

ASBESTOS SURVEY REPORT

STATE OF WASHINGTON
DEPARTMENT OF GENERAL ADMINISTRATION
OLYMPIA, WASHINGTON

SHUMAKER BUILDING (# 94)

E&AS Project #94-260



Prepared by

PBS ENVIRONMENTAL
220 S. Findlay
Seattle, WA 98108
(206) 233-9639

PBS Project Number
7045.20

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:

Shumaker Building #94
Washington State Capitol Campus
Olympia, WA

Client Data

State of WA General Administration
Olympia, WA

Construction Date: 1930-35
Building Area: 3,080 sf
Additions: None

Roof Framing: Wood
Construction Type: Wood
Heating System: Gas/Electric Forced Air

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

Stephen E. Minassian 4/12/95

Signature Date
AHERA Certificate #RF-94-3980

Timothy J. Ogden
Prime Inspector

Timothy J. Ogden 4/12/95

Signature Date
AHERA Certificate #RF-94-7958

Suspect friable and non-friable asbestos-containing materials were surveyed at the Shumaker Building located on the Washington State Capitol Campus, Olympia, WA by PBS Environmental in January, 1995. 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 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

Pink sheet floor covering (Type 2) located on the kitchen counter tested positive for asbestos. The asbestos is located in the friable felt backing. This material is in good condition and is of low concern unless damaged by cutting, tearing, etc.

Window putty located on the exterior windows tested positive for asbestos. This gray pliable material is in good condition and is of low concern.

See Survey Floor Plans (Tab Two, Section Two) for material locations.

Materials which tested positive for asbestos:

Pink Sheet Floor Covering (Type 2)
Window Putty

Materials which tested negative for asbestos:

Gypsum Wallboard Assemblies
12" x 12" White Vinyl Floor Tile (with non-suspect yellow mastic)
Asphaltic Sheet Floor Covering (Type 1)
Ceramic Tile Grout and associated Vapor Barrier Felt
Wall and Ceiling Plaster

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/or 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
Sheet Floor Covering (2) Kitchen Counter	+/- 15 SF	28
Window Putty Exterior Windows	+/- 450 LF	7

Material/Location

Sheet Floor Covering (2)

Kitchen Counter

Ferris Index Scores **Totals**

Accessibility:	HIGH	4
Condition:	GOOD	1
Friability:	NONE	1
Plenum:	NO	1
	Sub-total:	7
% Asbestos	>=51% x	4
	Total:	28

Window Putty

Exterior Windows

Accessibility:	HIGH	4
Condition:	GOOD	1
Friability:	NONE	1
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

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.

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.

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

RESPONSE ACTIONS:

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

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.

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.

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

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

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

PRIORITY: #1

MATERIAL: Sheet Floor Covering (2)

Location: Kitchen Counter

Quantity: +/- 15 SF

Description: Vinyl floor covering manufactured as a sheet product and installed with a minimum of seams. The sheeting generally contains a paper or felt backing that typically contains asbestos.

Samples Taken: 1

Sample Results: Positive

Sample Code(s): 7045.20 -005

Assessment: LOW CONCERN

Accessibility: HIGH

Undamaged Area: GOOD

Current Damage: NONE

Damage Potential: LOW

Friability: MODERATE

Damage Type: NONE

Air Plenum: NO

Damage Cause: NONE

Discussion:

The material presents a relatively low concern in its current condition. Avoid activities that may impact this material. +/- 15 SF of pink sheet floor covering with asbestos-containing felt backing noted in good condition. See floor plans (Tab 2, Section 2) for material locations.

RESPONSE ACTIONS:

Preventative Measures Prior to Abatement:

Do not disturb material without proper training and protection. Continue to implement Operations and Maintenance program.

Recommended Abatement Action:

Remove material under full isolation procedures.

Other Options:

None suggested.

PRIORITY: #2

MATERIAL: Window Putty

Location: Exterior Windows

Quantity: +/- 450 LF

Description: A pliable putty or caulking that can contain asbestos that is used to seat glazing within window frames.

Samples Taken: 1

Sample Results: Positive

Sample Code(s): 7045.20 -007

Assessment: **LOW CONCERN**

Accessibility: HIGH

Undamaged Area: GOOD

Current Damage: NONE

Damage Potential: LOW

Friability: NONE

Damage Type: N/A

Air Plenum: NO

Damage Cause: N/A

Discussion:

Gray glazing compound on edges of window frames found to be predominantly in good condition.

RESPONSE ACTIONS:

Preventative Measures Prior to Abatement:

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

Recommended Abatement Action:

Remove material in regulated area according to applicable regulations.

Other Options:

Maintain material in good condition and routinely apply thick coat of encapsulant (e.g. paint) as needed.

COST ESTIMATES

Tab One, Section Four

Abatement Area	Item	Approx. Quantity	Unit	Unit Price	Abatement Cost Estimate
Throughout Building					
	Sheet Floor Covering (2)	15	EA.	\$3.50	\$52.50
	Window Putty	450	L.F.	\$4.00	\$1,800.00
	Mobilization		L.S.		\$400.00
Area Total:					\$2,252.50
Building Total:					\$2,252.50

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; H.F.= Hard Fittings; 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
7045.20-001	Gypsum/Joint Compound First floor north end	NAD (All layers) PBS
7045.20-002	Gypsum/Joint Compound First floor north end at door frame	NAD PBS
7045.20-003	Vinyl Floor Tile (1)/Mastic 12" x 12" white/yellow mastic 1st floor south	NAD PBS
7045.20-004	Sheet Floor Covering (1) Asphaltic - 1st floor south at entry	NAD PBS
7045.20-005	Sheet Floor Covering (2) Pink - Kitchen Counter	NAD (Pink sheet vinyl) 75% Chrysotile (Gray felt backing) PBS
7045.20-006	Grout/Felt Kitchen ceramic tile counter	NAD (All layers) PBS
7045.20-007	Window Putty Glazing putty - north restroom	2% Chrysotile (gray) PBS
7045.20-008	Wall and Ceiling Plaster Southeast corner ceiling - 1st floor	NAD PBS
7045.20-009	Wall and Ceiling Plaster Basement stairwell	NAD PBS
7045.20-010	Wall and Ceiling Plaster Basement stairwell	NAD R.J. Lee Group




***NAD** = No Asbestos Detected

*Samples will be disposed of after 3/30/95 unless Owner notifies PBS.

SURVEY FLOOR PLANS

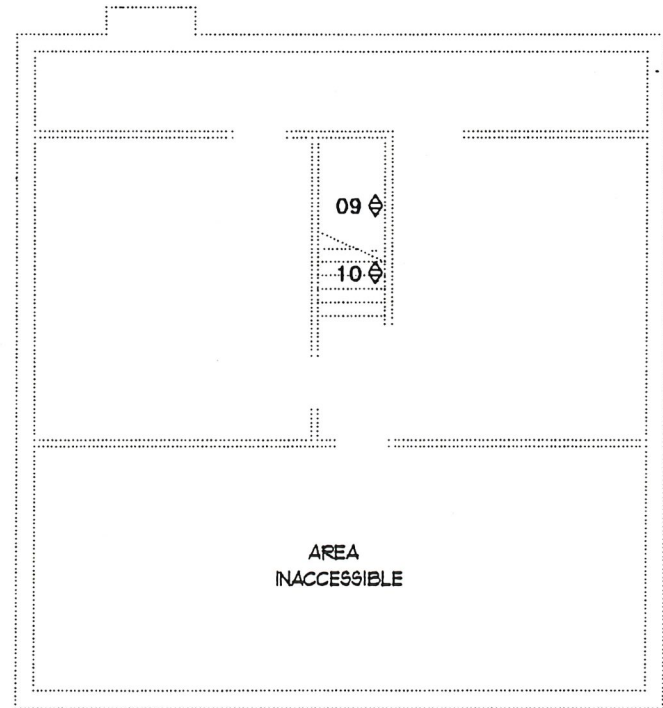
Tab Two, Section Two

LEGEND

-  DRAWING REFERENCE TO BULK SAMPLE FIELD CODE, SEE INVENTORY OF SAMPLES
-  MATERIAL SYMBOL
-  ASBESTOS-CONTAINING SHEET FLOOR COVERING

ASBESTOS SAMPLE SYMBOLS

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



BASEMENT PLAN

SCALE: APPROXIMATELY 1"=10'



NOTES

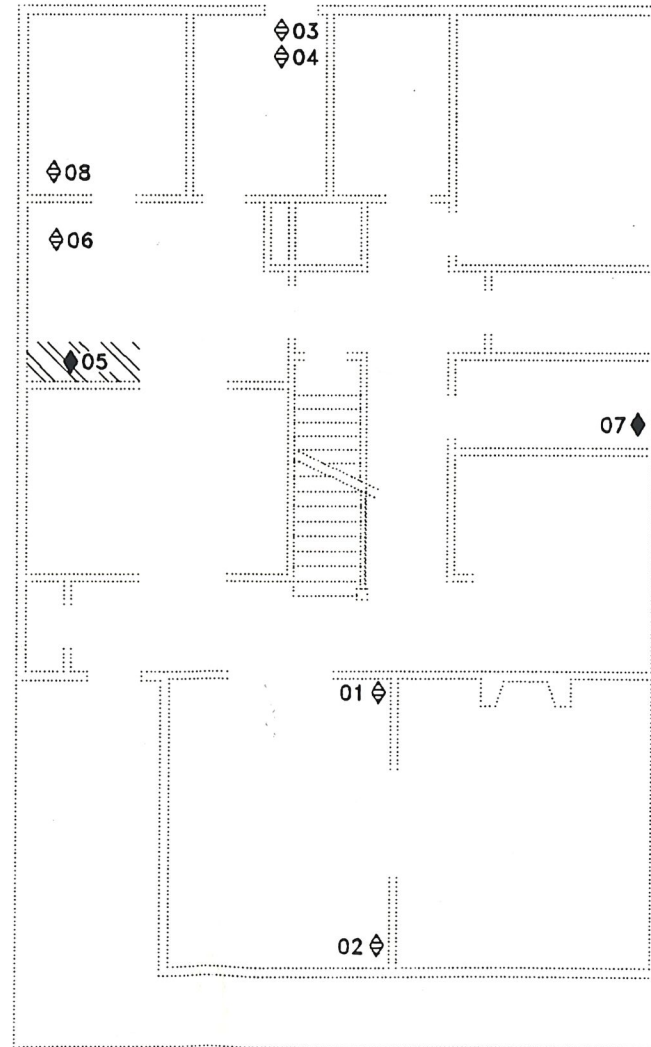
1. THIS DRAWING IS DIAGRAMMATIC. IT IS FOR GENERAL INFORMATION AND SAMPLE LOCATION.
2. ACCESSIBLE SPACES WERE SURVEYED FOR SUSPECT ASBESTOS MATERIALS. SUSPECT MATERIALS FOUND TO BE ASBESTOS-CONTAINING ARE NOTED ON THE DRAWING.
3. FOR DETAILED SAMPLE INFORMATION SEE LABORATORY REPORTS, TAB TWO, SECTION FOUR.
4. FOR MATERIAL IDENTIFICATION SEE PHOTO DOCUMENTATION, TAB TWO, SECTION THREE.
5. ASBESTOS-CONTAINING WINDOW PUTTY LOCATED ON EXTERIOR WINDOWS THROUGHOUT BUILDING.
6. NO ASBESTOS-CONTAINING MATERIALS EXIST ON ATTIC LEVEL.

INVENTORY OF ASBESTOS SAMPLES - BASEMENT

DRAWING REFERENCE CODE	FIELD CODE	LAB RESULT	MATERIAL SAMPLED
◇09	7045.20-009	(-)	WALL PLASTER
◇10	7045.20-010	(-)	WALL PLASTER

INVENTORY OF ASBESTOS SAMPLES - FIRST FLOOR

DRAWING REFERENCE CODE	FIELD CODE	LAB RESULT	MATERIAL SAMPLED
◇01	7045.20-001	(-)/(-)	GYPSUM WALLBOARD/JOINT COMPOUND
◇02	7045.20-002	(-)/(-)	GYPSUM WALLBOARD/JOINT COMPOUND
◇03	7045.20-003	(-)	VINYL FLOOR TILE
◇04	7045.20-004	(-)	SHEET FLOOR COVERING (1)
◆05	7045.20-005	(+)	SHEET FLOOR COVERING (2)
◇06	7045.20-006	(-)/(-)	GROUT/FELT
◆07	7045.20-007	(+)	WINDOW PUTTY
◇08	7045.20-008	(-)	CEILING PLASTER



FIRST FLOOR PLAN

SCALE: APPROXIMATELY 1"=10'



7045.20

704520-1



220 S. FINDLAY
SEATTLE, WA
98108

206/233-9639

ASBESTOS SURVEY PLAN
SHUMAKER
STATE OF WASHINGTON
GENERAL ADMINISTRATION

MAR 1995

1 OF 1

SECTION TWO
2.1

PHOTO DOCUMENTATION

Tab Two, Section Three



A: ASBESTOS-CONTAINING SHEET VINYL;
KITCHEN COUNTER.



B: ASBESTOS-CONTAINING WINDOW PUTTY;
EXTERIOR WINDOW.

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.

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: 2/08/95
1058 Capitol Way Date Received: 2/08/95
Olympia, WA 98504 Client Project ID: N/A
PBS Project No.: 7045.20
Page No.: 1 of 5

Client Sample ID : 7045.20-001

PBS Lab ID: 95-00-467

	<u>LAYER 1</u>	<u>LAYER 2</u>
Percent of Sample:	70%	30%
<u>Asbestiform Mineral Fibers</u>		
Total % Asbestos Fibers:	NAD	NAD
<u>Other Fibers</u>		
Cellulose	10%	75%

NO ASBESTOS DETECTED

COMMENTS: Layer 1: White friable, Layer 2: Beige/white paper.
Sample ashed.

Client Sample ID : 7045.20-002

PBS Lab ID: 95-00-468

Percent of Sample: 100%

Asbestiform Mineral Fibers

Total % Asbestos Fibers: NAD

Other Fibers
None Detected

NO ASBESTOS DETECTED

COMMENTS: Friable, White.

BULK SAMPLE ASBESTOS ANALYSIS

Client: Washington Department of General Ser Report Date: 2/08/95
1058 Capitol Way Date Received: 2/08/95
Olympia, WA 98504 Client Project ID: N/A
PBS Project No.: 7045.20
Page No.: 2 of 5

Client Sample ID : 7045.20-003
PBS Lab ID: 95-00-469

Percent of Sample: 100%

Asbestiform Mineral Fibers

Total % Asbestos Fibers: NAD

Other Fibers

None Detected

NO ASBESTOS DETECTED

COMMENTS: Tile, Mottled-beige.

Client Sample ID : 7045.20-004
PBS Lab ID: 95-00-470

Percent of Sample: 100%

Asbestiform Mineral Fibers

Total % Asbestos Fibers: NAD

Other Fibers

Cellulose 55%

NO ASBESTOS DETECTED

COMMENTS: Tar paper, Black. Sample ashed.

BULK SAMPLE ASBESTOS ANALYSIS

Client: Washington Department of General Ser Report Date: 2/08/95
1058 Capitol Way Date Received: 2/08/95
Olympia, WA 98504 Client Project ID: N/A
PBS Project No.: 7045.20
Page No.: 3 of 5

Client Sample ID : 7045.20-005
PBS Lab ID: 95-00-471

	<u>LAYER 1</u>	<u>LAYER 2</u>
Percent of Sample:	45%	55%
<u>Asbestiform Mineral Fibers</u>		
Chrysotile	-	75%
Total % Asbestos Fibers:	NAD	75%
<u>Other Fibers</u>		
Cellulose	-	15%

COMBINED TOTAL % ASBESTOS: 42%

COMMENTS: Layer 1: Pink sheet vinyl, Layer 2: Gray felt backing.

Client Sample ID : 7045.20-006
PBS Lab ID: 95-00-472

	<u>LAYER 1</u>	<u>LAYER 2</u>
Percent of Sample:	50%	50%
<u>Asbestiform Mineral Fibers</u>		
Total % Asbestos Fibers:	NAD	NAD
<u>Other Fibers</u>		
Cellulose	1%	60%

NO ASBESTOS DETECTED

COMMENTS: Layer 1: Gray cementitious, Layer 2: Brown/black tar paper.
Sample ashed.

BULK SAMPLE ASBESTOS ANALYSIS

Client: Washington Department of General Ser Report Date: 2/08/95
1058 Capitol Way Date Received: 2/08/95
Olympia, WA 98504 Client Project ID: N/A
PBS Project No.: 7045.20
Page No.: 4 of 5

Client Sample ID : 7045.20-007
PBS Lab ID: 95-00-473

Percent of Sample: 100%

Asbestiform Mineral Fibers

Chrysotile 2%

Total % Asbestos Fibers: 2%

Other Fibers

Cellulose 1%

TOTAL % ASBESTOS: 2%

COMMENTS: Compoundlike, Gray. Sample ashed.

Client Sample ID : 7045.20-008
PBS Lab ID: 95-00-474

Percent of Sample: 100%

Asbestiform Mineral Fibers

Total % Asbestos Fibers: NAD

Other Fibers

Cellulose 1%

Hair 1%

NO ASBESTOS DETECTED

COMMENTS: Plaster, White/gray.

BULK SAMPLE ASBESTOS ANALYSIS

Client: Washington Department of General Ser Report Date: 2/08/95
1058 Capitol Way Date Received: 2/08/95
Olympia, WA 98504 Client Project ID: N/A
PBS Project No.: 7045.20
Page No.: 5 of 5

Client Sample ID : 7045.20-009
PBS Lab ID: 95-00-475

Percent of Sample: 100%

Asbestiform Mineral Fibers

Total % Asbestos Fibers: NAD

Other Fibers

Cellulose 3%
Hair 1%

NO ASBESTOS DETECTED

COMMENTS: Plaster, White/gray.

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

NAD = No Asbestos Detected. NIST accreditation may not be used to claim product endorsement by NVLAP or any agency of the U.S. Government. This report relates only to the items tested. Testing method is per 40 CFR 763 Subpart F, Appendix A, PLM. Samples will be disposed of in 90 days.


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	Other NonFibrous	Run Date
1524565CPL White coarse plaster	7045.20-010	-	-	-	-	-	<1 Tr %	-	-	-	-	100 %	1/31/95
NFM: Qtz, Carb, Opaq, Hbl, Gyp, F-Spar, Paint, Fine Grains, Misc. Part. KZ Homogeneous													

RJ Lee Group, Inc.
Berkeley

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

Authorized Signature  _____
Date Friday, February 3, 1995
Phone (510) 486-8319
Fax (510) 486-0927

P B S
ENVIRONMENTAL

TRANSMITTAL AND CHAIN OF CUSTODY
FOR
BULK SAMPLES

Project No. 7045.20

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

RECEIVER

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

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

Condition of Package: OK

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

Rollie Champe
Name Rollie 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.

7045.20-001	_____
7045.20-002	_____
7045.20-003	_____
7045.20-004	_____
7045.20-005	_____
7045.20-006	_____
7045.20-007	_____
7045.20-008	_____
7045.20-009	_____

95-00-467
-468
-469
-470
-471
-472
-473
-474
-475

Please analyze the enclosed 9 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

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, an 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.

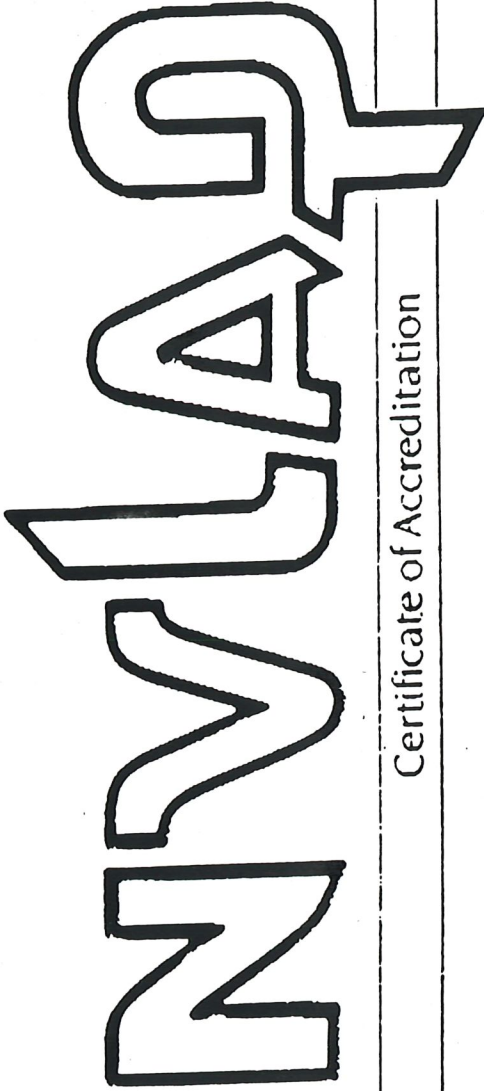
WORKER DECONTAMINATION SYSTEM

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

April 1, 1995

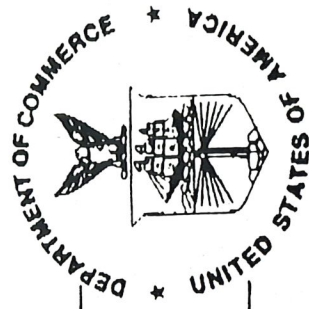
Effective until



For the National Institute of Standards and Technology

United States Department of Commerce
National Institute of Standards and Technology

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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


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**

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