damaged.

Friable cement located on boiler units in the basement also contains asbestos. This material is hard and plaster-like and is located within the boiler's metal exterior shell. Unless damaged by maintenance or other activities this material is of low concern.

76 Point-counting analysis of window putty was performed to more accurately determine the material's classification. This gray pliable putty was found to contain one percent asbestos and is therefore not considered a regulated material. However the Owner's management policies suggest that further testing is advisable prior to impact.

See Survey Floor Plans (tab two, section two) for material locations.

Materials which tested positive for asbestos:

Felt Duct Tape
Boiler Cement

Materials which tested negative for asbestos:

Gypsum Wallboard Assemblies

Plaster (Type 1 - Walls)

Plaster (Types 2 and 3 - Flue Cement)

Light Green Sheet Floor Covering

Window Putty (PLM point-count analysis: 1% asbestos)

FERRIS INDEX

Tab One, Section Two

Ferris Index Formula:

$$\text{Ferris Index} = (A + C + F + L) \times P$$

A = Accessibility

C = Condition

F = Friability

L = Location

P = Percentage

ACCESSIBILITY is the ease with which asbestos fibers can become airborne as a consequence of the architectural design, the location of the asbestos, or the activities which are occurring in the building. It is rated as follows:

	score:	
TOTALLY ENCL.	1	Enclosed (i.e. behind a suspended ceiling)
INACCESSIBLE	2	Beyond the reach of the population using the building
LOW	3	Accessible in low activity areas only
HIGH	4	Accessible in high activity areas such as gyms, cafeterias, hallways, and stairways

CONDITION rates the asbestos according to the degree of visual degradation:

	score:	
GOOD	1	No damage at all, the condition is very good
MILD	2	Mild damage
MODERATE	3	Moderate damage
SEVERE	4	Evidence of severe damage with areas missing, or showing signs of delamination and water damage, etc.

FRIABILITY refers to the extent to which the material can be broken apart when a person or object makes contact with it:

	score:	
NONE	1	Non-Friable or firmly bound
SLIGHTLY	2	Slightly friable
MODERATELY	3	Moderately friable
HIGH	4	Very friable, breaks apart with very little pressure

LOCATION is regarding presence in an air plenum:

	score:	
NO	1	Material not located in air plenum
YES	2	Material located in air plenum

PERCENTAGE of asbestos contained in the material is rated as follows:

Score:	1	One to ten percent
	2	Eleven to twenty-five percent
	3	Twenty-six to fifty percent
	4	Fifty-one percent or more

Recommended actions are based upon score as follows:

Score:	1 to 4	No Action
	5 to 9	Review in 2 to 3 years
	10 to 15	Review in one year
	16 to 20	Either surveillance or control
	>=21	Control



Material/Location	Quantity	Ferris Index Score
Duct Felt Tape Basment HVAC Ducts	+/- 185 LF	28
Insulating Cement Boiler Units	+/- 60 SF	7

Material/Location

Ferris Index Scores

Totals

Duct Felt Tape
 Basment HVAC Ducts

Accessibility:	LOW	3
Condition:	GOOD	1
Friability:	SLIGHTLY	2
Plenum:	NO	1
	Sub-total:	7
% Asbestos	>=51% x	4
	Total:	28

Insulating Cement
 Boiler Units

Accessibility:	LOW	3
Condition:	GOOD	1
Friability:	SLIGHTLY	2
Plenum:	NO	1
	Sub-total:	7
% Asbestos	1-10% x	1
	Total:	7

ASSESSMENTS/RECOMMENDATIONS

Tab One, Section Three

The ranking, relative to all the asbestos-containing materials within the building.

The material under consideration; a description follows.

The rooms or areas in which the material is observed and assessed.

A numerical identifier distinguishing between similar materials.

The 9 digit code is a PBS number; the () contains a (+) if it tested positive for asbestos; (-) if no asbestos was detected; (NT) for archived and not tested. (-/+) lists results for layered samples with multiple results. Numbers of previous samples taken by the owner may also appear. See the Bulk Sample Inventory for more details.

CLIENT ASSESSMENT/RECOMMENDATIONS

PRIORITY: #1

MATERIAL: Mag Block Insulation (1)

Location: Boiler Rm, Rooms 215 and 6B50

Quantity: (+/-) 3285 SF

Description: Manufactured white, fluffy magnesia block insulation. Blocks were typically held in place by wires and an outer layer of lagging.

Samples Taken: 3

Sample Results: POSITIVE (Negative) (Mixed) (Assumed Positive)

Sample Codes: 2262.13-105 (+); 108 (NT); 134 (-/+)

Assessment: **HIGH TO MODERATE CONCERN**

Current Damage: (Significant) MODERATE (None)

Undamaged Area: (Poor) FAIR (Good)

Friability: (High) MODERATE (None)

Accessibility: (High) MODERATE (Low)

Damage Potential: (High) MODERATE (Low)

Damage Type: FLAKING (Blistering) (Water) IMPACT

Damage Cause: AGE VIBRATION (Water) (Vandals) MAINTENANCE

Air Plenum: (Yes) NO

Discussion:
It appears that improper maintenance has resulted in damage. The outer layer of lagging reduces the friability classification. If the lagging becomes damaged, the exposed material is highly friable. Repair of material should include initial cleaning of affected horizontal surfaces such as floor and tops of intact pipe insulation using we methods and/or HEPA vacuuming. Area cleaned should be at least the room(s) containing the friable material.

RESPONSE ACTIONS:

Preventative Measures Prior to Abatement:
Do not disturb material without proper training and protection. Repair material. Establish an Operations and Maintenance Program.

Recommended Abatement Action:
Remove material under full isolation procedures. Other materials are present in the abatement area and could be removed under the same contract.

Other Options:
Labelled material should deter damage making encapsulation less necessary.

Lab analysis results of the samples taken of this material. The Assumed Positive selection is used when the experience of the inspector can judge it to be an asbestos-containing material.

A PBS exclusive assessment which groups the material into one of four (4) categories: Immediate Health, High, Medium and Low Concerns.

The factors influencing the assessment classifications. The capitalized items are the ones selected from the possible choices indicated here. When more than one choice is selected, this is a combined value. Only the selected classifications appear on the assessment page.

Additional comments or discussion by the field inspector and project manager.

The least burdensome minimum recommendation. These actions should be initiated as soon as possible. Although not typical, in some cases this will be complete removal.

The planned response action recommended; see discussion of options under Tab 2.

Other response actions that may be prudently considered by the Owner.

PRIORITY: #1

MATERIAL: Duct Felt Tape

Location: Basment HVAC Ducts
Quantity: +/- 185 LF
Description: A paper product manufactured using a pressed felting process. It is usually 1" - 3" wide and used to seal metal seams on mechanical ductwork.

Samples Taken: 2
Sample Results: Positive
Sample Code(s): 7045.21 -009, -010

Assessment: **LOW CONCERN**

Accessibility:	LOW	Undamaged Area:	GOOD
Current Damage:	NONE	Damage Potential:	LOW
Friability:	MODERATE	Damage Type:	N/A
Air Plenum:	NO	Damage Cause:	N/A

Discussion: Felt tape located at seams of HVAC ductwork in basement contains asbestos. Extent of material is difficult to verify as it may exist in wall and ceiling cavities. +/- 185 LF of material is located in the basement.

RESPONSE ACTIONS:

Preventative Measures Prior to Abatement:

Do not disturb material without proper training and protection. Label material and continue to implement Operations and Maintenance Program.

Recommended Abatement Action:

Remove material under full isolation procedures.

Other Options:

Maintain material in good condition and encapsulate accessible material as necessary.

PRIORITY: #2

MATERIAL: Insulating Cement

Location: Boiler Units
Quantity: +/- 60 SF
Description: Cementitious mixture applied to or adjacent to tanks, boilers, etc. for insulating value or to seal openings. The insulating cement is sometimes protected with lagging, but is often exposed.

Samples Taken: 1
Sample Results: Positive
Sample Code(s): 7045.21 -011

Assessment: **LOW CONCERN**

Accessibility:	LOW	Undamaged Area:	GOOD
Current Damage:	NONE	Damage Potential:	LOW
Friability:	MODERATE	Damage Type:	N/A
Air Plenum:	NO	Damage Cause:	N/A

Discussion: +/- 60 SF of insulating cement located on boiler units contains asbestos. Material is not protected by lagging and is enclosed behind the sheet metal exterior.

RESPONSE ACTIONS:

Preventative Measures Prior to Abatement:

Do not disturb material without proper training and protection. Label material and continue to implement Operations and Maintenance Program.

Recommended Abatement Action:

Remove material under full isolation procedures.

Other Options:

Maintain material in good condition and encapsulate material as necessary.

COST ESTIMATES

Tab One, Section Four

Abatement Area	Item	Approx. Quantity	Unit	Unit Price	Abatement Cost Estimate
Throughout Building	Duct Felt Tape	185	L.F.	\$4.00	\$740.00
	Insulating Cement	60	S.F.	\$5.50	\$330.00
	Mobilization		L.S.		\$750.00
Area Total:					\$1,820.00
Building Total:					\$1,820.00

Notes:

- 1) See Floor Plans, Tab 2, Section 2, for material locations.
- 2) L.F. = Linear Feet; S.F. = Square Feet; L.S. = Lump Sum; EA. = Each.

Cost Estimate Assumptions:

- 1) Unit price cost estimates are based on 1995 Means Construction Data information, PBS historical data and information provided by local contractors.
- 2) Project design, specification developments, management, air monitoring costs, and demolition costs are not included.
- 3) Unit prices are for removal and disposal only.

BULK ASBESTOS SAMPLE INVENTORY

Tab Two, Section One

CODE	MATERIAL / LOCATION	ANALYSIS / LAB
7045.21-001	Wall Plaster (1) Basement - Southwest	NAD PBS
7045.21-002	Wall Plaster (1) Basement - East door frame	NAD PBS
7045.21-003	Wall Plaster Basement - stairwell	NAD PBS
7045.21-004	Sheet Floor Covering First floor West hallway	NAD PBS
7045.21-005	Gypsum Wallboard Basement North	NAD (All layers) PBS
7045.21-006	Gypsum Wallboard Basement North	NAD (All layers) PBS
7045.21-007	Plaster (2) Gray Flue Cement - North side	NAD PBS
7045.21-008	Plaster (3) White Flue cement - South side	NAD PBS
7045.21-009	Duct Felt Tape Basement North unit	55% Chrysotile (Paperlike, green/gray) PBS
7045.21-010	Duct Felt Tape Basement Northeast duct	60% Chrysotile (Paperlike, green/gray) PBS

***NAD** = No Asbestos Detected

*Samples will be disposed of after 330/95 unless Owner notifies PBS.

CODE	MATERIAL / LOCATION	ANALYSIS / LAB
7045.21-011	Insulating Cement Boiler cement/cork - North unit	NAD (Dark gray, cement-like) 5% Chrysotile (Dark gray, friable) PBS
7045.21-012	Window Putty Basement North	1% Chrysotile (Compound, tan-cream) PBS
7045.21-013	Window Putty Basement North	<1% Chrysotile (Beige putty material) R.J. Lee Group


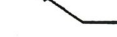


***NAD** = No Asbestos Detected

*Samples will be disposed of after 330/95 unless Owner notifies PBS.

SURVEY FLOOR PLANS

Tab Two, Section Two

LEGEND

-  DRAWING REFERENCE TO BULK SAMPLE FIELD CODE, SEE INVENTORY OF SAMPLES
-  MATERIAL SYMBOL
-  ASBESTOS-CONTAINING SHEET FLOOR COVERING
-  CIRCLED NUMBERS INDICATE THE APPROX. NUMBER AND LOCATION OF ASBESTOS-CONTAINING HARD FITTINGS ON FIBERGLASS INSULATED PIPE.

ASBESTOS SAMPLE SYMBOLS

NOT TESTED	NEGATIVE	POSITIVE	
	-	+	
○	⊖	●	MECHANICAL INSULATION
□	⊞	■	SURFACING MATERIAL
◇	⊠	◆	MISCELLANEOUS MATERIAL

NOTES

- THIS DRAWING IS DIAGRAMMATIC. IT IS FOR GENERAL INFORMATION AND SAMPLE LOCATION.
- ACCESSIBLE SPACES WERE SURVEYED FOR SUSPECT ASBESTOS MATERIALS. SUSPECT MATERIALS FOUND TO BE ASBESTOS-CONTAINING ARE NOTED ON THE DRAWING.
- FOR DETAILED SAMPLE INFORMATION SEE LABORATORY REPORTS, TAB TWO, SECTION FOUR.
- FOR MATERIAL IDENTIFICATION SEE PHOTO DOCUMENTATION, TAB TWO, SECTION THREE.
- +/- 185 LF ASBESTOS-CONTAINING DUCT FELT TAPE EXISTS ON HYAC DUCTS IN BASEMENT.

INVENTORY OF ASBESTOS SAMPLES - BASEMENT

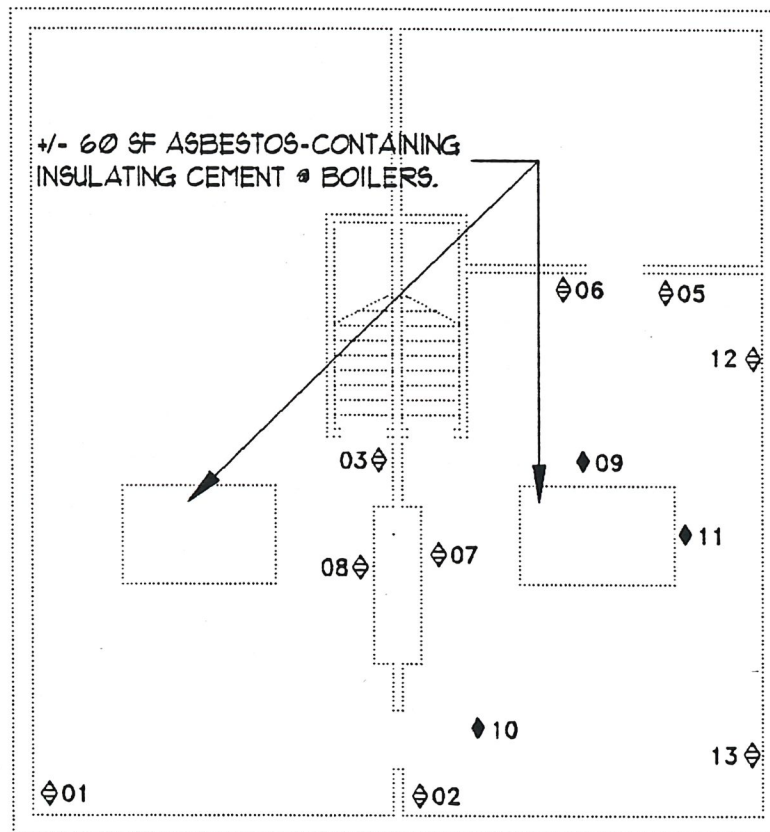
DRAWING REFERENCE	FIELD CODE	LAB RESULT	MATERIAL SAMPLED
◇01	7045.21-001	(-)	WALL PLASTER (1)
◇02	7045.21-002	(-)	WALL PLASTER (1)
◇03	7045.21-003	(-)	WALL PLASTER (1)
◇05	7045.21-005	(-)	GYPSTUM WALLBOARD
◇06	7045.21-006	(-)	GYPSTUM WALLBOARD
◇07	7045.21-007	(-)	PLASTER (2) - FLUE CEMENT
◇08	7045.21-008	(-)	PLASTER (3) - FLUE CEMENT
◆09	7045.21-009	(+)	DUCT FELT TAPE
◆10	7045.21-010	(+)	DUCT FELT TAPE
◆11	7045.21-011	(-)/(+)	CORK/BOILER CEMENT
◇12	7045.21-012	(-)	WINDOW PUTTY (POINT COUNT ANALYSIS)
◇13	7045.21-013	(-)	WINDOW PUTTY

INVENTORY OF ASBESTOS SAMPLES - FIRST FLOOR

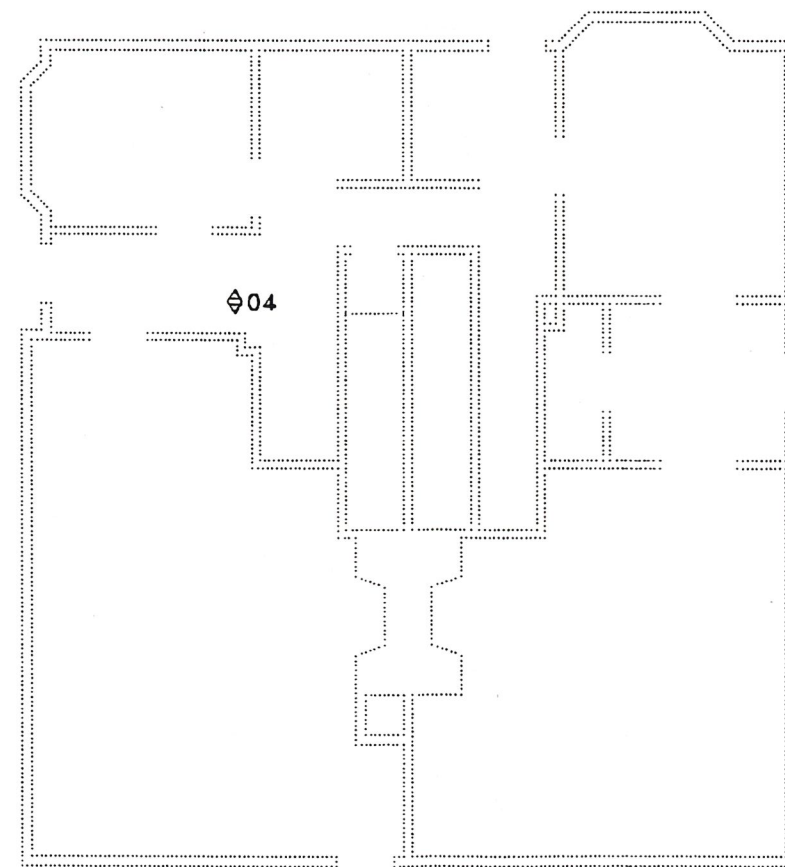
◇04	7045.21-004	(-)	SHEET FLOOR COVERING
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INVENTORY OF ASBESTOS SAMPLES - SECOND FLOOR

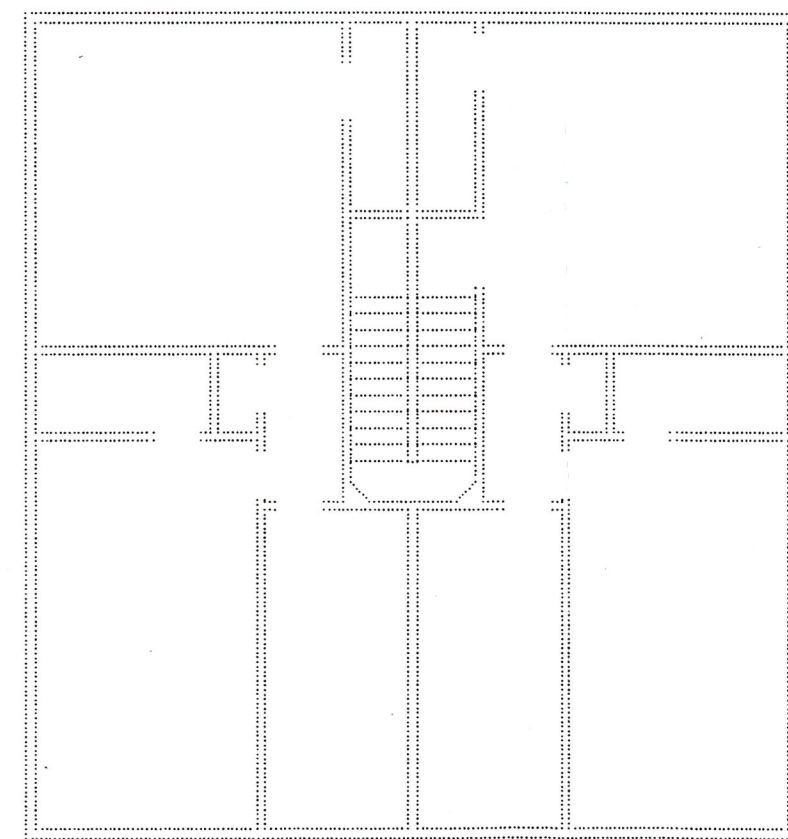
THERE WERE NO SAMPLES TAKEN ON THIS FLOOR.



BASEMENT PLAN
SCALE: APPROXIMATELY 1"=10'



FIRST FLOOR PLAN
SCALE: APPROXIMATELY 1"=10'



SECOND FLOOR PLAN
SCALE: APPROXIMATELY 1"=10'



7045.21

704521-1



220 S. FINLAY
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ASBESTOS SURVEY PLAN
A.P.
STATE OF WASHINGTON
GENERAL ADMINISTRATION

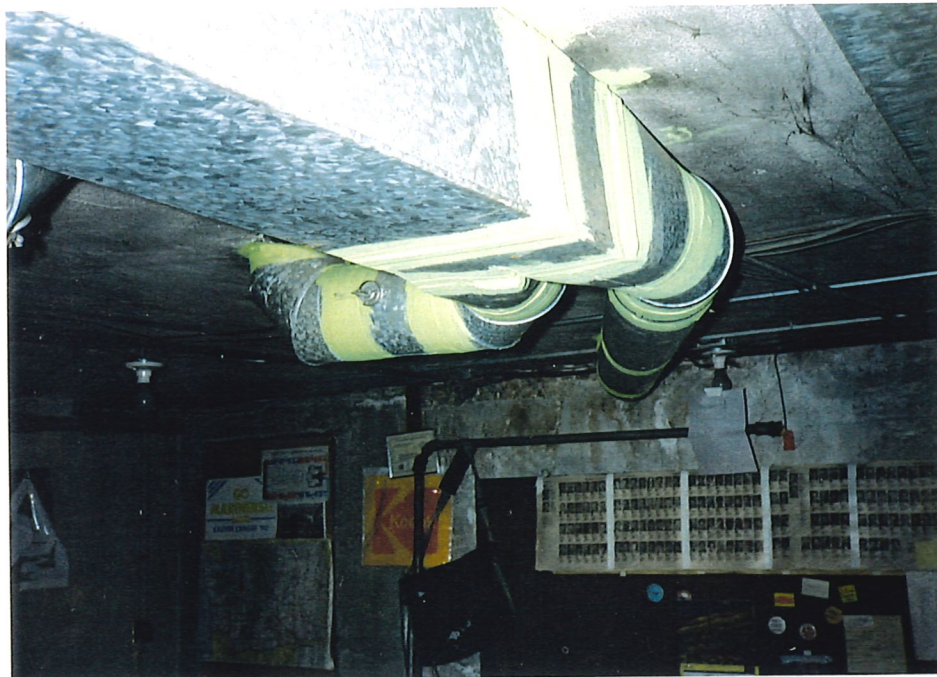
MAR 1995

1 OF 1

SECTION TWO
2.1

PHOTO DOCUMENTATION

Tab Two, Section Three



A. ASBESTOS-CONTAINING DUCT FELT TAPE;
BASEMENT AREA.



B. ASBESTOS-CONTAINING CEMENT MATERIAL;
BASEMENT FURNACE UNIT.

LABORATORY REPORTS/ CHAINS-OF-CUSTODY

Tab Two, Section Four

- Refer to Bulk Sample Inventory (Tab Two, Section One) for summary of results.
- Laboratory descriptions of materials may differ from those of the inspector. See Photo Documentation (Tab Two, Section Three) for visual identification of asbestos-containing materials.

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1220 S.W. MORRISON STREET
PORTLAND, OREGON 97205
(503) 248-1939

BULK SAMPLE ASBESTOS ANALYSIS

Client: Washington Department of General Ser Report Date: 2/03/95
1058 Capitol Way Date Received: 2/03/95
Olympia, WA 98504 Client Project ID: N/A
PBS Project No.: 7045.21
Page No.: 1 of 6

Client Sample ID : 7045.21-001
PBS Lab ID: 95-00-437

Percent of Sample: 100%

Asbestiform Mineral Fibers

Total % Asbestos Fibers: NAD

Other Fibers

Cellulose 2%

NO ASBESTOS DETECTED

COMMENTS: Plaster, White/gray.

Client Sample ID : 7045.21-002
PBS Lab ID: 95-00-438

Percent of Sample: 100%

Asbestiform Mineral Fibers

Total % Asbestos Fibers: NAD

Other Fibers

Cellulose 2%

NO ASBESTOS DETECTED

COMMENTS: Plaster, White/gray.

BULK SAMPLE ASBESTOS ANALYSIS

Client: Washington Department of General Ser Report Date: 2/03/95
1058 Capitol Way Date Received: 2/03/95
Olympia, WA 98504 Client Project ID: N/A
PBS Project No.: 7045.21
Page No.: 2 of 6

Client Sample ID : 7045.21-003
PBS Lab ID: 95-00-439

Percent of Sample: 100%

Asbestiform Mineral Fibers

Total % Asbestos Fibers: NAD

Other Fibers

Cellulose 1%

NO ASBESTOS DETECTED

COMMENTS: Plaster, White/gray.

Client Sample ID : 7045.21-004
PBS Lab ID: 95-00-440

Percent of Sample: 100%

Asbestiform Mineral Fibers

Total % Asbestos Fibers: NAD

Other Fibers

Cellulose 20%

NO ASBESTOS DETECTED

COMMENTS: Sheet vinyl, Green-gray/tan.

BULK SAMPLE ASBESTOS ANALYSIS

Client: Washington Department of General Ser Report Date: 2/03/95
1058 Capitol Way Date Received: 2/03/95
Olympia, WA 98504 Client Project ID: N/A
PBS Project No.: 7045.21
Page No.: 3 of 6

Client Sample ID : 7045.21-005
PBS Lab ID: 95-00-441

	<u>LAYER 1</u>	<u>LAYER 2</u>	<u>LAYER 3</u>
Percent of Sample:	50%	35%	15%

Asbestiform Mineral Fibers

Total % Asbestos Fibers:	NAD	NAD	NAD
--------------------------	-----	-----	-----

Other Fibers

Fibrous Glass	-	-	3%
Cellulose	1%	99%	4%

NO ASBESTOS DETECTED

COMMENTS: Layer 1: White compound, Layer 2: Gray paper,
Layer 3: White gypsum. Ashed layer 1.

Client Sample ID : 7045.21-006
PBS Lab ID: 95-00-442

	<u>LAYER 1</u>	<u>LAYER 2</u>	<u>LAYER 3</u>
Percent of Sample:	15%	25%	60%

Asbestiform Mineral Fibers

Total % Asbestos Fibers:	NAD	NAD	NAD
--------------------------	-----	-----	-----

Other Fibers

Fibrous Glass	-	-	4%
Cellulose	1%	98%	3%

NO ASBESTOS DETECTED

COMMENTS: Layer 1: White compound, Layer 2: Gray paper,
Layer 3: White gypsum.

BULK SAMPLE ASBESTOS ANALYSIS

Client: Washington Department of General Ser Report Date: 2/03/95
1058 Capitol Way Date Received: 2/03/95
Olympia, WA 98504 Client Project ID: N/A
PBS Project No.: 7045.21
Page No.: 4 of 6

Client Sample ID : 7045.21-007
PBS Lab ID: 95-00-443

Percent of Sample: 100%

Asbestiform Mineral Fibers

Total % Asbestos Fibers: NAD

Other Fibers

Wollastonite 35%

NO ASBESTOS DETECTED

COMMENTS: Cementlike, Dk.gray. Sample ashed.

Client Sample ID : 7045.21-008
PBS Lab ID: 95-00-444

Percent of Sample: 100%

Asbestiform Mineral Fibers

Total % Asbestos Fibers: NAD

Other Fibers

Wollastonite 38%

NO ASBESTOS DETECTED

COMMENTS: Cementlike, Dk.gray/white.

BULK SAMPLE ASBESTOS ANALYSIS

Client: Washington Department of General Ser Report Date: 2/03/95
1058 Capitol Way Date Received: 2/03/95
Olympia, WA 98504 Client Project ID: N/A
PBS Project No.: 7045.21
Page No.: 5 of 6

Client Sample ID : 7045.21-009
PBS Lab ID: 95-00-445

Percent of Sample: 100%

Asbestiform Mineral Fibers

Chrysotile 55%

Total % Asbestos Fibers: 55%

Other Fibers

Cellulose 4%

TOTAL % ASBESTOS: 55%

COMMENTS: Paperlike, Green/gray.

Client Sample ID : 7045.21-010
PBS Lab ID: 95-00-446

Percent of Sample: 100%

Asbestiform Mineral Fibers

Chrysotile 60%

Total % Asbestos Fibers: 60%

Other Fibers

Cellulose 2%

TOTAL % ASBESTOS: 60%

COMMENTS: Paperlike, Green/gray.

BULK SAMPLE ASBESTOS ANALYSIS

Client: Washington Department of General Ser Report Date: 2/03/95
1058 Capitol Way Date Received: 2/03/95
Olympia, WA 98504 Client Project ID: N/A
PBS Project No.: 7045.21
Page No.: 6 of 6

Client Sample ID : 7045.21-011
PBS Lab ID: 95-00-447

	<u>LAYER 1</u>	<u>LAYER 2</u>
Percent of Sample:	70%	30%
<u>Asbestiform Mineral Fibers</u>		
Chrysotile	-	5%
Total % Asbestos Fibers:	NAD	5%
<u>Other Fibers</u>		
Cellulose	-	1%
Mineral wool	-	50%
Wollastonite	35%	-

COMBINED TOTAL % ASBESTOS: 2%

COMMENTS: Layer 1: Dk.gray cementlike, Layer 2: Dk.gray friable.

Client Sample ID : 7045.21-012
PBS Lab ID: 95-00-448

Percent of Sample:	100%
<u>Asbestiform Mineral Fibers</u>	
Chrysotile	1%
Total % Asbestos Fibers:	1%
<u>Other Fibers</u>	
Cellulose	1%

TOTAL % ASBESTOS: 1%

COMMENTS: Compound, Tan-cream.

Reviewed by: Rollie A. Champe Analyst(s): Man Ninh
Approved Signatory

PBS ENVIRONMENTAL

1220 S.W. MORRISON STREET

PORTLAND, OREGON 97205

(503) 248-1939

BULK SAMPLE ASBESTOS ANALYSIS

Client: Washington Department of General Ser Report Date: 4/10/95
1058 Capitol Way Date Received: 4/10/95
Olympia, WA 98504 Client Project ID: N/A
PBS Project No.: 7045.21
Page No.: 1 of 1

Client Sample ID : 7045.21-012

PBS Lab ID: 95-01-357

Percent of Sample: 100%

Asbestiform Mineral Fibers

Chrysotile 1%

Total % Asbestos Fibers: 1%

TOTAL % ASBESTOS: See point-count result below

COMMENTS: Compound, beige-cream. Point-count result: 4 fibers/400 points counted; 1% ASBESTOS per 40CFR, Part 763, Subpt. F, Appx. A.

Reviewed by:

Rollie A. Champe
Approved Signatory

Analyst(s): Rollie A. Champe

Table I

Polarized Light Analysis Results Project

Sample Number / Sample Appearance	Client	Sample Number	Asbestos-----Nonasbestos-----														
			Chrysotile	Amosite	Crocidolite	Anthophyllite	Tremolite	Actinolite	Cellulose	Wool	Glass	Fibers	Fibers	Other	NonFibrous	Run Date	
1524566CPL Beige putty material	7045.21-013	<1 Tr %	-	-	-	-	-	-	-	-	-	-	-	-	100 %	1/31/95	KZ
NFM: Qtz, Carb, Binder, Opaq, Gyp, Mag, Fine Grains, Misc. Part. Homogeneous																	

[Handwritten Signature]
Authorized Signature _____
Date Friday, February 3, 1995

2424 Sixth Street
Berkeley, CA 94710
Page: 1 of 1

RJ Lee Group, Inc.
Berkeley

Phone (510) 486-8319
Fax (510) 486-0927

**P B S
ENVIRONMENTAL**

**TRANSMITTAL AND CHAIN OF CUSTODY
FOR
BULK SAMPLES**

Project No. 7045.21

Individuals signing this form warrant that the information that is applicable to their title is correct and complete. The Sender should keep a copy and send the original. The Receiver should complete the form, keep a copy and return the original to the Sender. Receiver shall report damage of package immediately to Sender.

SENDER

Date Sent: January 27, 1995
 PBS Environmental
 Attn:
 220 South Findlay Street
 Seattle, WA 98108
 (206) 233-9639

Deborah Minassian
 Taylored Business Services
 Deborah Minassian 1/27/95
 Authorized Signature Date

RECEIVER

DATE RECEIVED 30 JAN 1995
 COMPANY PBS Laboratory
 ADDRESS 1220 S.W. Morrison #600
 Portland, OR 97205

Condition of Package: OK

RELLIE CHAMPE
 Name Rellie A. Champe 30 JAN 1995
 Authorized Signature Date

Sender's ID No.	Brief Description (May be left blank when sending bulk samples)	Receiver's ID No.
7045.21-001	_____	95-CC-437
7045.21-002	_____	-438
7045.21-003	_____	-439
7045.21-004	_____	-440
7045.21-005	_____	-441
7045.21-006	_____	-442
7045.21-007	_____	-443
7045.21-008	_____	-444
7045.21-009	_____	-445
7045.21-010	_____	-446
7045.21-011	_____	-447
7045.21-012	_____	-448

Please analyze the enclosed 12 samples for asbestos content using PLM with dispersion staining. PBS requests prior notification if samples will be disposed. Request fax results by: _____ AM/PM _____ Date

P B S
ENVIRONMENTAL

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DATE RECEIVED 30 JAN 1995
COMPANY PBS Laboratory
ADDRESS 1220 S.W. Morrison #600
Portland, OR 97205

Condition of Package: OK

RELLIE CHAMPE
Name Rellie A. Champe 30 JAN 1995
Authorized Signature Date

Sender's ID No.	Brief Description (May be left blank when sending bulk samples)	Receiver's ID No.
7045.21-001		95-CO-437
7045.21-002		-438
7045.21-003		-439
7045.21-004		-440
7045.21-005		-441
7045.21-006		-442
7045.21-007		-443
7045.21-008		-444
7045.21-009		-445
7045.21-010		-446
7045.21-011		-447
* 7045.21-012	* POINT-COUNT	-448

POINT-COUNT LAB NO.
95-01-35

Please analyze the enclosed 12 samples for asbestos content using PLM with dispersion staining. PBS requests prior notification if samples will be disposed. Request fax results by: _____ AM/PM _____ Date

* POINT-COUNT REQUESTED 4/10/95 PER TIM OGDEN, PBS
RL

SURVEY PROCESS

Tab Three, Section One

SCOPE

PBS Environmental provided a field investigation and survey report according to contract documents. Qualitative observations were made of representative areas of the building in an effort to gain an understanding of existing conditions. Unless otherwise specified in the survey scope in Section One, Page 1.0, only exposed or accessible materials were surveyed. The inspector must be able to clearly view and access suspect ACMs in order to sample the material and perform a physical assessment.

Exposed and accessible suspect ACMs, including those in ceiling plenums, crawl spaces, mechanical room, plumbing chases, attics and other similar areas, were sampled, analyzed and assessed. Inaccessible materials include those contained within wall and hard ceiling cavities, enclosed in metal jacketing, and located in spaces not accessible by access panels or doors, etc.

Inaccessible Thermal System Insulation (TSI) may exist in ceiling or wall cavities, elevator shafts, or other spaces that could not be accessed by ladders, access panels, doors etc. These materials could not be sampled or assessed.

Inaccessible suspect materials such as sheet floor covering, floor tile/mastic, and levelling compound may exist under carpeting and in other spaces. Where possible, carpeting was lifted to survey for suspect materials, and suspect materials found were sampled, analyzed, and assessed. If found to contain asbestos, these materials are indicated on the survey plan drawings.

When possible, PBS has endeavored to make accurate assumptions regarding the presence, quantity and condition of suspect ACMs in inaccessible spaces based upon review of plans, construction documents, and other sources of information. If materials are assumed to contain asbestos, they are assessed, noted on the survey plan drawings, and are incorporated into the Cost Estimates and Ferris Index sections of the report. The quantity and condition of these materials should be confirmed if they are to be abated or impacted by renovation, demolition, or other building activities.

Due to the difficulty in classifying fire-rated doors via representative sampling, the Owner has requested that all such doors be assumed to contain asbestos. Fire doors are included in the Ferris Index, Assessments, Cost Estimates and are noted on the survey plan drawings. These doors should be tested prior to any impact.

The assessments discussed in the body of this report are based upon the potential for future damage, disturbance, air erosion factors, friability, proximity to air plenums, and present condition of asbestos-containing building materials as outlined and recommended by the Environmental Protection Agency (EPA). This survey has established four basic assessment categories: Immediate Health Concern, High Concern, Moderate Concern, and Low Concern. (See the definitions portions of this section.)

SAMPLING STRATEGY

PBS inspectors are accredited under the EPA's Asbestos Hazard Emergency Response Act (AHERA, 40 CFR Part 763, October 1987) training programs for Building Inspection for Asbestos and Management Planning for Asbestos Control. PBS collected bulk samples of suspect asbestos-containing materials (ACMs) according to protocols outlined in AHERA.

Suspect asbestos-containing building materials were documented in accessible locations of the subject building and were generally sampled in accordance with the contractual agreement. Homogeneous (similar) areas of each material were determined to develop a bulk sampling strategy. The PBS field inspectors used the following guide to determine the sampling strategy.

FIELD-MIXED MATERIALS

A field-mixed material is any suspect material whose ingredients were mixed on-site during construction. Examples are gypsum wallboard joint compound, sprayed-on fireproofing, sprayed-on acoustical or decorative treatment, hard-fittings, plaster, and insulating cements on ductwork. The ingredients and quantity of each of these materials can vary due to uncontrolled quality measures and human factors.

MANUFACTURED MATERIALS

Manufactured materials were produced under controlled conditions in a factory and were packaged, sent to the project site, and then installed. It was assumed that quality control of the manufacturing process reasonably assured consistent quantities of each ingredient. Examples of manufactured materials are glued-on or lay-in ceiling tiles, vinyl floor tiles, and sheet vinyl.

VISUALLY OBSCURED MANUFACTURED MATERIALS

Materials that are manufactured and installed but are then covered are considered obscured. Examples are block insulation on a boiler, and asbestos-containing pipe insulation. These materials were generally covered with a separate lagging compound which was often painted. Even though much care is taken in the field to verify the continuity of the hidden material, it may not be possible to assure absolute consistency.

DIVERGENT SAMPLE

When all of the sample sites are randomly spread out over a homogeneous area, a sample sent to a competitive lab is called a divergent sample. The divergent sample is NOT taken directly adjacent to another sample, but is taken at a separate sample site. The other samples are sent to the main lab.

REDUNDANT SAMPLE

A redundant sample involves taking two side by side samples at the same sample site. One sample is sent to a competitive lab and the other is sent to the main lab. Results are compared for consistency. Redundant samples assure that the same material is being analyzed by each lab.

A material suspected by the PBS field inspector to contain asbestos can be assumed to contain asbestos (positive) without supporting sample data. As well, the material can be sampled to determine its asbestos content. A material is considered positive if one sample shows greater than one percent asbestos by Polarized Light Microscopy (PLM). Note that all samples must show one percent or less asbestos, not just a majority, for a material to be considered non-asbestos (negative). At the request of the Owner, materials that contain one percent asbestos have been considered asbestos-containing materials.

The AHERA Rule outlines sampling protocols for asbestos inspections. A specific number of samples must be taken of surfacing materials and TSI in order to determine a negative. The required number of surfacing material samples is based upon the square footage of material present. AHERA states that the inspector collect samples of cementitious thermal system fitting insulation and miscellaneous materials in a manner sufficient to determine whether the material contains asbestos.

PBS has endeavored to incorporate data from previous bulk sampling performed by the Owner when feasible. Sample locations were documented in the field and referenced in reports on file with the Owner's Asbestos Management Unit. Only those samples verified in the field are noted on the survey plan drawings and in the Assessments section.

LABORATORY ANALYSIS

The bulk samples were transported to laboratories accredited by the National Institute of Standards and Technology's (NIST) National Voluntary Laboratory Accreditation Program (NVLAP) mandated by the EPA in the AHERA regulations. These laboratories' quality control procedures are in full compliance with NVLAP standards, and lab certification is provided in the Appendix.

Single use disposable containers were used in sample collection to prevent cross-contamination. Chain of Custody Transmittal forms (included) were used to document handling procedures.

The samples were analyzed by PLM according to the EPA's Test Method: Method for Determination of Asbestos in Bulk Building Materials (US. EPA 600/R-93/116, July 1993). This method has a reliable limit of detection of one percent asbestos.

PBS has endeavored to perform quality control analysis of approximately 10% of the total number of samples taken from an individual building. These samples are separated from the majority of samples and analyzed by an alternate laboratory satisfying all requirements of the contract documents and AHERA protocols. Samples submitted in this manner are taken as described above in the Sampling Strategy section.

Once a material tests positive, the need for further analysis is eliminated. Generally only one sample of a highly suspect material is analyzed, as a positive result is likely. All samples of low suspect materials, such as lay-in ceiling tiles, are typically sent for analysis, as negative results are expected. The remaining samples not sent to the laboratory are archived through March 1995 at PBS Environmental and can be sent to the building owner upon request.

ASBESTOS SURVEY DEFINITIONS

ACBM

Asbestos-Containing Building Material is any material that contains more than one percent asbestos as determined by analysis in accordance with the EPA Method 600/R-93/116, July 1993, for Polarized Light Microscopy.

AIR CELL PIPE INSULATION

Trade name for manufactured corrugated cardboard-like asbestos pipe insulation. Two cylindrical halves were typically fitted around a pipe and held in place through an outer layer of lagging compound.

ACCESSIBILITY

With reference to material assessments, subject to disturbance by building occupants, custodial or maintenance personnel in the course of their normal activity.

ACCESSIBLE AREAS

With reference to surveys, areas of a building that can be physically or visually accessed without damaging building components. These areas generally include interstitial ceiling spaces, pipe chases with access doors, pipe tunnels with access hatches and similar spaces. Materials which are buried, enclosed behind walls or plaster ceilings, under metal jackets, etc., are not accessible.

AIR CELL JACKET

Trade name for manufactured corrugated heavy paper product applied in sheets to insulate boilers, tanks, ductwork, etc. On boilers and tanks, jacket was typically held in place with lagging compound and metal straps.

ASHED

Refers to the state of a bulk asbestos sample once it has been prepared for analysis by incineration in a furnace.

ASSESSMENT CRITERIA

Materials are assessed in this report with consideration given to the following criteria:

CURRENT DAMAGE

Documents the extent and condition of a material's damage.

UNDAMAGED AREA

Documents the condition of the material exclusive of the damaged areas. Considers only the portion of the material not damaged.

ASSESSMENT CRITERIA (continued)

FRIABILITY (See FRIABLE below)

Documents the material's ability, when dry, to crumble, crush, pulverize, or be reduced to powder by hand pressure.

ACCESSIBILITY

Documents the material's proximity to building occupants either directly or via air currents.

CEMENT ASBESTOS BOARD

A manufactured rigid cementitious board with asbestos fibers bound into the material's matrix.

DAMAGE

A material that has deteriorated or sustained physical injury such that the internal structure (cohesion) is inadequate, or has delaminated such that its bond to the substrate (adhesion) has loosened. Signs of damage include flaking, blistering, crumbling, water stains, gouges, scrapes, mars, and/or the presence of ACM debris.

DAMAGE POTENTIAL

Documents the likelihood and severity that the material will be further damaged or will become damaged.

DUCT INSULATING CEMENT

Cementitious compound typically at the corner edges inside of a fiberglass insulated duct. The cement is typically protected by a cloth covering contiguous with the adjacent fiberglass.

FELT WRAP PIPE INSULATION

Layers of heavy felt used as pipe insulation. Felts are typically thicker than paper layers. Two cylindrical halves were generally fitted around a pipe and held in place with a layer of lagging cloth.

FRIABLE

A material that can be crumbled, crushed, pulverized or reduced to powder by hand pressure. Friable asbestos materials typically have a greater potential to release fibers. Friability is determined by the inspector physically touching the suspect materials.

GLUED-ON TILES

Tiles, usually one foot by one foot, attached directly to the building structure using various types of adhesives or fasteners.

HARD FITTINGS ON FIBERGLASS

An insulating cement packed around pipe fittings such as elbows, valves, tees, etc. The cement, which ranges in consistency from hard cement-like to soft powdery material, is typically protected by lagging cloth contiguous with the adjacent pipe insulation.

HEPA

High Efficiency Particulate Air filter capable of screening 99.97% of particles 0.3 microns or larger. HEPA filters are used in respirators, special vacuums, and other equipment.

HIGH CONCERN

A material that is friable, accessible, in poor condition and/or with a high potential for future damage. It does not represent the extreme situation of an Immediate Health Concern, but it is an assessment indicating that positive actions should be taken in a timely matter. Example: Highly friable and accessible sprayed-on fireproofing.

HOMOGENEOUS AREA

An area of surfacing material, thermal system insulation or miscellaneous material that, in its original application, is uniform in color, appearance and texture.

IMMEDIATE HEALTH CONCERN

Highly friable asbestos containing material which is in a deteriorated condition, easily accessible, and easily capable of emitting fibers into the air. Example: Damaged mag insulation creating substantial quantities of debris and located in an accessible area.

INSULATING CEMENT

Cementitious mixture applied typically to or adjacent to tanks, boilers, etc. for insulating value or to seal openings. The insulating cement is sometimes protected with lagging, but is often exposed.

LAGGING ON PIPE INSULATION

Cementitious compound and/or layer(s) of heavy felt lagging covering paper wrap, air cell, fiberglass, or other type of pipe material.

LOW CONCERN

Generally a material that is non-friable. It can also include moderately friable materials in good condition that are in remote locations. Example: Vinyl asbestos floor tiles and cement asbestos board.

MAG THERMAL INSULATION

Manufactured white, fluffy magnesia asbestos insulation. Examples typically include blocks fitted around a boiler, or two cylindrical halves fitted around a pipe, held in place by an outer layer of lagging cloth.

MASTIC

Adhesive used in a variety of applications, most commonly black, sticky material adhering floor tiles to flooring substrate. Also found on ceiling tiles and sheet flooring.

MATERIAL DEBRIS

Fragments of asbestos-containing materials that have completely separated from their original "parent" application.

MECHANICAL ISOLATION CLOTH

A heavy woven fabric located typically between air handling equipment and an adjacent air duct to prevent the transmission of vibrations/noise.

MISCELLANEOUS MATERIAL

Any material that is not TSI or surfacing material such as floor tiles, ceiling tiles, sheet floor covering, etc.

MODERATE CONCERN

Moderately friable or potentially friable materials that are in good condition or located in areas that are not easily accessible with a moderate potential for future damage. Example: Accessible air cell pipe insulation in good condition.

PAPER WRAP PIPE INSULATION

Non-corrugated heavy paper pipe insulation. Two cylindrical halves are typically fitted around a pipe and held with lagging material. Typically contains multiple layers of different paper types.

PERMALITE

Manufactured white, fluffy perlite pipe insulation, visually similar to magnesia pipe insulation. Two cylindrical halves are typically fitted around a pipe and held in place by an outer layer of lagging material.

POTENTIAL FOR DAMAGE

A material in an area regularly used by building occupants with indications that damage is likely to occur. Indications include maintenance practices, equipment movement, occupancy use patterns, accessibility to traffic, and changes in building use.

SIGNIFICANT DAMAGE

Damage that is both extensive and severe. In reference to surfacing materials or thermal system insulation, that damage would generally be at least ten percent when evenly distributed over an area, or twenty-five percent when localized.

SURFACING MATERIAL

Sprayed-on, troweled-on, or similarly applied materials installed on a surface substrate of gypsum board, steel structure, etc. Surfacing materials include fireproofing, "popcorn" ceiling textures, and spray-on acoustical materials.

SUSPENDED CEILING TILES

Acoustical tiles (generally two feet by four feet), placed in a suspended metal grid that is supported with wires attached to the above structure.

TEXTURED CEILING MATERIAL

A material sprayed on to a ceiling substrate to create a textured appearance. It is usually applied for decorative and/or acoustical purposes.

TSI

Thermal System Insulation. Materials applied to pipes, fittings, boilers, breeching, tanks, ducts or other components to prevent heat loss or gain, or water condensation.

VINYL FLOOR TILE

Manufactured floor tiles typically nine inches by nine inches or twelve inches by twelve inches, composed of a dense vinyl matrix that often contains asbestos and is adhered to the substrate with a mastic that often contains asbestos.

GENERAL MANAGEMENT OPTIONS

Tab Three, Section Two

GENERAL MANAGEMENT OPTIONS

There are four general approaches to asbestos management from which the building owner may choose. The options are: Removal, Encapsulation, Enclosure, Operations and Maintenance (O&M) Program. See the definitions in this section.

Typically one or a combination of several different options are selected. The health risks associated with asbestos are caused by inhalation of airborne asbestos fibers. Long-term exposure to asbestos fibers has been linked to asbestosis, lung cancer, and other forms of cancer. Cigarette smoking in combination with the exposure to asbestos fibers dramatically increases the likelihood of contracting an asbestos-related disease. The four general management options attempt to control or minimize airborne asbestos fibers, and can be successful if properly implemented. When used correctly and appropriately, the methods are designed to protect human health and the environment.

In choosing among these abatement options, the building owner should carefully consider the following:

- Unless asbestos-containing materials are removed, there is always the possibility of future fiber release. The action of removing an asbestos material will create a high possibility of fiber release. Consequently, strict controls must be exercised.
- Even if asbestos is removed from part of the building (all exposed locations, for example), it is important to remember that it may remain in other areas such as in chases, behind walls and above fixed ceilings. In the same way, if one type of asbestos is removed (pipe insulation, for example), many other types of asbestos-containing materials may remain in the building.
- Encapsulation of friable acoustical treatment or fireproofing can cause significant fiber release when the first coat of encapsulant is applied. For this reason, surface encapsulation projects may require the same protection and controls as removal, often making them almost as costly as removal. Much like a painted ceiling, an encapsulated surface may require re-encapsulation after five to ten years.
- Because partial removal, encapsulation, and enclosure, do not remove all the fiber sources, establishing an Operations and Maintenance Program is an essential part of these alternatives. The Operations and Maintenance Program includes such elements as employee education and training, posted warnings, and regular inspections.

Although the abatement of asbestos-containing materials is subject to control by regulation, the owner still maintains a large portion of responsibility for the quality of the abatement process. For major abatement projects it is recommended that written specifications be utilized and that air monitoring be conducted by a qualified firm independent of the contractor and retained directly by the owner.

COST CONSIDERATIONS

This report generally considers removal as the recommended option because it reflects the largest initial expenditure the owner may have to consider in budgetary concerns. Most building owners elect to either remove a material immediately or over a phased program. The cost estimates provided anticipate mid range bids in current dollars from the date when the report was compiled. Many variables affect cost estimates which have no standard cost guidelines, such as contractor insurance bonding requirements, owner-requested change orders, consulting and engineering fees for providing bid documents, pre-bid and abatement conferences, site inspections, and project management. These variables can vary from 8-20% of the abatement costs, and are not included in the cost estimates for this report. Smaller projects' variable costs tend to be a higher percentage of the overall cost.

Other variable costs include relocating building occupants, rescheduling activities, and the time of year for abatement. Much abatement work is scheduled for the summer months when mechanical heating systems are shut down. This can place a peak demand on qualified abatement contractors. It is advisable to always plan ahead and bid a project a few months ahead of when the work is scheduled. This approach allows qualified contractors ample time to plan for their work and anticipate their workload which may save the owner some money and increase the quality of the abatement work.

Every abatement option has associated cost implications including establishing an effective Operations and Maintenance Program. An O&M Program requires training of personnel, purchase of equipment and supplies, and manpower to implement the program. The cost will vary as to the size of a building and the severity of the asbestos condition.

DEFINITIONS

BRIDGING ENCAPSULANT

Intended to form a continuous membrane coating over the surface of the asbestos-containing material. Some rough or porous surfaces are very difficult to cover completely, and encapsulant should always be tested for coverage and adhesion. Substrate should be tested to be sure it will support the additional weight of the encapsulant.

DRY REMOVAL

Asbestos-containing materials are removed dry. This method usually releases large numbers of fibers in the work area and is not recommended but may be the only option if very high voltage electrical equipment is present. The local air control authority must be notified prior to the project and must approve the project scope and methods.

ENCAPSULATION

Asbestos-containing material is coated with material specifically formulated to prevent fiber release. The encapsulation option should include maintaining the material in good condition through an Operations and Maintenance Program since damage could cause future fiber release. Most encapsulants require re-application about every five years. Encapsulated materials could be significantly more difficult to remove at a later date. See Penetrating Encapsulant and Bridging Encapsulant.

ENCLOSURE

Asbestos-containing material is separated from the general environment by permanent, durable, airtight barriers such as gypsum board walls, ceilings, etc., to protect the material from damage and prevent the release of fibers. Covering pipe insulation with a PVC jacket or metal jackets is also an enclosure. This option should include an Operations and Maintenance Program since fibers could be released if the enclosure is damaged. Enclosure can be used in addition to encapsulation.

FULL ISOLATION

The process of aerodynamically separating an area from all other adjacent areas of a building typically with layers of plastic sheeting and duct tape. The isolated area is then put under negative pressure through the use of a HEPA exhaust fan. Entry and exit is through a worker decontamination system.

GLOVE BAG

A manufactured plastic bag with inward projecting sleeves and gloves. The top of the bag is designed to be fitted around a pipe or fitting thus sealing that section of material inside the bag. A qualified worker can then remove the asbestos contained in the bag using the built-in gloves.

HEPA EXHAUST FAN

An exhaust fan unit that contains a High Efficiency Particulated Air (HEPA) filter. The filter is capable of filtering 99.97% of particles 0.3 microns or larger. The HEPA filter is typically protected by two or more pre-filters.

MODIFIED ISOLATION

Setting up a full isolation area without installing a full three stage worker decontamination system. Workers should wear protective clothing and respiratory protection. Decontamination typically utilizes a HEPA vacuum.

OPERATIONS AND MAINTENANCE

In areas where asbestos-containing materials are present, or after an encapsulation or enclosure project is identified, and Operations and Maintenance Program may be established. This program generally involves warnings signs and labels being posted, periodic inspections being made, and building users being trained in the proper techniques for disturbing small quantities of asbestos-containing materials. Areas containing free asbestos fibers or large quantities of debris are restricted to properly trained employees equipped with adequate respiratory protection and decontamination facilities. Measures are implemented to prevent the spread of asbestos fibers to occupied areas of the building.

PENETRATING ENCAPSULANT

Designed to soak into the asbestos-containing material and bind fibers together to prevent their release. Penetrating encapsulants should always be tested on the material prior to complete encapsulation to see how well the encapsulant penetrates and bonds the specific material.

PREVENTATIVE MEASURES

Methods taken to control potential fiber release prior to a material's eventual abatement or at the beginning of the Operations and Maintenance Program. These methods generally involve repair, patching, debris clean-up and labelling asbestos material. They can also include the setting of policies to minimize impact of a material, such as prohibiting the throwing of basketballs at an asbestos-containing surfacing material on a gymnasium ceiling.

REMOVAL

Under carefully controlled conditions, asbestos-containing material is removed from the building, placed in sealed containers and disposed of at an EPA approved landfill. Removal is the only option which assures that fibers will not be released in the future. See Wet Removal and Dry Removal.

WET REMOVAL

Asbestos-containing material is wetted with either a removal agent or water/surfactant mixture before it is handled to reduce fiber release.

WORKER DECONTAMINATION SYSTEM

A series of three chambers separated by airlocks providing entry and exit into a Full Isolation work area. The first chamber is a clean room where workers change into disposable clothing. The next area is a shower room where workers cleanse themselves after being in the contaminated isolated work area. The third chamber is an equipment room where workers remove their contaminated disposable clothing. A separate system is installed for bag handling in the bag handling loadout chamber, where bags of debris are double bagged and removed for transportation to the waste site.

ACCREDITATIONS: LAB/INSPECTOR

Tab Three, Section Three

United States Department of Commerce
National Institute of Standards and Technology



Certificate of Accreditation

PBS ENVIRONMENTAL BUILDING CONSULTANTS, INC.
PORTLAND, OR

is recognized under the National Voluntary Laboratory Accreditation Program
for satisfactory compliance with criteria established in Title 15, Part 7 Code of Federal Regulations.
Accreditation is awarded for specific services, listed on the Scope of Accreditation, for:

BULK ASBESTOS FIBER ANALYSIS



For the National Institute of Standards and Technology

April 1, 1995

Effective until

United States Department of Commerce
National Institute of Standards and Technology

NVLAP[®]



ISO/IEC GUIDE 25:1990
ISO/IEC GUIDE 58:1993
ISO 9002:1994

Certificate of Accreditation

RJ LEE GROUP, INC.
BERKELEY LABORATORY
BERKELEY, CA

is recognized under the National Voluntary Laboratory Accreditation Program for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC Guide 25 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results. Accreditation is awarded for specific services, listed on the Scope of Accreditation for.

AIRBORNE ASBESTOS FIBER ANALYSIS

July 1, 1995

Effective until

Albert J. Holzer

For the National Institute of Standards and Technology

A.H.E.R.A.

THIS IS TO CERTIFY THAT

STEPHEN MINASSIAN

HAS ATTENDED

**AHERA INSPECTOR/MANAGEMENT PLANNER
REFRESHER**

TRAINING COURSE

Expiration date: 09/22/95

Course date: 09/22/94

Course location: Seattle, Washington

Certificate: RF-94-3980

Social Security #: 034-36-3980

AHERA is the Asbestos Hazard
Emergency Response Act enacting
Title II of Toxic Substance
Control Act (TSCA)



**ENVIRONMENTAL
BUILDING CONSULTANTS, INC**

For verification of the authenticity of this
certificate contact: PBS Environmental
1220 S.W. Morrison, Portland, OR 97205
(503) 248-1939

A.H.E.R.A.

THIS IS TO CERTIFY THAT

TIM OGDEN

HAS ATTENDED

**AHERA INSPECTOR/MANAGEMENT PLANNER
REFRESHER**

TRAINING COURSE

Expiration date: 09/22/95

Course date: 09/22/94

Course location: Kent, Washington

Certificate: RF-94-7958

Social Security #: 560-13-7958

AHERA is the Asbestos Hazard
Emergency Response Act enacting
Title II of Toxic Substance
Control Act (TSCA)



A handwritten signature in cursive script, appearing to read "David Stone".

**ENVIRONMENTAL
BUILDING CONSULTANTS, INC**

For verification of the authenticity of this
certificate contact: PBS Environmental
1220 S.W. Morrison, Portland, OR 97205
(503) 248-1939

A.H.E.R.A.

THIS IS TO CERTIFY THAT

FRANCIS STOHOSSKY

HAS ATTENDED

**AHERA INSPECTOR/MANAGEMENT PLANNER
REFRESHER**

TRAINING COURSE

Expiration date: 04/28/95

Course date: 04/28/94

Course location: Portland, Oregon

Certificate: RF-94-1103

Social Security #: 542-80-1103

AHERA is the Asbestos Hazard
Emergency Response Act enacting
Title II of Toxic Substance
Control Act (TSCA)



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