

ASBESTOS SURVEY REPORT

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

INSTITUTIONS BUILDING (# 15)

E&AS Project #94-260



Prepared by

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**PBS Project Number
7045.01**

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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:

Institutions Building - (#15)
Washington State Capitol Campus
Olympia, WA

Client Data

State of WA General Administration
Olympia, WA

Construction Date: 1934
Building Area: 28,910 sf
Additions: None

Roof Framing: Concrete
Construction Type: Concrete
Heating System: Radiant/Forced Air Steam

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 (ACMs) were surveyed at the Institutions 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.

For management purposes, fire doors throughout the building are assumed to contain asbestos. Investigation and/or testing of individual doors should be performed prior to any impact. (See Survey Process, Tab 3, Section 1 for further discussion.)

Findings

Friable asbestos-containing air cell and felt pipe insulation and associated hard fittings exist on the steam heat and domestic hot water piping systems in the attic and second floor pipe chase. This material is damaged in the attic space and debris is present. Access to this area should be restricted until repair or abatement occurs.

Felt pipe insulation found in the second floor pipe chase was observed in good condition. This pipe chase is open to the attic. Access to this area should be restricted to minimize damage potential and to prevent fiber migration from the attic area.

The roof access is reached via the second floor pipe chase and attic area. This access should be restricted and/or isolated from the remainder of the attic until repair or abatement of the attic pipe insulation occurs.

Asbestos-containing hard fittings on fiberglass pipe insulation were found in the basement in good condition. The remainder of the asbestos-containing pipe insulation (aircell, felt, and associated hard fittings) is concealed within wall and ceiling spaces.

Non-friable 9" x 9" floor tiles and associated mastic found in the basement were found to contain asbestos. The asbestos-containing floor tiles located in the basement include the red, dark red, and tan colored tile. (Gray and light red colored tile tested negative). All floor tile mastic in the basement tested positive for asbestos, except the mastic associated with the light red colored tile. These materials are a low concern in their present condition.

The black and white 9" x 9" tiles and associated mastic found throughout the first and second floors tested negative for asbestos. No other non-friable asbestos-containing materials were found.

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

Materials which tested positive for asbestos:

9" x 9" Floor Tiles and Associated Mastic in Basement
(Gray floor tiles are non-asbestos with asbestos-containing mastic,
light red floor tiles and mastic are non-asbestos.)

Air Cell Pipe Insulation

Felt Pipe Insulation

Materials which tested negative for asbestos:

Gypsum Wallboard, Tape, and Joint Compound

Glued-on Ceiling Tiles and Mastic

Cove Base and Mastic

Lay-in Ceiling Tiles

Plaster

Black/White 9" x 9" Floor Tile/Border and Mastic

Light Red 9" x 9" Floor Tile and Mastic

Gray 9" x 9" Floor Tile

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
Air Cell Pipe Insulation/Hard Fittings Second floor crawl space and concealed.	+/- 1175 LF	32
Fire Doors Throughout Building	+/- 30 EA.	28
Hard Fittings/Fiberglass Basement (North) and concealed	+/- 90 HF	24
Felt Wrap Pipe Insulation/Hard Fittings Second floor pipe chase and concealed	+/- 300 LF	6
Mastic assoc. with Vinyl Floor Tile (2, 3, 6) Basement	+/- 210 SF	6
Vinyl Floor Tile (1, 4) Basement	+/- 4000 SF	6

Material/Location

Air Cell Pipe Insulation/Hard Fittings
Second floor crawl space and concealed.

Ferris Index Scores		Totals
Accessibility:	LOW	3
Condition:	MILD	2
Friability:	HIGH	4
Plenum:	NO	1
	Sub-total:	8
% Asbestos	>51% x	4
	Total:	32

Fire Doors
Throughout Building

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

Hard Fittings/Fiberglass
Basement (North) and concealed

Accessibility:	LOW	3
Condition:	GOOD	1
Friability:	MODERATELY	3
Plenum:	NO	1
	Sub-total:	8
% Asbestos	26-50% x	3
	Total:	24

Felt Wrap Pipe Insulation/Hard Fittings
Second floor pipe chase and concealed

Accessibility:	LOW	3
Condition:	MILD	2
Friability:	SLIGHTLY	2
Plenum:	NO	1
	Sub-total:	6
% Asbestos	1-10% x	1
	Total:	6

Vinyl Floor Tile (1, 4)
Basement

Accessibility:	HIGH	4
Condition:	MILD	2
Friability:	NONE	1
Plenum:	NO	1
	Sub-total:	6
% Asbestos	1-10% x	1
	Total:	6

Material/Location

Mastic assoc. with Vinyl Floor Tile (2, 3, 6)
Basement

Ferris Index Scores		Totals
Accessibility:	HIGH	4
Condition:	MILD	2
Friability:	NONE	1
Plenum:	NO	1
	Sub-total:	6
% Asbestos	1-10% x	1
	Total:	6

ASSESSMENTS/RECOMMENDATIONS

Tab One, Section Three

PRIORITY: #1

MATERIAL: Air Cell Pipe Insulation/Hard Fittings

Location: Second floor crawl space and concealed.

Quantity: +/- 1175 LF

Description: Air Cell/Hard Fittings: Trade name for manufactured corrugated heavy paper pipe insulation and associated hard insulating cement on pipe fittings. Pipe insulation was typically fitted around a pipe and held in place with lagging.

Samples Taken: 1

Sample Results: Positive

Sample Code(s): 7045.01 028

Assessment: MODERATE

Accessibility: MODERATE

Current Damage: MODERATE

Friability: MODERATE/NONE

Air Plenum: NO

Undamaged Area: GOOD

Damage Potential: MODERATE/LOW

Damage Type: IMPACT

Damage Cause: AGE, VIBRATION, MAINTENANCE

Discussion:

Outer layer of lagging reduces the friability classification. If the lagging becomes damaged, the exposed material is moderately to highly friable. Only exposed pipes were documented. It is likely that insulated pipe runs are enclosed in ceiling and wall spaces. Debris was noted at damage sites. Repair should include debris removal.

RESPONSE ACTIONS:

Preventative Measures Prior to Abatement:

Immediately isolate area and restrict access to only trained personnel. Repair material. Label material and continue to implement Operations & Maintenance program.

Recommended Abatement Action:

Glove bag removal as required in conjunctions with other activities. Remove material under modified isolation (critical barriers, negative pressure, worker protection) using glovebags.

Other Options:

None suggested.

PRIORITY: #2

MATERIAL: Felt Wrap Pipe Insulation/Hard Fittings

Location: Second floor pipe chase and concealed

Quantity: +/- 300 LF

Description: Felt Wrap Pipe/Hard Fittings: Layers of heavy felt pipe insulation and associated hard insulating cement on fittings. Felts are typically thicker than paper layers. Two halves were generally fitted around a pipe and held in place with lagging.

Samples Taken: 1

Sample Results: Positive

Sample Code(s): 7045.01 029

Assessment: MODERATE TO LOW CONCERN

Accessibility:	MODERATE	Undamaged Area:	GOOD
Current Damage:	MODERATE	Damage Potential:	MODERATE
Friability:	MODERATE/NONE	Damage Type:	IMPACT
Air Plenum:	NO	Damage Cause:	MAINTENANCE

Discussion:

Outer layer of lagging reduces the friability classification. If the lagging becomes damaged, the exposed material is moderately to highly friable. Only exposed pipes were documented. It is likely that insulated pipe runs are in enclosed ceiling and wall spaces. There are +/- 30 LF accessible in pipe chase. The chase is open to the attic area.

RESPONSE ACTIONS:

Preventative Measures Prior to Abatement:

Immediately isolate area and restrict access to only trained personnel. Repair damaged material. Label material and continue to implement Operations & Maintenance program.

Recommended Abatement Action:

Glove bag removal as required in conjunctions with other activities.

Other Options:

Avoid storing material in pipe chase to minimize damage/exposure potential.

PRIORITY: #3

MATERIAL: Hard Fittings/Fiberglass

Location: Basement (North) and concealed

Quantity: +/- 90 HF

Description: Hard Fittings/Fiberglass: An insulating cement packed around pipe fittings such as elbows, valves, tees, etc. The hard cement is typically protected by lagging compound contiguous with the adjacent fiberglass pipe insulation.

Samples Taken: 1

Sample Results: Postive

Sample Code(s): 015-045-038

Assessment: MODERATE TO LOW CONCERN

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

Discussion:

Outer layer of lagging reduces the friability classification. If the lagging becomes damaged, the exposed material is moderately to highly friable. Only exposed hard fittings were documented. It is likely that hard fittings are enclosed in ceiling and wall spaces. There are +/- 29 exposed hard fittings located in North end of basement see floor plans, Tab 2, Section 2). There are +/- 60 hard fittings concealed throughout buil

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:

Glove bag removal as soon as feasible.

Other Options:

None suggested.

PRIORITY: #4

MATERIAL: Vinyl Floor Tile (1, 4)

Location: Basement
Quantity: +/- 4000 SF
Description: 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.

Samples Taken: 4
Sample Results: Positive
Sample Code(s): 7045.01 023

Assessment: MODERATE TO LOW CONCERN

Accessibility:	HIGH	Undamaged Area:	GOOD
Current Damage:	MODERATE	Damage Potential:	MODERATE
Friability:	MODERATE/NONE	Damage Type:	WATER, IMPACT
Air Plenum:	NO	Damage Cause:	AGE

Discussion:
Floor tiles and mastic pose a relatively low concern unless made friable through sanding, drilling, cutting, etc. Use of abrasive floor buffers should be avoided. Floor tile (types 1 and 4) and associated mastic contain asbestos. (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 using controlled isolated conditions: wet methods, HEPA vacuum, and proper worker protection.

Other Options:

None suggested.

PRIORITY: #5

MATERIAL: Mastic assoc. with Vinyl Floor Tile (2, 3, 6)

Location: Basement

Quantity: +/- 210 SF

Description: 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.

Samples Taken: 5

Sample Results: Mixed

Sample Code(s): 7045.01 (-/+) 017, (-/+) 022, (-/+) 023, (-/-) 024, (-/+) 025

Assessment: MODERATE TO LOW CONCERN

Accessibility:	HIGH	Undamaged Area:	GOOD
Current Damage:	MODERATE	Damage Potential:	LOW
Friability:	MODERATE/NONE	Damage Type:	WATER, IMPACT
Air Plenum:	NO	Damage Cause:	AGE

Discussion:

Floor tiles and mastic pose a relatively low concern unless made friable through sanding, drilling, cutting, etc. Use of abrasive floor buffers should be avoided. Floor tile (types 2, 3, and 6) is non-asbestos over asbestos containing mastic.

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 using controlled isolated conditions: wet methods, HEPA vacuum, and proper worker protection.

Other Options:

None suggested.

PRIORITY: #6

MATERIAL: Fire Doors

Location: Throughout Building

Quantity: +/- 30 EA.

Description: A door with a core filled with an asbestos-containing material. It usually has an Underwriters Laboratory (U.L.) listing for resistance to fire. Fire rated doors can have metal or wood on the exterior skin.

Samples Taken: None

Sample Results: Assumed

Sample Code(s): N/A

Assessment: LOW CONCERN

Accessibility: MODERATE

Undamaged Area: GOOD

Current Damage: NONE

Damage Potential: LOW

Friability: MODERATE

Damage Type: N/A

Air Plenum: NO

Damage Cause: N/A

Discussion:

Fire doors should be monitored for damage, preventing impact to the friable core of the door. Fire doors in building are assumed to contain asbestos and should be tested prior to any impact.

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:

None required after enacting preventative measures.

Other Options:

None suggested.

COST ESTIMATES

Tab One, Section Four

Abatement Area	Item	Approx. Quantity	Unit	Unit Price	Abatement Cost Estimate
Throughout Bldg.					
(Concealed)	Aircell pipe insul./HFs	600	L.F.	\$18.00	\$10,800.00
(Concealed)	Felt pipe insul./HFs	270	L.F.	\$18.00	\$4,860.00
(Concealed)	HFs/Fiberglass	60	H.F.	\$18.00	\$1,080.00
(Exposed)	HFs/Fiberglass	30	H.F.	\$18.00	\$540.00
	Fire Doors	30	EA.	\$275.00	\$8,250.00
	Mobilization		L.S.		\$800.00
				Area Total:	\$26,330.00
Attic Crawlspace/ 2nd Fl. Pipe Ch					
(Exposed)	Aircell pipe insul./HFs	575	L.F.	\$18.00	\$10,350.00
(Exposed)	Felt pipe insul./HFs	30	L.F.	\$18.00	\$540.00
	Mobilization		L.S.		\$400.00
	Pre-cleaning (Attic)		L.S.		\$175.00
				Area Total:	\$11,465.00
Basement Level					
	Vinyl Floor Tile types 1, 2, 3, 4, & 6)/Mastic	4210	S.F.	\$3.00	\$12,630.00
	Mobilization		L.S.		\$800.00
				Area Total:	\$13,430.00
				Building Total:	\$51,225.00

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; H.F. = Hard Fittings; EA. = Each.
- 3) Fire doors in building are assumed to contain asbestos. Quantity indicated is an estimate and confirmation of the presence of asbestos in doors is recommended.

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.

Abatement Area	Item	Quantity	Unit	Unit Price	Abatement Cost Estimate
Throughout Bldg.					
(Concealed)	Aircell pipe insul./HFs	600	L.F.	\$12.00	\$7,200.00
(Concealed)	Felt pipe insul./HFs	270	L.F.	\$12.00	\$3,240.00
(Concealed)	HFs/Fiberglass	60	L.F.	\$12.00	\$720.00
(Exposed)	HFs/Fiberglass	30	L.F.	\$12.00	\$360.00
	Mobilization		L.S.		\$950.00
Area Total:					\$12,470.00
Attic Crawlspace/ 2nd Fl. Pipe Ch					
(Exposed)	Aircell pipe insul./HFs	575	L.F.	\$12.00	\$6,900.00
(Exposed)	Felt pipe insul./HFs	30	L.F.	\$12.00	\$360.00
	Mobilization		L.S.		\$400.00
	Pre-cleaning (Attic)		L.S.		\$175.00
Area Total:					\$7,835.00
Basement Level					
	Vinyl Floor Tile types 1, 2, 3, 4, & 6)/Mastic	4210	S.F.	\$2.00	\$8,420.00
	Mobilization		L.S.	\$750.00	\$750.00
Area Total:					\$9,170.00
Building Total:					\$29,475.00

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.

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
7045.01-001	Vinyl Floor Tile (1)/Mastic Basement; south hall @ stair	5% Chrysotile (red tile) 2% Chrysotile (mastic) R.J. Lee Group
7045.01-002	Vinyl Floor Tile (1) Basement; SE hall @ door	>3% Chrysotile (red tile) >2% Chrysotile (mastic) R.J. Lee Group
7045.01-003	Lay-in Ceiling Tile (1) B36 @ entry	NAD R.J. Lee Group
7045.01-004	Lay-in Ceiling Tile (1) Basement; NE storage under stair	NAD R.J. Lee Group
7045.01-005	Lay-in Ceiling Tile (1) Basement N/S hall @ B19	NAD R.J. Lee Group
7045.01-006	Gypsum Wallboard B36-E; north wall	NAD R.J. Lee Group
7045.01-007	Gypsum Wallboard B22; ceiling at center	NAD R.J. Lee Group
7045.01-008	Gypsum Wallboard Basement; NE hall @ light switch	NAD R.J. Lee Group
7045.01-009	Wall and Ceiling Plaster B36; W of entry at baseboard	NAD R.J. Lee Group

* N.A.D. = No Asbestos Detected

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

CODE	MATERIAL / LOCATION	ANALYSIS / LAB
7045.01-010	Wall and Ceiling Plaster Basement; NE stairwell above door	NAD R.J. Lee Group
7045.01-011	Wall and Ceiling Plaster Basement; NE stairwell @ light sw	NAD R.J. Lee Group
7045.01-012	Wall and Ceiling Plaster Basement; south stair wall	NAD PBS
7045.01-013	Wall and Ceiling Plaster Basement; south stair ceiling	NAD PBS
7045.01-014	Wall and Ceiling Plaster 1st floor; south stair; west wall	NAD PBS
7045.01-015	Wall and Ceiling Plaster 1st floor; S stair; W wall @ door	NAD PBS
7045.01-016	Glued-on Ceiling Tiles/Mastic (II) Basement; N/E storage @ stair	NAD R.J. Lee Group
7045.01-017	Vinyl Floor Tile(3)/Mastic Basement; north hall	>1% Chrysotile (mastic) NAD (red tile) R.J. Lee Group
7045.01-018	Vinyl Floor Tile (5)/Mastic Basement; E entry @ ramp	NAD R.J. Lee Group
7045.01-019	Vinyl Floor Tile (4)/Mastic B10 @ door; Basement	>1% Chrysotile (yellow tile) 3% Chrysotile (mastic) R.J. Lee Group

* N.A.D. = No Asbestos Detected

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

CODE	MATERIAL / LOCATION	ANALYSIS / LAB
7045.01-020	Vinyl Floor Tile (4)/Mastic B10 @ E wall; Basement	>5% Chrysotile (yellow tile) 5% Chrysotile (mastic) R.J. Lee Group
7045.01-021	Covebase/Mastic B10; E wall; Basement	NAD R.J. Lee Group
7045.01-022	Vinyl Floor Tile (6)/Mastic B06; S/W corner; Basement	5% Chrysotile (mastic) NAD (gray tile) R.J. Lee Group
7045.01-023	Vinyl Floor Tile (6)/Mastic B06; W wall; @ sink	5% Chrysotile (mastic) NAD (gray tile) R.J. Lee Group
7045.01-024	Vinyl Floor Tile (2)/Mastic Basement; S stair landing	<1% Chrysotile (brown tile) <1% Chrysotile (mastic) R.J. Lee Group
7045.01-025	Vinyl Floor Tile (2)/Mastic Basement hall @ B5; SE crnr	<1% Chrysotile (brown tile) 2% Chrysotile (mastic) R.J. Lee Group
7045.01-026	Vinyl Floor Tile (7)/Mastic 1st floor hall @ S stair	NAD (all layers) R.J. Lee Group

* **N.A.D.** = No Asbestos Detected

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

CODE	MATERIAL / LOCATION	ANALYSIS / LAB
7045.01-027	Vinyl Floor Tile (7)/Mastic 2nd floor hall @ S stair	NAD R.J. Lee Group
7045.01-028	Air cell pipe insulation 2nd floor S pipe chase	60% Chrysotile PBS
7045.01-029	Felt pipe insulation South attic	12% Chrysotile PBS

* N.A.D. = No Asbestos Detected

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

SURVEY FLOOR PLANS

Tab Two, Section Two

LEGEND

7 → DRAWING REFERENCE TO BULK SAMPLE FIELD CODE, SEE INVENTORY OF SAMPLES
 MATERIAL SYMBOL

 ASBESTOS-CONTAINING FLOOR TILE AND MASTIC OR NON-ASBESTOS FLOOR TILE OVER ASBESTOS-CONTAINING MASTIC

③ → CIRCLED NUMBERS INDICATE THE APPROX. NUMBER AND LOCATION OF ASBESTOS-CONTAINING HARD FITTINGS ON FIBERGLASS INSULATED PIPE.

(4) NUMBERS IN PARENTHESES INDICATE THE TYPE AND LOCATION OF FLOOR TILE

ASBESTOS SAMPLE SYMBOLS

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

NOTES

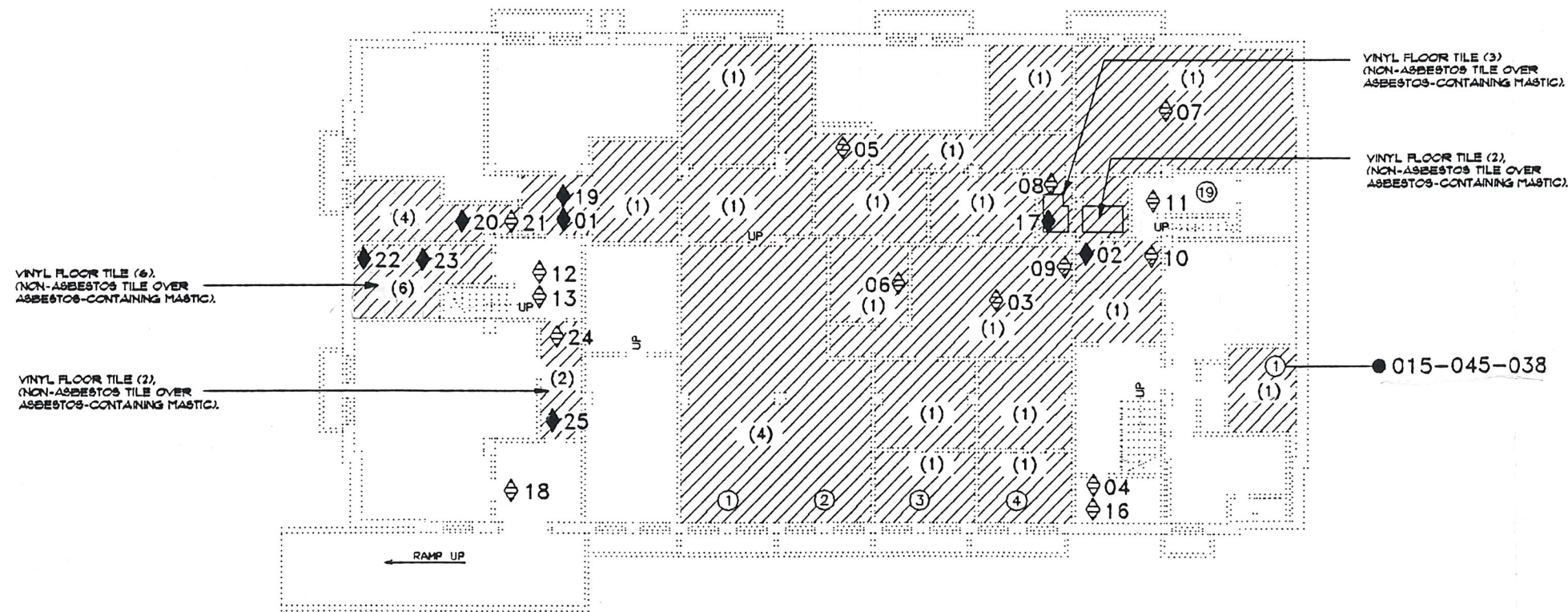
- THIS DRAWING IS DIAGRAMMATIC. IT IS FOR GENERAL INFORMATION AND SAMPLE LOCATION.
- ACCESSIBLE SPACES WERE SURVEYED FOR SUSPECT ASBESTOS MATERIALS. SUSPECT MATERIALS FOUND TO BE ASBESTOS-CONTAINING ARE NOTED ON THE DRAWING.
- FOR DETAILED SAMPLE INFORMATION SEE LABORATORY REPORTS, TAB TWO, SECTION FOUR.
- FOR MATERIAL IDENTIFICATION SEE PHOTO DOCUMENTATION, TAB TWO, SECTION TWO.
- +/- 600 LINEAR FEET AIR CELL PIPE INSULATION ASSUMED TO BE CONCEALED WITHIN WALLS AND CEILINGS THROUGHOUT BLDG.
- +/- 270 LINEAR FEET FELT PIPE INSULATION ASSUMED TO BE CONCEALED WITHIN WALLS AND CEILINGS THROUGHOUT BLDG.
- +/- 60 ASBESTOS-CONTAINING HARD FITTINGS ON FIBERGLASS INSULATED PIPE ASSUMED TO BE CONCEALED WITHIN WALLS AND CEILINGS THROUGHOUT BUILDING.
- +/- 30 FIRE RATED DOORS LOCATED THROUGHOUT BUILDING ASSUMED TO CONTAIN ASBESTOS.

INVENTORY OF ASBESTOS SAMPLES - BASEMENT

DRAWING REFERENCE	FIELD CODE	LAB RESULT	MATERIAL SAMPLED
◆01	7045.02-001	(+)/(+)	VINYL FLOOR TILE/MASTIC (1)
◆02	7045.02-002	(+)/(+)	VINYL FLOOR TILE/MASTIC (1)
◇03	7045.02-003	(-)	LAY-IN CEILING TILE (1)
◇04	7045.02-004	(-)	LAY-IN CEILING TILE (1)
◇05	7045.02-005	(-)	LAY-IN CEILING TILE (1)
◇06	7045.02-006	(-)	GYPSUM WALLBOARD
◇07	7045.02-007	(-)	GYPSUM WALLBOARD
◇08	7045.02-008	(-)	GYPSUM WALLBOARD
◇09	7045.02-009	(-)	WALL AND CEILING PLASTER
◇10	7045.02-010	(-)	WALL AND CEILING PLASTER
◇11	7045.02-011	(-)	WALL AND CEILING PLASTER
◇12	7045.02-012	(-)	WALL AND CEILING PLASTER
◇13	7045.02-013	(-)	WALL AND CEILING PLASTER
◇16	7045.02-016	(-)	GLUED-ON CEILING TILES/MASTIC (2)
◆17	7045.02-017	(-)/(+)	VINYL FLOOR TILE/MASTIC (3)
◆18	7045.02-018	(-)/(-)	VINYL FLOOR TILE/MASTIC (5)
◆19	7045.02-019	(+)/(+)	VINYL FLOOR TILE/MASTIC (4)
◆20	7045.02-020	(+)/(+)	VINYL FLOOR TILE/MASTIC (4)
◇21	7045.02-021	(-)	COVERED BASE/MASTIC
◆22	7045.02-022	(-)/(+)	VINYL FLOOR TILE/MASTIC (6)
◆23	7045.02-023	(-)/(+)	VINYL FLOOR TILE/MASTIC (6)
◇24	7045.02-024	(-)/(-)	VINYL FLOOR TILE/MASTIC (2)
◆25	7045.02-025	(-)/(+)	VINYL FLOOR TILE/MASTIC (2)

INVENTORY OF PREVIOUS ASBESTOS SAMPLES - BASEMENT

●015-045-038	(+)	HARD FITTING ON FIBERGLASS
--------------	-----	----------------------------



BASEMENT FLOOR PLAN
 SCALE: 1"=20'



T045.01
 T04501-B



220 S. FINLAY
 SEATTLE, WA
 98108
 206/233-9639

ASBESTOS SURVEY PLAN
 INSTITUTIONS BUILDING
 STATE OF WASHINGTON
 GENERAL ADMINISTRATION

DEC 1994

1 OF 3

SECTION TWO
 2.1

LEGEND

↖ 7 → DRAWING REFERENCE TO BULK SAMPLE FIELD CODE, SEE INVENTORY OF SAMPLES
 — MATERIAL SYMBOL

ASBESTOS SAMPLE SYMBOLS

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

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 TWO.
5. +/- 600 LINEAR FEET AIR CELL PIPE INSULATION ASSUMED TO BE CONCEALED WITHIN WALLS AND CEILINGS.
6. +/- 270 LINEAR FEET FELT PIPE INSULATION ASSUMED TO BE CONCEALED WITHIN WALLS AND CEILINGS THROUGHOUT BLDG.
7. +/- 60 ASBESTOS-CONTAINING HARD FITTINGS ON FIBERGLASS INSULATED PIPE ASSUMED TO BE CONCEALED WITHIN WALLS AND CEILINGS THROUGHOUT BUILDING.
8. +/- 30 FIRE RATED DOORS LOCATED THROUGHOUT BUILDING ASSUMED TO CONTAIN ASBESTOS.

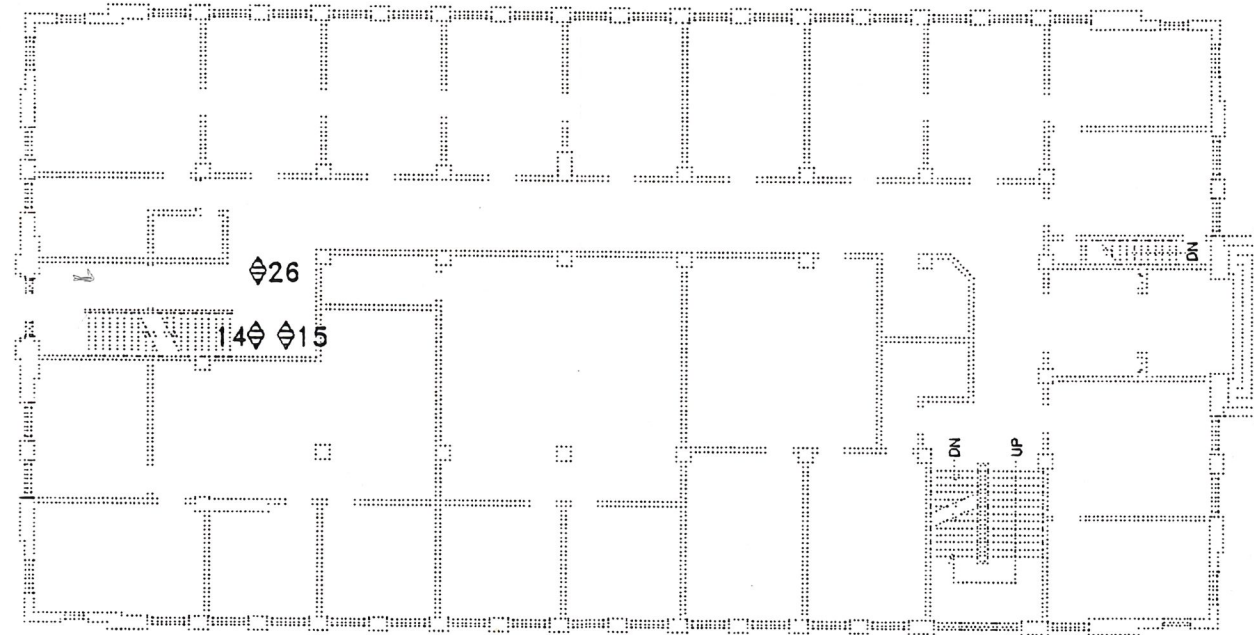
INVENTORY OF ASBESTOS SAMPLES - FIRST FLOOR

DRAWING REFERENCE	FIELD CODE	LAB RESULT	MATERIAL SAMPLED
◇ 14	7045.02-14	(-)	WALL AND CEILING PLASTER
◇ 15	7045.02-15	(-)	WALL AND CEILING PLASTER
◇ 26	7045.02-26	(-)	VINYL FLOOR TILE/ MASTIC (7)

7045.01
704501-1



220 S. FINDLAY
SEATTLE, WA
98108
206/233-9639



FIRST FLOOR PLAN

SCALE: 1"=20'



ASBESTOS SURVEY PLAN
INSTITUTIONS BUILDING
STATE OF WASHINGTON
GENERAL ADMINISTRATION

DEC 1994

2 OF 3

SECTION TWO
2.1

LEGEND

 DRAWING REFERENCE TO BULK SAMPLE FIELD CODE, SEE INVENTORY OF SAMPLES
 MATERIAL SYMBOL

ASBESTOS SAMPLE SYMBOLS

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

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 TWO.
5. +/- 600 LINEAR FEET AIR CELL PIPE INSULATION ASSUMED TO BE CONCEALED WITHIN WALLS AND CEILINGS THROUGHOUT BLDG.
6. +/- 270 LINEAR FEET FELT PIPE INSULATION ASSUMED TO BE CONCEALED WITHIN WALLS AND CEILINGS THROUGHOUT BLDG.
7. +/- 60 ASBESTOS-CONTAINING HARD FITTINGS ON FIBERGLASS INSULATED PIPE ASSUMED TO BE CONCEALED WITHIN WALLS AND CEILINGS THROUGHOUT BLDG.
8. +/- 575 LINEAR FEET 4' TO 8' AIR CELL AND FELT PIPE INSULATION WITHIN ATTIC CRAWLSPACE.
9. +/- 30 FIRE RATED DOORS LOCATED THROUGHOUT BUILDING ASSUMED TO CONTAIN ASBESTOS.

INVENTORY OF ASBESTOS SAMPLES - SECOND FLOOR

DRAWING REFERENCE	FIELD CODE	LAB RESULT	MATERIAL SAMPLED
◇27	7045.01-027	(-)/(-)	FLOOR TILE/MASTIC (7)
●28	7045.01-028	(+)	AIR CELL PIPE INSULATION
●29	7045.01-029	(+)	FELT WRAP PIPE INSULATION

7045.01
704501-2



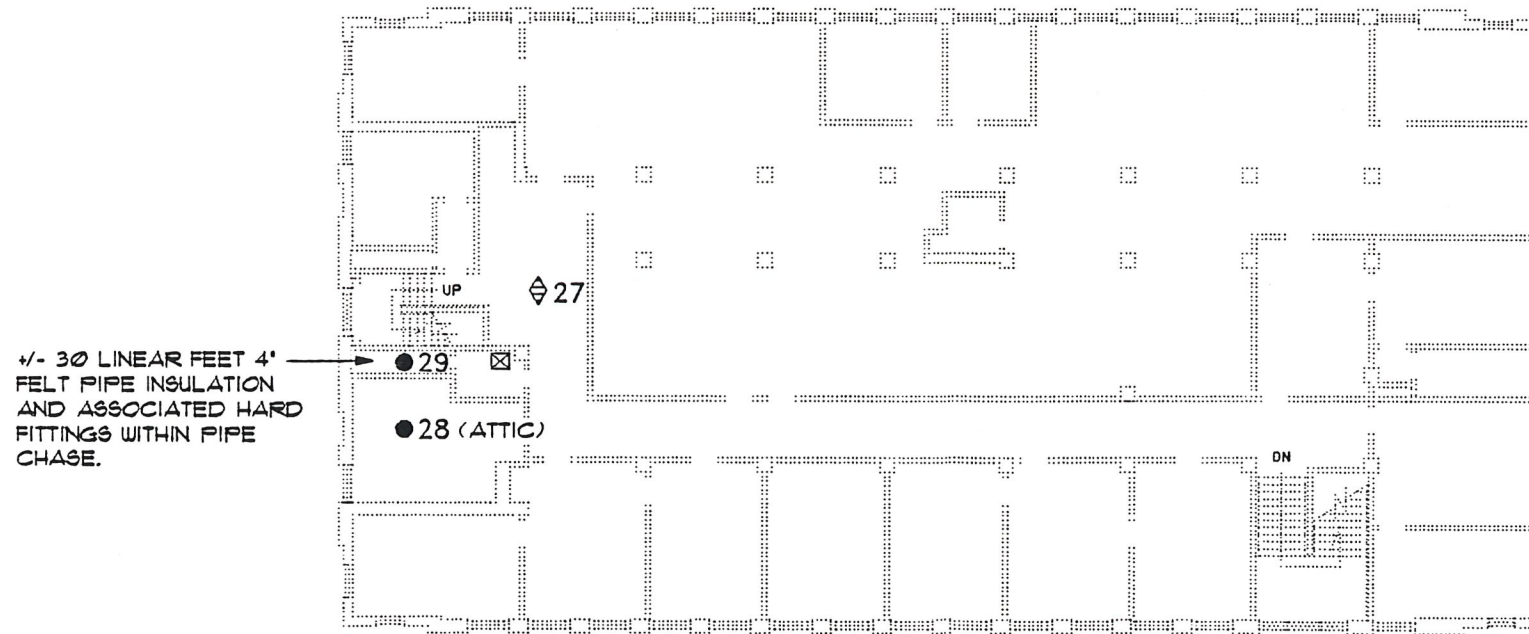
220 S. FINLAY
SEATTLE, WA
98108
206/233-9639

ASBESTOS SURVEY PLAN
INSTITUTIONS BUILDING
STATE OF WASHINGTON
GENERAL ADMINISTRATION

DEC 1994

3 OF 3

SECTION TWO
2.1



1/2- 30 LINEAR FEET 4' FELT PIPE INSULATION AND ASSOCIATED HARD FITTINGS WITHIN PIPE CHASE.

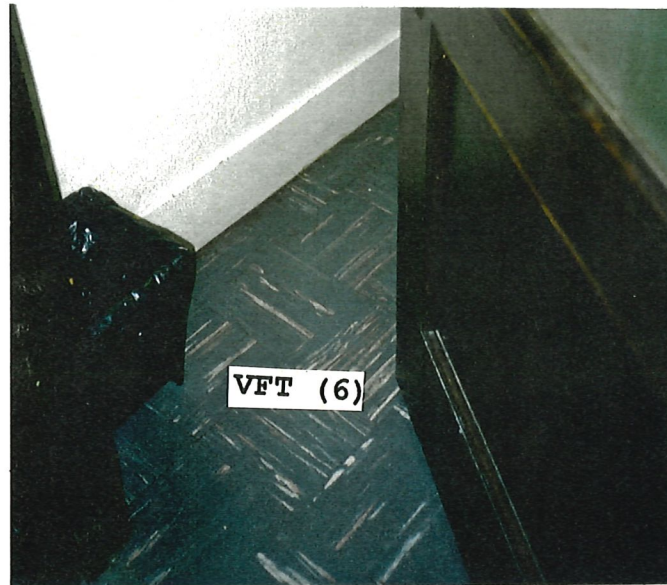
SECOND FLOOR PLAN

SCALE: 1"=20'



PHOTO DOCUMENTATION

Tab Two, Section Three



NON-ASBESTOS FLOOR TILE w/ ASBESTOS-CONTAINING MASTIC;
EAST STAIRWELL ROOM; BASEMENT LEVEL.



ASBESTOS-CONTAINING FELT WRAP PIPE
INSULATION; SECOND FLOOR PIPE CHASE AT
ATTIC ACCESS.



ASBESTOS-CONTAINING AIR CELL PIPE
INSULATION; ATTIC CRAWLSPACE AT ROOF
ACCESS.

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.
- Data from previous sampling by the Owner is included following PBS survey data.

Table I

Polarized Light Analysis Results Project AOC410215

Sample Number / Sample Appearance	Client Sample Number	Asbestos										Nonasbestos			Other NonFibrous Run Date	Analyst				
		Chrysotile	Amosite	Crocidolite	Anthophyllite	Tremolite	Actinolite	Cellulose	Wool	Mineral Glass	Fibrous Fibers	Synthetic Fibers	Mica	Mag.			Misc. Part.			
1519465CPL	7045.01-001	5 %	-	-	-	-	-	-	-	-	-	-	-	-	-	-	95 %	10/12/94	ES	
Red floor tile with mastic																				
Layer Content:	Tile: 5% Chrysotile; Mastic: 2% Chrysotile																			
1519466CPL	7045.01-002	>3 %	-	-	-	-	-	-	-	-	-	-	-	-	-	-	97 %	10/12/94	ES	
Red floor tile with mastic																				
Layer Content:	Tile: >3% Chrysotile; Mastic: >2% Chrysotile																			
1519467CPL	7045.01-003	-	-	-	-	20 %	55 %	20 %	-	-	-	-	-	-	-	-	5 %	10/12/94	ES	
Ceiling tile																				
1519468CPL	7045.01-004	-	-	-	-	25 %	50 %	20 %	-	-	-	-	-	-	-	-	5 %	10/12/94	ES	
Ceiling tile																				
1519469CPL	7045.01-005	-	-	-	-	25 %	50 %	20 %	-	-	-	-	-	-	-	-	5 %	10/12/94	ES	
Ceiling tile																				
1519470CPL	7045.01-006	-	-	-	-	10 %	-	-	-	-	-	-	-	-	-	-	90 %	10/12/94	ES	
Pink sheetrock																				
1519471CPL	7045.01-007	-	-	-	-	10 %	-	-	-	-	-	-	-	-	-	-	90 %	10/12/94	ES	
White sheetrock																				
1519472CPL	7045.01-008	-	-	-	-	15 %	-	-	-	-	-	-	-	-	-	-	85 %	10/12/94	ES	
White sheetrock with paint																				

[Signature]

Authorized Signature _____
Date Thursday, October 13, 1994

2424 Sixth Street
Berkeley, CA 94710
Page: 1 of 4

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

RJ Lee Group, Inc.
Berkeley

Table I

Polarized Light Analysis Results Project AOC410215

Sample Number / Sample Appearance	Client Sample Number	Asbestos										Nonasbestos										Other NonFibrous Run Date	Analyst						
		Chrysotile	Amosite	Crocidolite	Anthophyllite	Tremolite	Actinolite	Cellulose	Wool	Glass	Fibers	Synthetic	Fibers	Fibers	Material	Material	Material	Material	Material	Material									
1519473CPL Coarse plaster with white-green paint	7045.01-009	-	-	-	-	-	<1 Tr %	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	99+ %	10/12/94	ES	
NFM: Qtz, Carb, Opaq, Hbl, Mag, F-Spar, Mica, Misc. Part.																													
1519474CPL Coarse plaster with white-green paint	7045.01-010	-	-	-	-	-	5 %	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	95 %	10/12/94	ES
NFM: Qtz, Carb, Opaq, Hbl, Gyp, F-Spar, Mica, Clay, Misc. Part.																													
1519475CPL Coarse plaster with white-green paint	7045.01-011	-	-	-	-	-	10 %	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	90 %	10/12/94	ES
NFM: Carb, Opaq, Gyp, F-Spar, Mica, Clay, Misc. Part.																													
1519476CPL Brown adhesive	7045.01-016	-	-	-	-	-	2 %	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 %	97 %	10/12/94	ES
NFM: Opaq, Adhesive, Misc. Part.																													
1519477CPL Red floor tile with mastic	7045.01-017	-	-	-	-	-	<1 Tr %	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	99+ %	10/12/94	ES
Mastic: >1% Chrysotile; Other Layer: <1 None Detected																													
1519478CPL Red floor tile	7045.01-018	-	-	-	-	-	1 %	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	99 %	10/12/94	ES
NFM: Qtz, Carb, Binder, Opaq, Gyp, Mag, Mica, Clay, Misc. Part.																													
1519479CPL Yellow floor tile with mastic	7045.01-019	-	-	-	-	-	>1 %	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	99 %	10/12/94	ES
NFM: Qtz, Carb, Tar, Binder, Opaq, Gyp, Mag, Mica, Misc. Part.																													
1519480CPL Yellow floor tile with mastic	7045.01-020	-	-	-	-	-	>5 %	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	95 %	10/12/94	ES
NFM: Qtz, Carb, Tar, Opaq, Clay, Misc. Part.																													
Layer Content: Tile: >5% Chrysotile; Mastic: 5% Chrysotile																													

Edgar

Authorized Signature _____ Date Thursday, October 13, 1994

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

2424 Sixth Street
Berkeley, CA 94710
Page: 2 of 4

RJ Lee Group, Inc.
Berkeley

Table I

Polarized Light Analysis Results

Project AOC410215

Sample Number / Sample Appearance	Client Sample Number	Asbestos				Nonasbestos				Run Date			
		Chrysotile	Amosite	Crocidolite	Anthophyllite	Tremolite	Actinolite	Cellulose	Wool		Glass Fibers	Synthetic Fibers	Other Material
1519481CPL Brown adhesive	7045.01-021	-	-	-	-	1 %	-	-	-	-	10 %	89 %	10/12/94
NFM: Qtz, Opaq, Adhesive, Misc. Part.												ES	
1519482CPL Grey floor tile with mastic	7045.01-022	<1 Tr %	-	-	-	<1 Tr %	-	-	-	-	<1 %	99+ %	10/12/94
Mastic: 5% Chrysotile; Other Layer: <1 None Detected												ES	
1519483CPL Grey floor tile with mastic	7045.01-023	<1 Tr %	-	-	-	-	-	-	-	-	-	99+ %	10/12/94
Mastic: 5% Chrysotile; Other Layer: <1 None Detected												ES	
1519484CPL Brown floor tile with mastic	7045.01-024	<1 Tr %	-	-	-	-	-	-	-	-	-	99+ %	10/12/94
Mastic: 5% Chrysotile; Other Layer: <1 None Detected												ES	
1519485CPL Brown floor tile with mastic	7045.01-025	<1 Tr %	-	-	-	-	-	-	-	-	-	99+ %	10/12/94
Mastic: 2% Chrysotile												ES	
1519486CPL Fibrous insulation material with black material	7045.01-026	-	-	-	-	60 %	-	-	-	10 %	-	30 %	10/12/94
All Layers: <1 None Detected												ES	
1519487CPL Grey linoleum with fibrous material and black backing	7045.01-027	-	-	-	-	70 %	-	-	-	-	-	30 %	10/12/94
Mastic: 5% Chrysotile; Other Layer: <1 None Detected												ES	

Authorized Signature _____ Date Thursday, October 13, 1994

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

2424 Sixth Street
Berkeley, CA 94710
Page: 3 of 4

RJ Lee Group, Inc.
Berkeley

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: 10/28/94
1058 Capitol Way Date Received: 10/28/94
Olympia, WA 98504 Client Project ID: N/A
PBS Project No.: 7045.01
Page No.: 1 of 2

Client Sample ID : 7045.01-012

PBS Lab ID: 94-04-929

Percent of Sample: 100%

Asbestiform Mineral Fibers

Total % Asbestos Fibers: NAD

Other Fibers

Cellulose 3%

NO ASBESTOS DETECTED

COMMENTS: Plaster, Lt.gray.

Client Sample ID : 7045.01-013

PBS Lab ID: 94-04-930

Percent of Sample: 100%

Asbestiform Mineral Fibers

Total % Asbestos Fibers: NAD

Other Fibers

Cellulose 2%

NO ASBESTOS DETECTED

COMMENTS: Plaster, Lt.gray.

BULK SAMPLE ASBESTOS ANALYSIS

Client: Washington Department of General Ser Report Date: 10/28/94
1058 Capitol Way Date Received: 10/28/94
Olympia, WA 98504 Client Project ID: N/A
PBS Project No.: 7045.01
Page No.: 2 of 2

Client Sample ID : 7045.01-014
PBS Lab ID: 94-04-931

Percent of Sample: 100%

Asbestiform Mineral Fibers

Total % Asbestos Fibers: NAD

Other Fibers

Cellulose 3%

NO ASBESTOS DETECTED

COMMENTS: Plaster, Lt.gray/cream.

Client Sample ID : 7045.01-015
PBS Lab ID: 94-04-932

Percent of Sample: 100%

Asbestiform Mineral Fibers

Total % Asbestos Fibers: NAD

Other Fibers

Cellulose 1%

NO ASBESTOS DETECTED

COMMENTS: Plaster, Lt.gray/cream.

Reviewed by:

Rollie A. Champs
Approved Signatory

Analyst(s): Man Ninh

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

ULK SAMPLE ASBESTOS ANALYSIS

Client: Washington Department of General Ser Report Date: 11/08/94
1058 Capitol Way Date Received: 11/08/94
Olympia, WA 98504 Client Project ID: N/A
PBS Project No.: 7045.01
Page No.: 1 of 1

Client Sample ID : 7045.01-028
PBS Lab ID: 94-04-962

Percent of Sample: 100%

Asbestiform Mineral Fibers

Chrysotile	60%
Total % Asbestos Fibers:	60%

Other Fibers

Cellulose	10%
Cotton	15%

TOTAL % ASBESTOS: 60%

COMMENTS: Friable, Gray.

Client Sample ID : 7045.01-029
PBS Lab ID: 94-04-963

Percent of Sample: 100%

Asbestiform Mineral Fibers

Chrysotile	12%
Total % Asbestos Fibers:	12%

Other Fibers

Cellulose	70%
Cotton	5%
Hair	3%

TOTAL % ASBESTOS: 12%

COMMENTS: Friable, Gray.

Reviewed by:

Lisa Jones
Approved Signatory

Analyst(s): Man Ninh

ACC 4/10/215

**P B S
ENVIRONMENTAL**

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

Project No. 7045.01

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: October 12, 1994
PBS Environmental
Attn:
270 S. Hanford, Suite 209
Seattle, WA 98134
(206) 233-9639

Cheri Ashby
Cheri Ashby 10/12/94
Authorized Signature Date

RECEIVER

DATE RECEIVED 10/12 10:00 AM
COMPANY R.J. Lee Group, Inc.
ADDRESS 2424 6th Street
Berkeley, CA 94710

Condition of Packages: Good
B. L. ...
Name _____
Authorized Signature _____ Date _____

Sender's ID No.

Brief Description
(May be left blank when sending bulk samples)

Receiver's ID No.

7045.01-001	_____	_____
7045.01-002	_____	_____
* 7045.01-003	_____	_____
* 7045.01-004	_____	_____
* 7045.01-005	_____	_____
7045.01-006	_____	_____
7045.01-007	_____	_____
7045.01-008	_____	_____
** 7045.01-009	_____	_____
** 7045.01-010	_____	_____
** 7045.01-011	_____	_____
7045.01-012	_____	_____
7045.01-017	_____	_____
7045.01-018	_____	_____
7045.01-019	_____	_____
7045.01-020	_____	_____
7045.01-021	_____	_____
7045.01-022	_____	_____
7045.01-023	_____	_____
7045.01-024	_____	_____
7045.01-025	_____	_____
7045.01-026	_____	_____
7045.01-027	_____	_____

Please analyze the enclosed 23 samples for asbestos content using PCM with dispersion staining. PMS requests prior notification if samples will be disposed. Request verbal results by: _____ AM/PM Date

vid sets -> analyze non-invasively

P B S
ENVIRONMENTAL

TRANSMITTAL AND CHAIN OF CUSTODY
FOR
BULK SAMPLES

Project No. 7045.01

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: October 25, 1994
PBS Environmental
Attn:
1220 S.W. Morrison, Suite 600
Portland, Oregon 97205
(503) 248-1939

DATE RECEIVED 25 OCT 1994
COMPANY PBS Laboratory
ADDRESS 1220 S.W. Morrison #600
Portland, OR 97205

Condition of Package: OK

Dawn Conway
Name
Dawn Conway 10/25/94
Authorized Signature Date

Rollie Champe
Name
Rollie A. Champe 25 OCT 1994
Authorized Signature Date

Sender's ID No.	Brief Description (May be left blank when sending bulk samples)	Receiver's ID No.
7045.01-012	_____	94-04-929
7045.01-013	_____	↓ -930
7045.01-014	_____	↓ -931
7045.01-015	_____	↓ -932

Please analyze the enclosed 4 samples for asbestos content using PLM with dispersion staining. PBS requests prior notification if samples will be disposed. Request verbal results by: _____ AM/PM _____ Date

P B S
ENVIRONMENTAL

TRANSMITTAL AND CHAIN OF CUSTODY
FOR
BULK SAMPLES

Project No. 7045.01

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: October 31, 1994
PBS Environmental
Attn:
270 S. Hanford, Suite 209
Seattle, WA 98134
(206) 233-9639

Nicole Zick
Name
Nicole Zick 10/30/94
Authorized Signature Date

RECEIVER

DATE RECEIVED 31 OCT 1994
COMPANY PBS Laboratory
ADDRESS 1220 S.W. Morrison #600
Portland, OR 97205

Condition of Package: OK

ROLLE CHAMPE
Name
Follie A. Champe 31 OCT 1994
Authorized Signature Date

Sender's ID No.	Brief Description (May be left blank when sending bulk samples)	Receiver's ID No.
7045.01-028		<u>94-04-962</u>
7045.01-029		<u>94-04-963</u>

Please analyze the enclosed 2 samples for asbestos content using PLM with dispersion staining. PBS requests prior notification if samples will be disposed. Request verbal results by: _____ AM/PM _____ Date



TERRA TEST
Analytical Laboratories, Inc.

015-044-037

Amosite 5 - 30%
Chrysotile 5 - 30%

Glass Fiber
Cellulose Fil

sample description: beige powdery matrix with two fiber types

015-045-038

Chrysotile 5 - 30%

Glass Fiber
Cellulose Fil

sample description: beige mixture with some woven
cellulose fabric

015-046-039

Chrysotile 60 - 100%

Cellulose Fil

sample description: grey mats of fabric, also yellow
woven material

015-047-040

Chrysotile 5 - 30%

Cellulose Fi

sample description: grey fibrous mixture with some white cellulose
woven fabric

015-048-041

Chrysotile 5 - 30 %

Glass Fiber
Cellulose Fi

sample description: similar to sample 015-047-040

Analyst: Pedro G. Armenta Date: 8-9-88

The reported analysis do not constitute an endorsement by Terra Test. Results are based upon samples provided to Terra Test assumes no responsibility for the collection of such samples, and in no event shall be held liable for any consequential damages resulting from the use of this analysis. In no event shall Terra's liability exceed the fee ed for this analysis.

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.

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 currents, 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 Environmental Protection Agency's Asbestos Hazard Emergency Response Act (AHERA) 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.

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.

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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.)

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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 area 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

April 1, 1995

Effective until



For the National Institute of Standards and Technology

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:

BULK ASBESTOS FIBER ANALYSIS

July 1, 1995

Effective until

Albert P. 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)

PBS



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BUILDING CONSULTANTS, INC**

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certificate contact: **PBS Environmental**
1220 S.W. Morrison, Portland, OR 97205
(503) 248-1939