

3732 CHARTER PARK DRIVE

SUITE A

SAN JOSE, CA 95136

TEL: 408.448.7594

TOLL FREE: 800.988.7424

FAX: 408.448.3849



ASBESTOS SURVEY REPORT

CANG Vehicle Maintenance Transportation Building (ID: Building 146)

NASA-AMES
Moffett Field
Mt. View, CA 94035

BUILDING INSPECTIONS

ENVIRONMENTAL ENGINEERING

SPECIALIZED TRAINING

CONTRACT MANAGEMENT

Prepared for:
NASA - AMES (PAI CORPORATION)
Nasa-ames Research Center
Moffett Field, CA 94035-1000

Prepared by:
Benchmark Environmental Engineering
November 29, 2001
Project Number: **E01-448-A-SU**

Prepared By:

A handwritten signature in black ink, appearing to read "Terri MacFarlane", written over a horizontal line.

Terri MacFarlane
a California Certified Asbestos Consultant
90-2747

Reviewed By:

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Terri MacFarlane
a California Certified Asbestos Consultant
90-2747

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Executive Summary

Benchmark Environmental Engineering (Benchmark) was retained by NASA - Ames (PAI Corporation) to perform an Asbestos Hazard Emergency Response Act (AHERA) style asbestos survey of the CANG Vehicle Maintenance Transportation Building (Building ID: Building 146), to determine the locations of accessible and to the extent feasible, inaccessible friable and non-friable asbestos containing building materials (ACBM).

This inspection included interior and exterior spaces. Pre-existing survey data was used to help provide a picture of existing condition of this building. Benchmark collected additional samples of the construction material to help supplement existing data, to contradict existing data or to provide additional data of materials not perviously identified.

Asbestos was detected in the following friable (or jacketed friable) materials:

- Pipe Elbows
- Pipe Insulation

Asbestos was detected in the following non-friable materials:

- Mastic
- Miscellaneous
- Roofing Material
- Hvac Vibration Cloth

The following materials were assumed to contain asbestos:

- Fire Door
- Transite, Interior Panelling
- Transite Panel
- Transite Pipe

Section 1 Introduction

Benchmark Environmental Engineering (Benchmark) performed an Asbestos Hazard Emergency Response Act (AHERA) style asbestos survey of the CANG Vehicle Maintenance Transportation Building located at Moffett Field, Mt. View, CA, to identify ACBM. This report identifies the locations and asbestos content of friable and non-friable ACBM, provides assessment of the friable ACBM in relation to the material's hazard potential to building occupants and provides removal cost estimates.

This inspection included interior and exterior spaces. Pre-existing survey data was used to help provide a picture of existing condition of this building. Benchmark collected additional samples of the construction material to help supplement existing data, to contradict existing data or to provide additional data of materials not perviously identified.

All identified suspect asbestos-containing materials are summarized in Section 3. Materials testing positive for asbestos including material assessments, recommended response actions, and quantities are described in Section 4. Removal cost estimates for asbestos-containing materials are included in Section 5.

Removal cost estimates (Section 5) are for budgeting purposes only and should not be used as a quote for removal of the materials. It is not our recommendation to remove these materials unless they are beyond repair, or planned demolition or renovation activities will disturb the materials. Estimates are based on recent pricing we have received from contractors performing similar work and may vary from actual prices obtained due to the actual scope of work, quantity of material removed, control measures specified and contractor work loads.

On Wednesday, August 1, 2001 Terri MacFarlane (90-2747) , a California Certified Asbestos Consultant and Roy J. Mabus (92-0191) , a California Certified Asbestos Consultant, from Benchmark, performed an asbestos survey of the building(s) in accordance with the Asbestos Hazard and Emergency Response Act of 1987 (AHERA).

DISCLAIMER

This report is prepared for the express use and benefit of NASA - Ames (PAI Corporation), its agents and employees. The information in this report or portions thereof may be required to be included in notifications to employees, contractors or other visitors to the building(s). This report is not intended to be used as a specification or work plan for any of the work suggested or recommended in this report.

This report is based upon conditions observed at the property and information made available to the surveyor. This report does not intend to identify all hazards or unsafe

conditions, nor to indicate that other hazards or unsafe conditions do not exist at the premises.

Section 2 Description of Building Construction and Systems

Number of Floors: 2 **Year Built:** 1952 **Total Square Footage:** 32,865

Structural components consist of: Concrete Foundation
Steel Columns

Exterior Wall construction components consist of: Metal
Transite

Interior Wall construction components consist of: Drywall
Plaster

Interior ceiling components consist of: Ceiling Tile

Roofing construction components consist of: Rolled Composite

Building Description/Comments:

The construction on this building is steel frame over a concrete foundation. The two-story building has a flat composite roof with an exterior constructed of yellow corrugated metal and transite. The non-com vehicle maintenance building was built in 1952.

Comments:

Tetra Tech, Inc. conducted an asbestos survey on January 27, 1993. The 9x9 floor tile and the brown resilient sheet flooring which were noticed in the previous survey have been abated.

Section 3 Summary of Findings for Suspect Materials

The following table is a list of all materials at this building which were tested for the presence of asbestos or were assumed to contain asbestos along with overall sample results. Complete information on asbestos containing materials is included in Section 4 of this report.

Each unique material within the building is assigned a unique HM number by the surveyor at the time the survey is performed.

Section 3 and Section 4 are organized by building, surfacing, thermal systems insulation, flooring, walls, ceilings, roofing and miscellaneous materials.

Site Information

CANG Vehicle Maintenance Transportation Building (Site ID: Parcel 5)
Moffett Field

Client Information

NASA - Ames (PAI Corporation)
NASA-Ames Research Center
Moffett Field, CA 94035-1000

Survey Performed By

Benchmark Environmental Engineering

Inspector

Terri MacFarlane

Inspection Date

Wednesday, August 1, 2001

Job Number

E01-448-A-SU

<i>Suspect Material</i>	<i>Category</i>	<i>HM Number</i>	<i>Material Location(s)</i>	<i>Asbestos Present?</i>
Roofing Material	Roofing	RM-1	EXTERIOR	Yes
Transite Panel	Miscellaneous	TP-2	EXTERIOR	Yes ..
Plaster	Surfacing	PL-3	THROUGHOUT THE BULDING	No
Wall - Board	Walls	WLBO-4	WEST	No
12" White Ceiling Tile	Ceilings	CT-5	SOUTHWEST	No
12" Tan Floor Tile	Flooring	FT-6	SOUTHWEST	No
Coving Mastic	Miscellaneous	MASTIC-7	NORTHWEST AND SOUTH	No
2' x 4' Grooved Ceiling Tile	Ceilings	CT-8	SOUTHWEST	No
Fire Door	Miscellaneous	FD-9	NORTH AND SOUTHWEST	Yes ..
1" TSI Pipe Insulation	TSI	PI-10	SOUTHEAST	Yes
1" TSI Pipe Elbows	TSI	PE-11	SOUTHEAST	Yes
Textured Wall - Board #1	Walls	WLBO-12	SOUTHEAST	No
2' x 4' Pinhole Ceiling Tile	Ceilings	CT-13	SOUTHEAST	No
Wall - Plaster	Walls	WLPL-15	SOUTHEAST	No
Textured Wall - Board #2	Walls	WLBO-17	SOUTHEAST	No
Transite, Interior Panelling		311-18	SOUTHEAST	Yes ..

Site Information

CANG Vehicle Maintenance Transportation Building (Site ID:

Survey Performed By

Benchmark Environmental Engineering

Inspection Date

Wednesday, August 1, 2001

Suspect Material	Category	HM Number	Material Location(s)	Asbestos Present?
2" TSI Pipe Insulation	TSI	PI-19	SOUTHEAST	Yes
2" TSI Pipe Elbows	TSI	PE-20	SOUTHEAST	Yes
Tank Cover TSI Miscellaneous	Miscellaneous	MI-21	SOUTHEAST	Yes
12" Transite Pipe	Miscellaneous	TE-22	SOUTHEAST	Yes
Hvac Vibration Cloth	TSI	VC-23	WEST	Yes
24" Transite Pipe	Miscellaneous	TE-24	WEST	Yes
6" Transite Pipe	Miscellaneous	TE-25	WEST	Yes
Floor Tile Mastic	Miscellaneous	MASTIC-26	SOUTHWEST AND SOUTHEAST	Yes
Ceiling Tile Mastic	Miscellaneous	MASTIC-27	SOUTHWEST	No
12 x 12 Gray/White Floor Tile	Flooring	FT-28		No
Leveling Compound	Flooring	LC-29		No

Section 4 Material Information Tables

Site Information

CANG Vehicle Maintenance Transportation Building (Site ID: Parcel 5)
Moffett Field
Mt. View, CA 94035

Client Information

NASA - Ames (PAI Corporation)
NASA-Ames Research Center
Moffett Field, CA 94035-1000

Survey Performed By

Benchmark Environmental Engineering

Inspector

Terri MacFarlane

Inspection Date

Wednesday, August 1, 2001

Job Number

E01-448-A-SU

<i>Material Description</i>			<i>Material Number</i>	<i>Asbestos Present?</i>
Roofing Material			RM-1	Yes
<i>Material Category</i>	<i>Friable Classification</i>	<i>EPA Category</i>	<i>Total Quantity</i>	<i>Unit of Measure</i>
Roofing	Non-Friable	Category I	37,877	Square Feet
<i>General Condition</i>	<i>Damage Category</i>	<i>Overall Material Assessment</i>	<i>Recommended Response</i>	
		Not Assessed under AHERA	Abate Prior to Demolition	
<i>General Material Comments</i>				

Material Location(s)

EXTERIOR

<i>Sample ID(s)</i>	<i>Sample Location(s)</i>	<i>Floor</i>	<i>Analyzed</i>	<i>Overall Result</i>	<i>Layer(s) Reported by Lab</i>	<i>Results by Layer</i>
rm-1-01-5077-146-17	Core - East		Yes	0%	1) Roofing core 2) 3)	Non Detected
rm-1-01-5078-146-18	Core - West		Yes	0%	1) Roofing core 2) 3)	Non Detected
rm-1-01-5079-146-19	Parch		Yes	0%	1) Roofing material 2) 3)	Non Detected
rm-1-01-5080-146-20	Penetration - North		Yes	8%	1) Roof penetration 2) 3)	8 % Chrysotile
rm-1-01-5081-146-21	Penetration - South		Yes	8%	1) Roofing material 2) 3)	8 % Chrysotile

<i>Material Description</i>			<i>Material Number</i>	<i>Asbestos Present?</i>
Transite Panel			TP-2	Yes (assumed)
<i>Material Category</i>	<i>Friable Classification</i>	<i>EPA Category</i>	<i>Total Quantity</i>	<i>Unit of Measure</i>
Miscellaneous	Non-Friable	Category II	21,420	Square Feet
<i>General Condition</i>	<i>Damage Category</i>	<i>Overall Material Assessment</i>	<i>Recommended Response</i>	
		Not Assessed under AHERA	Abate Prior to Demolition	
<i>General Material Comments</i>				

Material Location(s)

EXTERIOR

<i>Sample ID(s)</i>	<i>Sample Location(s)</i>	<i>Floor</i>	<i>Analyzed</i>	<i>Overall Result</i>	<i>Layer(s) Reported by Lab</i>	<i>Results by Layer</i>
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Section 4 Material Information Tables

Site Information

CANG Vehicle Maintenance Transportation Building (Site ID: _____)

Inspection Date

Wednesday, August 1, 2001

Material Description Plaster			Material Number PL-3	Asbestos Present? No
Material Category Surfacing	Friable Classification Friable	EPA Category Friable	Total Quantity 10,464	Unit of Measure Square Feet
General Condition	Damage Category	Overall Material Assessment No Assessment, Non-asbestos	Recommended Response	

General Material Comments

Material Location(s)

THROUGHOUT THE BULDING

Sample ID(s)	Sample Location(s)	Floor	Analyzed	Overall Result	Layer(s) Reported by Lab	Results by Layer
pl-3-146-H03-A			Yes	0%	1) Plaster 2) 3)	Non Detected
pl-3-146-H03-B			Yes	0%	1) Plaster 2) 3)	Non Detected
pl-3-146-H03-C			Yes	0%	1) Plaster 2) 3)	Non Detected
pl-3-146-H03-D			Yes	0%	1) Plaster 2) 3)	Non Detected
pl-3-146-H03-E			Yes	0%	1) Plaster 2) 3)	Non Detected
pl-3-146-H03-F			Yes	0%	1) Plaster 2) 3)	Non Detected
pl-3-146-H03-G			Yes	0%	1) Plaster 2) 3)	Non Detected

Section 4 Material Information Tables

Site Information

CANG Vehicle Maintenance Transportation Building (Site ID: _____)

Inspection Date

Wednesday, August 1, 2001

Material Description Wall - Board			Material Number WLBO-4	Asbestos Present? No
Material Category Walls	Friable Classification Non-Friable	EPA Category Category II	Total Quantity 7,900	Unit of Measure Square Feet
General Condition	Damage Category	Overall Material Assessment No Assessment, Non-asbestos	Recommended Response	

General Material Comments

Material Location(s)

WEST

Sample ID(s)	Sample Location(s)	Floor	Analyzed	Overall Result	Layer(s) Reported by Lab	Results by Layer
WLBO-4-146-H04-A			Yes	0%	1) Drywall 2) 3)	Non Detected
WLBO-4-146-H04-B			Yes	0%	1) Drywall 2) 3)	Non Detected
WLBO-4-146-H04-C			Yes	0%	1) Drywall 2) 3)	Non Detected
WLBO-4-146-H04-D			Yes	0%	1) Drywall 2) 3)	Non Detected
WLBO-4-146-H04-E			Yes	0%	1) Drywall 2) 3)	Non Detected
WLBO-4-146-H04-F			Yes	0%	1) Drywall 2) 3)	Non Detected
WLBO-4-146-H04-G			Yes	0%	1) Drywall 2) 3)	Non Detected

Section 4 Material Information Tables

Site Information

CANG Vehicle Maintenance Transportation Building (Site ID:

Inspection Date

Wednesday, August 1, 2001

Material Description 12" White Ceiling Tile			Material Number CT-5	Asbestos Present? No
Material Category Ceilings	Friable Classification Friable	EPA Category Friable	Total Quantity 600	Unit of Measure Square Feet
General Condition	Damage Category	Overall Material Assessment No Assessment, Non-asbestos	Recommended Response	
General Material Comments				

Material Location(s)
SOUTHWEST

Sample ID(s)	Sample Location(s)	Floor	Analyzed	Overall Result	Layer(s) Reported by Lab	Results by Layer
ct-5-146-H05-A			Yes	0%	1) Ceiling Tile 2) 3)	Non Detected
ct-5-146-H05-B			Yes	0%	1) Ceiling Tile 2) 3)	Non Detected
ct-5-146-H05-C			Yes	0%	1) Ceiling Tile 2) 3)	Non Detected

Material Description 12" Tan Floor Tile			Material Number FT-6	Asbestos Present? No
Material Category Flooring	Friable Classification Non-Friable	EPA Category Category I	Total Quantity 600	Unit of Measure Square Feet
General Condition	Damage Category	Overall Material Assessment No Assessment, Non-asbestos	Recommended Response	
General Material Comments				

Material Location(s)
SOUTHWEST

Sample ID(s)	Sample Location(s)	Floor	Analyzed	Overall Result	Layer(s) Reported by Lab	Results by Layer
ft-6-01-5061-146-1	Room 112		Yes	0%	1) Floor Tile 2) 3)	Non Detected
ft-6-01-5062-146-2	Room 112		Yes	0%	1) Floor Tile 2) 3)	Non Detected
ft-6-01-5063-146-3	Room 111		Yes	0%	1) Floor Tile 2) 3)	Non Detected

Section 4 Material Information Tables

Site Information

CANG Vehicle Maintenance Transportation Building (Site ID: _____)

Inspection Date

Wednesday, August 1, 2001

Material Description Coving Mastic			Material Number MASTIC-7	Asbestos Present? No
Material Category Miscellaneous	Friable Classification Non-Friable	EPA Category Category II	Total Quantity 500	Unit of Measure Square Feet
General Condition	Damage Category	Overall Material Assessment No Assessment, Non-asbestos	Recommended Response	

General Material Comments

Material Location(s)

NORTHWEST AND SOUTH

Sample ID(s)	Sample Location(s)	Floor	Analyzed	Overall Result	Layer(s) Reported by Lab	Results by Layer
MASTIC-7-01-5064-146-4	Room 111		Yes	0%	1) Base Cove mastic 2) 3)	Non Detected
MASTIC-7-01-5065-146-5	Room 118		Yes	0%	1) Base Cove mastic 2) 3)	Non Detected
MASTIC-7-01-5066-146-6	Room 131		Yes	0%	1) Base Cove mastic 2) 3)	Non Detected

Material Description 2' x 4' Grooved Ceiling Tile			Material Number CT-8	Asbestos Present? No
Material Category Ceilings	Friable Classification Friable	EPA Category Friable	Total Quantity 500	Unit of Measure Square Feet
General Condition	Damage Category	Overall Material Assessment No Assessment, Non-asbestos	Recommended Response	

General Material Comments

Material Location(s)

SOUTHWEST

Sample ID(s)	Sample Location(s)	Floor	Analyzed	Overall Result	Layer(s) Reported by Lab	Results by Layer
ct-8-146-H08-A			Yes	0%	1) Ceiling Tile 2) 3)	Non Detected
ct-8-146-H08-B			Yes	0%	1) Ceiling Tile 2) 3)	Non Detected
ct-8-146-H08-C			Yes	0%	1) Ceiling Tile 2) 3)	Non Detected

Section 4 Material Information Tables

Site Information

CANG Vehicle Maintenance Transportation Building (Site ID: _____)

Inspection Date

Wednesday, August 1, 2001

Material Description Fire Door			Material Number FD-9	Asbestos Present? Yes (assumed)
Material Category Miscellaneous	Friable Classification Non-Friable	EPA Category Category II	Total Quantity 400	Unit of Measure Square Feet
General Condition	Damage Category	Overall Material Assessment Not Assessed under AHERA	Recommended Response Abate Prior to Demolition	

General Material Comments

Material Location(s)

NORTH AND SOUTHWEST

Sample ID(s)	Sample Location(s)	Floor	Analyzed	Overall Result	Layer(s) Reported by Lab	Results by Layer
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Material Description 1" TSI Pipe Insulation			Material Number PI-10	Asbestos Present? Yes
Material Category TSI	Friable Classification Friable	EPA Category Friable	Total Quantity 680	Unit of Measure Linear Feet
General Condition	Damage Category	Overall Material Assessment	Recommended Response Abate Prior to Demolition	

General Material Comments

Material Location(s)

SOUTHEAST

Sample ID(s)	Sample Location(s)	Floor	Analyzed	Overall Result	Layer(s) Reported by Lab	Results by Layer
pi-10-146-H10-A			Yes	20%	1) Pipe Insulation 2) 3)	10-20 % Amosite
pi-10-146-H10-B			No	Not Avail.	1) Pipe Insulation 2) 3)	
pi-10-146-H10-C			No	Not Avail.	1) Pipe Insulation 2) 3)	

Section 4 Material Information Tables

Site Information

CANG Vehicle Maintenance Transportation Building (Site ID: _____)

Inspection Date

Wednesday, August 1, 2001

Material Description 1" TSI Pipe Elbows			Material Number PE-11	Asbestos Present? Yes
Material Category TSI	Friable Classification Friable	EPA Category Friable	Total Quantity 28	Unit of Measure Linear Feet
General Condition	Damage Category	Overall Material Assessment	Recommended Response Abate Prior to Demolition	

General Material Comments

Material Location(s)

SOUTHEAST

Sample ID(s)	Sample Location(s)	Floor	Analyzed	Overall Result	Layer(s) Reported by Lab	Results by Layer
pe-11-146-H11-A			Yes	10%	1) TSI Elbow 2) TSI Elbow 3)	5-10 % Amosite 5-10 % Chrysotile
pe-11-146-H11-B			No	Not Avail.	1) TSI Elbow 2) 3)	
pe-11-146-H11-C			No	Not Avail.	1) TSI Elbow 2) 3)	

Material Description Textured Wall - Board #1			Material Number WLBO-12	Asbestos Present? No
Material Category Walls	Friable Classification Non-Friable	EPA Category Category II	Total Quantity 6,500	Unit of Measure Square Feet
General Condition	Damage Category	Overall Material Assessment No Assessment, Non-asbestos	Recommended Response	

General Material Comments

Material Location(s)

SOUTHEAST

Sample ID(s)	Sample Location(s)	Floor	Analyzed	Overall Result	Layer(s) Reported by Lab	Results by Layer
WLBO-12-146-H12-A			Yes	0%	1) Drywall 2) 3)	Non Detected
WLBO-12-146-H12-B			Yes	0%	1) Drywall 2) 3)	Non Detected
WLBO-12-146-H12-C			Yes	0%	1) Drywall 2) 3)	Non Detected
WLBO-12-146-H12-D			Yes	0%	1) Drywall 2) 3)	Non Detected
WLBO-12-146-H12-E			Yes	BLD	1) 2) 3)	

Section 4 Material Information Tables

Site Information

CANG Vehicle Maintenance Transportation Building (Site ID: _____)

Inspection Date

Wednesday, August 1, 2001

Material Description 2' x 4' Pinhole Ceiling Tile			Material Number CT-13	Asbestos Present? No
Material Category Ceilings	Friable Classification Friable	EPA Category Friable	Total Quantity 2,850	Unit of Measure Square Feet
General Condition	Damage Category	Overall Material Assessment No Assessment, Non-asbestos	Recommended Response	

General Material Comments

Material Location(s)

SOUTHEAST

Sample ID(s)	Sample Location(s)	Floor	Analyzed	Overall Result	Layer(s) Reported by Lab	Results by Layer
ct-13-146-H13-A			Yes	0%	1) Ceiling Tile 2) 3)	Non Detected
ct-13-146-H13-B			Yes	0%	1) Ceiling Tile 2) 3)	Non Detected
ct-13-146-H13-C			Yes	0%	1) Ceiling Tile 2) 3)	Non Detected
ct-13-146-H13-D			Yes	0%	1) Ceiling Tile 2) 3)	Non Detected
ct-13-146-H13-E			Yes	0%	1) Ceiling Tile 2) 3)	Non Detected

Section 4 Material Information Tables

Site Information

CANG Vehicle Maintenance Transportation Building (Site ID: _____)

Inspection Date

Wednesday, August 1, 2001

Material Description Wall - Plaster			Material Number WLPL-15	Asbestos Present? No
Material Category Walls	Friable Classification Non-Friable	EPA Category Category II	Total Quantity 2,300	Unit of Measure Square Feet
General Condition	Damage Category	Overall Material Assessment No Assessment, Non-asbestos	Recommended Response	

General Material Comments

Material Location(s)

SOUTHEAST

Sample ID(s)	Sample Location(s)	Floor	Analyzed	Overall Result	Layer(s) Reported by Lab	Results by Layer
WLPL-15-146-H15-A			Yes	0%	1) Wall Plaster 2) 3)	Non Detected
WLPL-15-146-H15-B			Yes	0%	1) Wall Plaster 2) 3)	Non Detected
WLPL-15-146-H15-C			Yes	0%	1) Wall Plaster 2) 3)	Non Detected
WLPL-15-01-5067-146-7	Room 129		Yes	0%	1) Wall Plaster 2) 3)	Non Detected
WLPL-15-01-5068-146-8	Room 129		Yes	0%	1) Wall Plaster 2) 3)	Non Detected

Material Description Textured Wall - Board #2			Material Number WLBO-17	Asbestos Present? No
Material Category Walls	Friable Classification Non-Friable	EPA Category Category II	Total Quantity 800	Unit of Measure Square Feet
General Condition	Damage Category	Overall Material Assessment No Assessment, Non-asbestos	Recommended Response	

General Material Comments

Material Location(s)

SOUTHEAST

Sample ID(s)	Sample Location(s)	Floor	Analyzed	Overall Result	Layer(s) Reported by Lab	Results by Layer
WLBO-17-146-H17-A			Yes	0%	1) Drywall 2) 3)	Non Detected
WLBO-17-146-H17-B			Yes	0%	1) Drywall 2) 3)	Non Detected
WLBO-17-146-H17-C			Yes	0%	1) Drywall 2) 3)	Non Detected

Section 4 Material Information Tables

Site Information

CANG Vehicle Maintenance Transportation Building (Site ID: _____)

Inspection Date

Wednesday, August 1, 2001

Material Description Transite, Interior Panelling			Material Number 311-18	Asbestos Present? Yes (assumed)
Material Category	Friable Classification Non-Friable	EPA Category Category II	Total Quantity 320	Unit of Measure Square Feet
General Condition	Damage Category	Overall Material Assessment Not Assessed under AHERA	Recommended Response Abate Prior to Demolition	
General Material Comments				
Material Location(s) SOUTHEAST				

Sample ID(s)	Sample Location(s)	Floor	Analyzed	Overall Result	Layer(s) Reported by Lab	Results by Layer
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Material Description 2" TSI Pipe Insulation			Material Number PI-19	Asbestos Present? Yes
Material Category TSI	Friable Classification Friable	EPA Category Friable	Total Quantity 70	Unit of Measure Linear Feet
General Condition	Damage Category	Overall Material Assessment	Recommended Response Abate Prior to Demolition	
General Material Comments				
Material Location(s) SOUTHEAST				

Sample ID(s)	Sample Location(s)	Floor	Analyzed	Overall Result	Layer(s) Reported by Lab	Results by Layer
pi-19-146-H19-A			Yes	20%	1) Pipe Insulation 2) Pipe Insulation 3)	10-20 % Amosite 5-10 % Chrysotile
pi-19-146-H19-B			No	Not Avail.	1) Pipe Insulation 2) 3)	
pi-19-146-H19-C			No	Not Avail.	1) Pipe Insulation 2) 3)	

Section 4 Material Information Tables

Site Information

CANG Vehicle Maintenance Transportation Building (Site ID:

Inspection Date

Wednesday, August 1, 2001

Material Description 2" TSI Pipe Elbows			Material Number PE-20	Asbestos Present? Yes
Material Category TSI	Friable Classification Friable	EPA Category Friable	Total Quantity 10	Unit of Measure Linear Feet
General Condition	Damage Category	Overall Material Assessment	Recommended Response Abate Prior to Demolition	

General Material Comments

Material Location(s)

SOUTHEAST

Sample ID(s)	Sample Location(s)	Floor	Analyzed	Overall Result	Layer(s) Reported by Lab	Results by Layer
pe-20-146-H20-A			Yes	20%	1) TSI Elbow 2) TSI Elbow 3)	10-20 % Amosite 5-10 % Chrysotile
pe-20-146-H20-B			No	Not Avail.	1) TSI Elbow 2) 3)	
pe-20-146-H20-C			No	Not Avail.	1) TSI Elbow 2) 3)	

Material Description Tank Cover TSI Miscellaneous			Material Number MI-21	Asbestos Present? Yes
Material Category Miscellaneous	Friable Classification Non-Friable	EPA Category Needs Determination	Total Quantity 150	Unit of Measure Square Feet
General Condition	Damage Category	Overall Material Assessment Not Assessed under AHERA	Recommended Response Abate Prior to Demolition	

General Material Comments

Material Location(s)

SOUTHEAST

Sample ID(s)	Sample Location(s)	Floor	Analyzed	Overall Result	Layer(s) Reported by Lab	Results by Layer
mi-21-146-H21-A			Yes	40%	1) Tank Insulation 2) 3)	30-40 % Chrysotile
mi-21-146-H21-B			No	Not Avail.	1) Tank Insulation 2) 3)	
mi-21-146-H21-C			No	Not Avail.	1) Tank Insulation 2) 3)	

Section 4 Material Information Tables

Site Information

CANG Vehicle Maintenance Transportation Building (Site ID: _____)

Inspection Date

Wednesday, August 1, 2001

Material Description 12" Transite Pipe			Material Number TE-22	Asbestos Present? Yes (assumed)
Material Category Miscellaneous	Friable Classification Non-Friable	EPA Category Category II	Total Quantity 10	Unit of Measure Linear Feet
General Condition	Damage Category	Overall Material Assessment Not Assessed under AHERA	Recommended Response Abate Prior to Demolition	

General Material Comments

Material Location(s)

SOUTHEAST

Sample ID(s)	Sample Location(s)	Floor	Analyzed	Overall Result	Layer(s) Reported by Lab	Results by Layer
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Material Description Hvac Vibration Cloth			Material Number VC-23	Asbestos Present? Yes
Material Category TSI	Friable Classification Non-Friable	EPA Category Friable	Total Quantity 20	Unit of Measure Square Feet
General Condition	Damage Category	Overall Material Assessment Not Assessed under AHERA	Recommended Response Abate Prior to Demolition	

General Material Comments

Material Location(s)

WEST

Sample ID(s)	Sample Location(s)	Floor	Analyzed	Overall Result	Layer(s) Reported by Lab	Results by Layer
vc-23-146-H23-A			Yes	80%	1) Vibration Cloth 2) 3)	60-80 %
vc-23-146-H23-B			No	Not Avail.	1) Vibration Cloth 2) 3)	
vc-23-146-H23-C			No	Not Avail.	1) Vibration Cloth 2) 3)	

Section 4 Material Information Tables

Site Information

CANG Vehicle Maintenance Transportation Building (Site ID: _____)

Inspection Date

Wednesday, August 1, 2001

Material Description 24" Transite Pipe			Material Number TE-24	Asbestos Present? Yes (assumed)
Material Category Miscellaneous	Friable Classification Non-Friable	EPA Category Category II	Total Quantity 10	Unit of Measure Linear Feet
General Condition	Damage Category	Overall Material Assessment Not Assessed under AHERA	Recommended Response Abate Prior to Demolition	
General Material Comments				
Material Location(s) WEST				

Sample ID(s)	Sample Location(s)	Floor	Analyzed	Overall Result	Layer(s) Reported by Lab	Results by Layer
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Material Description 6" Transite Pipe			Material Number TE-25	Asbestos Present? Yes (assumed)
Material Category Miscellaneous	Friable Classification Non-Friable	EPA Category Category II	Total Quantity 10	Unit of Measure Linear Feet
General Condition	Damage Category	Overall Material Assessment Not Assessed under AHERA	Recommended Response Abate Prior to Demolition	
General Material Comments				
Material Location(s) WEST				

Sample ID(s)	Sample Location(s)	Floor	Analyzed	Overall Result	Layer(s) Reported by Lab	Results by Layer
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Section 4 Material Information Tables

Site Information

CANG Vehicle Maintenance Transportation Building (Site ID: _____)

Inspection Date

Wednesday, August 1, 2001

Material Description Floor Tile Mastic			Material Number MASTIC-26	Asbestos Present? Yes
Material Category Miscellaneous	Friable Classification Non-Friable	EPA Category Category II	Total Quantity 3,050	Unit of Measure Square Feet
General Condition	Damage Category	Overall Material Assessment Not Assessed under AHERA	Recommended Response Abate Prior to Demolition	

General Material Comments

Material Location(s)

SOUTHWEST AND SOUTHEAST

Sample ID(s)	Sample Location(s)	Floor	Analyzed	Overall Result	Layer(s) Reported by Lab	Results by Layer
MASTIC-26-01-5069-146-9	Room 112		Yes	4%	1) Mastic 2) 3)	4 % Chrysotile
MASTIC-26-01-5070-146-10	Room 112		Yes	5%	1) Mastic 2) 3)	5 % Chrysotile
MASTIC-26-01-5071-146-11	Room 111		Yes	5%	1) Mastic 2) 3)	5 % Chrysotile
MASTIC-26-01-5072-146-12	Room 118		Yes	0%	1) Mastic 2) 3)	Non Detected
MASTIC-26-01-5073-146-13	Room 126		Yes	0%	1) Mastic 2) 3)	Non Detected

Material Description Ceiling Tile Mastic			Material Number MASTIC-27	Asbestos Present? No
Material Category Miscellaneous	Friable Classification Non-Friable	EPA Category Category II	Total Quantity 300	Unit of Measure Square Feet
General Condition	Damage Category	Overall Material Assessment No Assessment, Non-asbestos	Recommended Response	

General Material Comments

Material Location(s)

SOUTHWEST

Sample ID(s)	Sample Location(s)	Floor	Analyzed	Overall Result	Layer(s) Reported by Lab	Results by Layer
MASTIC-27-01-5074-146-14	Room 108		Yes	0%	1) Mastic 2) 3)	Non Detected
MASTIC-27-01-5075-146-15	Room 108		Yes	0%	1) Mastic 2) 3)	Non Detected
MASTIC-27-01-5076-146-16	Room 109		Yes	0%	1) Mastic 2) 3)	Non Detected

Section 4 Material Information Tables

Site Information

CANG Vehicle Maintenance Transportation Building (Site ID:

Inspection Date

Wednesday, August 1, 2001

Material Description 12 x 12 Gray/White Floor Tile			Material Number FT-28	Asbestos Present? No
Material Category Flooring	Friable Classification Non-Friable	EPA Category Category I	Total Quantity	Unit of Measure Square Feet
General Condition	Damage Category	Overall Material Assessment No Assessment, Non-asbestos	Recommended Response	

General Material Comments

Material Location(s)

Sample ID(s)	Sample Location(s)	Floor	Analyzed	Overall Result	Layer(s) Reported by Lab	Results by Layer
ft-28-01-5082-146-22	Room 118		Yes	0%	1) Floor Tile 2) 3)	Non Detected
ft-28-5083-146-23	Room 126		Yes	0%	1) Floor Tile 2) 3)	Non Detected
ft-28-5084-146-24	Room 131 at Room 130		Yes	0%	1) Floor Tile 2) 3)	Non Detected

Material Description Leveling Compound			Material Number LC-29	Asbestos Present? No
Material Category Flooring	Friable Classification Non-Friable	EPA Category Needs Determination	Total Quantity	Unit of Measure Square Feet
General Condition	Damage Category	Overall Material Assessment No Assessment, Non-asbestos	Recommended Response	

General Material Comments

Material Location(s)

Sample ID(s)	Sample Location(s)	Floor	Analyzed	Overall Result	Layer(s) Reported by Lab	Results by Layer
lc-29-01-5085-146-25	Room 118 Below Floor Tile		Yes	0%	1) Leveling Compound 2) 3)	Non Detected
lc-29-01-5086-146-26	Room 126 Below Floor Tile		Yes	0%	1) Leveling Compound 2) 3)	Non Detected
lc-29-01-5087-146-27	Room 131 Below Floor Tile		Yes	0%	1) Leveling Compound 2) 3)	Non Detected

Section 5 Removal Cost Estimate Summary

These estimates are for budgeting purposes only and should not be used as a quote for removal of the materials. It is not our recommendation to remove these materials unless they are beyond repair, or planned demolition or renovation activities will disturb the materials. Estimates are based on recent pricing we have received from contractors performing similar work and may vary from actual prices obtained due to the actual scope of work, quantity of material removed, control measures specified and contractor work loads, etc.

Building CANG Vehicle Maintenance Transportation Building				QTY. Units Removal Costs (low to high)
HM	EPA Category	Suspect Material	Material Location	
1	Category I	Roofing Material	EXTERIOR	37,877 Square Feet \$37877 to \$75754
2	Category II	Transite Panel	EXTERIOR	21,420 Square Feet \$42840
9	Category II	Fire Door	NORTH AND SOUTHWEST	400 Square Feet \$60000
10	Friable	1" TSI Pipe Insulation	SOUTHEAST	680 Linear Feet \$10200 to \$13600
11	Friable	1" TSI Pipe Elbows	SOUTHEAST	28 Linear Feet \$560
18	Category II	Transite, Interior Panelling	SOUTHEAST	320 Square Feet \$3200
19	Friable	2" TSI Pipe Insulation	SOUTHEAST	70 Linear Feet \$1050 to \$1400

HM	Building EPA Category	Suspect Material	Material Location	QTY. Units Removal Costs (low to high)
20	Friable	2" TSI Pipe Elbows	SOUTHEAST	10 Linear Feet \$500
21	Needs Determination	Tank Cover TSI Miscellaneous	SOUTHEAST	150 Square Feet \$500
22	Category II	12" Transite Pipe	SOUTHEAST	10 Linear Feet \$1000
23	Friable	Hvac Vibration Cloth	WEST	20 Square Feet \$500
24	Category II	24" Transite Pipe	WEST	10 Linear Feet \$1000
25	Category II	6" Transite Pipe	WEST	10 Linear Feet \$1000
26	Category II	Floor Tile Mastic	SOUTHWEST AND SOUTHEAST	3,050 Square Feet \$3050 to \$6100
Total Removal Costs:			\$161,777	to \$206,454

Building	Floor	Sample #	Sample Location	Room	Material Sampled	%/Type
146	1	01-5061-146-1	Room 112	112	12" Tan Floor Tile	Non Detected
146	1	01-5062-146-2	Room 112	112	12" Tan Floor Tile	Non Detected
146	1	01-5063-146-3	Room 111	111	12" Tan Floor Tile	Non Detected
146	1	01-5064-146-4	Room 111	111	Coving Mastic	Non Detected
146	1	01-5065-146-5	Room 118	118	Coving Mastic	Non Detected
146	1	01-5066-146-6	Room 131	131	Coving Mastic	Non Detected
146	1	01-5067-146-7	Room 129	129	Wall - Plaster	Non Detected
146	1	01-5068-146-8	Room 129	129	Wall - Plaster	Non Detected
146	1	01-5069-146-9	Room 112	112	Floor Tile Mastic	Non Detected
146	1	01-5070-146-10	Room 112	112	Floor Tile Mastic	4% Chrysoitile
146	1	01-5071-146-11	Room 111	111	Floor Tile Mastic	5% Chrysoitile
146	1	01-5072-146-12	Room 118	118	Floor Tile Mastic	5% Chrysoitile
146	1	01-5073-146-13	Room 126	126	Floor Tile Mastic	Non Detected
146	1	01-5074-146-14	Room 108	108	Floor Tile Mastic	Non Detected
146	1	01-5075-146-15	Room 108	108	Ceiling Tile Mastic	Non Detected
146	1	01-5076-146-16	Room 109	109	Ceiling Tile Mastic	Non Detected
146	1	01-5077-146-17	Core - East	Roof	Ceiling Tile Mastic	Non Detected
146	1	01-5078-146-18	Core - West	Roof	Roofing Material	Non Detected
146	1	01-5079-146-19	Parch	Roof	Roofing Material	Non Detected
146	1	01-5080-146-20	Penetration - North	Roof	Roofing Material	Non Detected
146	1	01-5081-146-21	Penetration - South	Roof	Roofing Material	8% Chrysoitile
146	1	01-5082-146-22	Room 118	Roof	Roofing Material	8% Chrysoitile
146	1	01-5083-146-23	Room 126	118	12 x 12 Gray/White Floor Tile	Non Detected
146	1	01-5084-146-24	Room 131 at Room 130	126	12 x 12 Gray/White Floor Tile	Non Detected
146	1	01-5085-146-25	Room 118 Below Floor Tile	131	12 x 12 Gray/White Floor Tile	Non Detected
146	1	01-5086-146-26	Room 126 Below Floor Tile	118	Leveling Compound	Non Detected
146	1	01-5087-146-27	Room 131 Below Floor Tile	126	Leveling Compound	Non Detected
146	1	146-H03-A	Ceiling	131	Leveling Compound	Non Detected
146	1	146-H03-B	Ceiling	103	Plaster	Pre-Existing Survey
146	1	146-H03-C	Ceiling	103	Plaster	Non Detected
146	1	146-H03-D	Ceiling	103	Plaster	Non Detected
146	1	146-H03-E	Ceiling	114	Plaster	Non Detected
146	1	146-H03-F	Ceiling	114	Plaster	Non Detected
146	1	146-H03-G	Ceiling	114	Plaster	Non Detected
146	1	146-H04-A	Wall	114	Plaster	Non Detected
146	1			104	Wall - Board	Non Detected

Building	Floor	Sample #	Sample Location	Room	Material Sampled	%/Type
146	1	146-H04-B	Wall	101	Wall - Board	Non Detected
146	1	146-H04-C	Wall	101	Wall - Board	Non Detected
146	1	146-H04-D	Wall	110	Wall - Board	Non Detected
146	1	146-H04-E	Wall	110	Wall - Board	Non Detected
146	1	146-H04-F	Wall	109	Wall - Board	Non Detected
146	1	146-H04-G	Wall	109	Wall - Board	Non Detected
146	1	146-H05-A	Ceiling	108	12" White Ceiling Tile	Non Detected
146	1	146-H05-B	Ceiling	108	12" White Ceiling Tile	Non Detected
146	1	146-H05-C	Ceiling	108	12" White Ceiling Tile	Non Detected
146	1	146-H08-A	Ceiling	113	2' x 4' Grooved Ceiling Tile	Non Detected
146	1	146-H08-B	Ceiling	112	2' x 4' Grooved Ceiling Tile	Non Detected
146	1	146-H08-C	Ceiling	112	2' x 4' Grooved Ceiling Tile	Non Detected
146	1	146-H10-A	Pipe run	130	1" TSI Pipe Insulation	10-20% Amosite
146	1	146-H10-B	Pipe run	130	1" TSI Pipe Insulation	Not Analyzed
146	1	146-H10-C	Pipe run	129	1" TSI Pipe Insulation	Not Analyzed
146	1	146-H11-A	Pipe elbow	130	1" TSI Pipe Elbows	10-20% Amosite
146	1	146-H11-B	Pipe elbow	130	1" TSI Pipe Elbows	Not Analyzed
146	1	146-H11-C	Pipe elbow	133	1" TSI Pipe Elbows	Not Analyzed
146	1	146-H12-A	Wall	118	Textured Wall - Board #1	Non Detected
146	1	146-H12-B	Wall	120	Textured Wall - Board #1	Non Detected
146	1	146-H12-C	Wall	120	Textured Wall - Board #1	Non Detected
146	1	146-H12-D	Wall	131	Textured Wall - Board #1	Non Detected
146	1	146-H12-E	Wall	131	Textured Wall - Board #1	Not Analyzed
146	1	146-H13-A	Ceiling	133	2' x 4' Pinhole Ceiling Tile	Non Detected
146	1	146-H13-B	Ceiling	131	2' x 4' Pinhole Ceiling Tile	Non Detected
146	1	146-H13-C	Ceiling	129	2' x 4' Pinhole Ceiling Tile	Non Detected
146	1	146-H13-D	Ceiling	128	2' x 4' Pinhole Ceiling Tile	Non Detected
146	1	146-H13-E	Ceiling	124	2' x 4' Pinhole Ceiling Tile	Non Detected
146	1	146-H15-A	Wall	128	Wall - Plaster	Non Detected
146	1	146-H15-B	Wall	125	Wall - Plaster	Non Detected
146	1	146-H15-C	Wall	123	Wall - Plaster	Non Detected
146	1	146-H17-A	Wall	122	Textured Wall - Board #2	Non Detected
146	1	146-H17-B	Wall	124	Textured Wall - Board #2	Non Detected
146	1	146-H17-C	Wall	125	Textured Wall - Board #2	Non Detected
146	1	146-H19-A	Pipe run	133	2" TSI Pipe Insulation	10-20% Amosite
146	1	146-H19-B	Pipe run	133	2" TSI Pipe Insulation	Not Analyzed

Building	Floor	Sample #	Sample Location	Room	Material Sampled	%/Type
146	1	146-H19-C	Pipe run	133	2" TSI Pipe Insulation	Not Analyzed
146	1	146-H20-A	Pipe elbow	118	2" TSI Pipe Elbows	10-20% Amosite
146	1	146-H20-B	Pipe elbow	118	2" TSI Pipe Elbows	Not Analyzed
146	1	146-H20-C	Pipe elbow	118	2" TSI Pipe Elbows	Not Analyzed
146	1	146-H21-A	Tank	122	Tank Cover TSI Miscellaneous	30-40% Chrysotile
146	1	146-H21-B	Tank	122	Tank Cover TSI Miscellaneous	Not Analyzed
146	1	146-H21-C	Tank	122	Tank Cover TSI Miscellaneous	Not Analyzed
146	1	146-H23-A	HVAC	101	Hvac Vibration Cloth	60-80% Chrysotile
146	1	146-H23-B	HVAC	101	Hvac Vibration Cloth	Not Analyzed
146	1	146-H23-C	HVAC	101	Hvac Vibration Cloth	Not Analyzed

Appendix A
Definitions of Terms and Assessment Criteria

Definitions of Terms and Assessment Criteria

This survey report organizes information on each suspect ACBM identified in tables located in Section 4. This section describes how to interpret the data found on materials listed in Section 4.

Material description contains the description of the suspect homogeneous asbestos containing building material.

Material Serial Number is used to reference the material for reinspections, etc..

Asbestos type and content describes the type of asbestos and its percentage in the material.

Asbestos Results for positive materials are shown as a percentage. Samples having less than 1% asbestos are reported as containing "Trace" amounts of asbestos and samples with no detected asbestos are reported as "BLD" or below limit of detection.

Sample number(s) identifies a particular material sample obtained from a specific sample location. Sample numbers are used primarily for laboratory identification.

Sample Location identifies where the samples of this material were obtained.

Material Category categorizes each material as surfacing, TSI or miscellaneous.

Surfacing Materials - Asbestos containing materials that are sprayed-on, trowled-on or otherwise applied to surfaces, such as acoustical plaster on ceilings and fireproofing on structural members, or other materials on surfaces for acoustical, fireproofing, or other purposes.

Thermal Systems Insulation (TSI) - Asbestos containing materials applied to pipes, fittings, boilers, breaching, tanks, ducts or other interior structural components to prevent heat loss or gain or water condensation.

Miscellaneous Materials - Asbestos containing materials applied to or a part of building components that are not classified as surfacing materials or thermal systems insulation.

Quantity & Units reports approximate total quantity per unit of measure for each material.

Building(s) & Floor(s) specifies where a material is located.

Material Location describes where the material is found throughout the building.

Material Condition identifies the material as Friable, Non-friable or Jacketed (for thermal systems insulation only) if asbestos is present.

Friable - An asbestos containing material that can be crumbled, pulverized or reduced to powder, when dry, by hand pressure, such as spray applied fireproofing on structural steel members, spray applied acoustical ceiling materials or damaged thermal systems insulation. Friable materials are of greatest concern due to their potential fiber release.

Non-Friable - An asbestos containing material where the asbestos is bound tightly in a matrix or sealed by a protective layer. Non-friable materials can become friable by being rendered to a crumbled, pulverized or powdered state, when dry, by crushing, sanding, sawing, shot-blasting, severe weathering or by other mechanically induced means. Common examples of non-friable materials are adhesives, floor tiles, transite and roofing materials.

Jacketed - An asbestos containing material applied to thermal systems insulation and "jacketed" with a protective outer layer such as canvas or metal to keep the material in good condition. Undamaged jacketed ACBM is considered non-friable. If the jacketing is damaged, the material is considered friable.

Damage Category describes the type of damage, if any, to the material. The following damage categories are used: None, Physical, Air, and Water.

Material Assessment identifies the condition of the material in relation to physical and water damage, delamination of the material from its substrate, the extent of the damage and the potential for damage from building conditions, such as, accessibility by building occupants, influence of vibration, etc. The six standard assessment categories ranked by hazard potential, with the first being the lowest hazard are as follows: 1) Potential for Damage, 2) Potential for Significant Damage, 3) Damaged, 4) Damaged with Potential for Damage, 5) Damaged with Potential for Significant Damage, and 6) Significantly Damaged. Only friable materials are assessed under AHERA regulations. Non-friable materials, unless damaged, are not assessed and can be assumed to be in good condition.

Damaged - The damage or deterioration of the material results in inadequate cohesion or adhesion with crumbling, blistering, water stains, marring or otherwise abraded over less than one-tenth (1/10) of the surface if the damage is evenly distributed or one-fourth (1/4) if the damage is localized.

Significant Damage - The damage or deterioration of the material results in inadequate adhesion or cohesion and the damage is extensive and severe with one or more of the following characteristics: 1) Crumbling or blistering over at least one-tenth (1/10) of the surface if evenly distributed, one-fourth (1/4) if the damage is localized; 2) Areas of the material hanging from the surface, delaminated, or showing adhesive failure; 3) Water stains, gouges or marred.

Recommended Response suggests the appropriate options for controlling or maintaining ACBM in a safe manner. There are four options used:

Operations & Maintenance (O&M) - A program designed to "manage" asbestos in-place. As long as asbestos containing materials remain in a building, an O&M program should be instituted to alert maintenance personnel, custodial workers and outside vendors of the existence and location of these materials and to set a policy for the maintenance of these materials. The material is usually only required to be removed if it is significantly damaged, prior to demolition of the building or if it will be disturbed by renovation activities.

Repair - The restoration of damaged or deteriorated asbestos containing building materials to an intact condition. Once the intact condition is established, the material should be included in an O&M program. The material is usually only required to be removed if it is significantly damaged, prior to demolition of the building or if it will be disturbed by renovation activities.

Abate Due to Condition - This material is significantly damaged and is unsafe in its current condition. The access to the area should be restricted to personnel equipped with appropriate personal protection. This material should be properly removed by a licensed contractor using workers trained in the safe removal of asbestos.

Abate Prior to Renovation - This material should be properly removed prior to planned renovation activities by a licensed contractor using workers trained in the safe removal of asbestos. This recommendation is usually made only on survey reports prepared prior to planned renovation activities.

Comments & Damage Description contains any additional information and or specific details of material damage are noted here.

EPA Category provides the appropriate material category as outlined in the NESHAPS regulation. The four options are friable, Category 1, Category 2, and needs determination.

Friable - Materials containing greater than 1% asbestos are always considered Regulated Asbestos Containing Materials (RACM) that require removal prior to building renovation or demolition activities that impact the material.

Category 1 - Materials that are bituminous non-friable and contain more than 1% asbestos that become RACM and require removal only when will be subject to grinding, cutting, sanding or abrading.

Appendix B
Bulk Sampling Protocol and Analytical Methods

Bulk Sampling Protocol and Analytical Methods

Bulk samples of suspect asbestos containing building materials were obtained using standard industrial hygiene techniques including wetting the material to minimize fiber release. Our personnel wore half-face air purifying respirators equipped with high efficiency particulate (HEPA) filters while obtaining samples

Our sampling strategy for suspect friable surfacing materials was based on the guidelines outlined in the EPA publication Asbestos in Buildings: Simplified Sampling Scheme for Friable Surfacing Materials, and the procedures outlined in 40 CFR 763, Subpart E (ASHERA). For non-friable suspect materials, ASHERA requires the building inspector to determine the appropriate number of samples to obtain and analyze. Usually one to three samples of non-friable materials are collected.

For each homogeneous material identified by visual inspection as suspect material, random samples are obtained. A single bulk sample is randomly selected from each homogeneous material for first-round testing. If the sample is positive, the remaining samples are not analyzed; if the sample is negative, the other samples are submitted for study. Every sample must be reported negative if the material is to be considered non-asbestos containing.

The bulk samples were delivered to an independent laboratory that participates in the bulk sample proficiency analysis program conducted by the United States Environmental Protection Agency and is accredited by the National Voluntary Laboratory Program (NVLAP). The samples were analyzed using Polarized Light Microscopy (PLM) with dispersion staining to estimate the percent of asbestos composition by volume. Samples with no observable asbestiform minerals are designated as None-Detected. Samples in which asbestiform minerals are observed, but exist in concentrations of less than one percent (<1%), are designated as present in Trace amounts; all other samples are designated as asbestos containing with the appropriate percent of asbestos noted.

Appendix C
Laboratory Bulk Sampling Reports

SCHNEIDER LABORATORIES

INCORPORATED

2512 W. Cary Street • Richmond, Virginia • 23220-5117
804-353-6778 • 800-785-LABS (5227) • (FAX) 804-353-6928

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AIHA/ELLAP 100527, NVLAP 1150, NYELAP 11413, CAELAP 2078, NC 593, SC 93003

LABORATORY ANALYSIS REPORT

Asbestos Identification by EPA Method 600/R-93/116

ACCOUNT: 2541-01-115
CLIENT: Benchmark
ADDRESS: 3732 Charter Park Drive
San Jose, CA 95136

DATE COLLECTED:
DATE RECEIVED: 8/31/2001
DATE ANALYZED: 9/ 4/2001
DATE REPORTED: 9/ 4/2001

PO NO.:
PROJECT NAME: NASA
PROJECT NO.: E01-448-A-SU
JOB LOCATION: Parcel Bldg 146

Client Sample No.	SLI Sample/ Layer ID	Sample Identification/ Layer Name	Asbestos Detected (Yes/No)	Sample Description
01-5061-146-1	2033857 Layer 1: 100% Non-Asbestos	Room 112 Floor Tile	No	Beige, Organically Bound CELLULOSE FIBER 4%, NON FIBROUS MATERIAL 96%
01-5062-146-2	2033858 Layer 1: 100% Non-Asbestos	Room 112 Floor Tile	No	Beige, Organically Bound CELLULOSE FIBER 4%, NON FIBROUS MATERIAL 96%
01-5063-146-3	2033859 Layer 1: 100% Non-Asbestos	Room 111 Floor Tile	No	Beige, Organically Bound CELLULOSE FIBER 4%, NON FIBROUS MATERIAL 96%
01-5064-146-4	2033860 Layer 1: 100% Non-Asbestos	Room 111 Mastic	No	Brown, Brittle NON FIBROUS MATERIAL 92%, WOLLASTONITE 8%
	Layer 2: 100% Non-Asbestos	Granular Material	No	White, Granular NON FIBROUS MATERIAL 100%
01-5065-146-5	2033861 Layer 1: 100% Non-Asbestos	Room 118 Mastic	No	Brown, Brittle NON FIBROUS MATERIAL 92%, WOLLASTONITE 8%

Samples analyzed by the EPA Test Method are subject to the inherent limitations of light microscopy including interference by matrix components. Gravimetric reduction and correlative analyses are recommended for all non-friable, organically bound materials. For calibrated visual estimate, 1% is the concentration at which there is a quantitative uncertainty. This report relates only to the items tested, must not be reproduced except in full with the approval of the lab, and must not be used to claim NVLAP or other government agency endorsement.

Client Sample No.	SLI Sample/ Layer ID	Sample Identification/ Layer Name	Asbestos Detected (Yes/No)	Sample Description
	Layer 2:	Granular Material	No	White, Granular
	100% Non-Asbestos	NON FIBROUS MATERIAL		100%
01-5066-146-6	2033862	Room 131		
	Layer 1:	Mastic	No	Yellow, Soft
	100% Non-Asbestos	CELLULOSE FIBER 1%, NON FIBROUS MATERIAL		99%
	Layer 2:	Granular Material	No	White, Granular
	100% Non-Asbestos	NON FIBROUS MATERIAL		100%
01-5067-146-7	2033863	Room 129		
	Layer 1:	Basecoat	No	Beige, Granular
	100% Non-Asbestos	CELLULOSE FIBER 1%, NON FIBROUS MATERIAL		99%
	Layer 2:	Plaster	No	White, Granular
	100% Non-Asbestos	NON FIBROUS MATERIAL		100%
01-5068-146-8	2033864	Room 129		
	Layer 1:	Plaster	No	White, Granular
	100% Non-Asbestos	CELLULOSE FIBER 1%, NON FIBROUS MATERIAL		99%
01-5069-146-9	2033865	Rm 112		
	Layer 1:	Mastic	Yes	Black, Soft
	4% Asbestos	CHRYSOTILE 4%		
	96% Non-Asbestos	NON FIBROUS MATERIAL		96%
01-5070-146-10	2033866	Rm 112		
	Layer 1:	Mastic	Yes	Black, Soft
	5% Asbestos	CHRYSOTILE 5%		
	95% Non-Asbestos	NON FIBROUS MATERIAL		95%
01-5071-146-11	2033867	Rm 111		
	Layer 1:	Mastic	Yes	Black, Soft
	5% Asbestos	CHRYSOTILE 5%		
	95% Non-Asbestos	NON FIBROUS MATERIAL		95%
01-5072-146-12	2033868	Rm 118		
	Layer 1:	Mastic	No	Yellow, Brittle
	100% Non-Asbestos	NON FIBROUS MATERIAL		100%
01-5073-146-13	2033869	Rm 126		
	Layer 1:	Mastic	No	Yellow, Brittle
	100% Non-Asbestos	NON FIBROUS MATERIAL		100%

Samples analyzed by the EPA Test Method are subject to the inherent limitations of light microscopy including interference by matrix components. Gravimetric reduction and correlative analyses are recommended for all non-friable, organically bound materials. For calibrated visual estimate, 1% is the concentration at which there is a quantitative uncertainty. This report relates only to the items tested, must not be reproduced except in full with the approval of the lab, and must not be used to claim NVLAP or other government agency endorsement.

Client Sample No.	SLI Sample/ Layer ID	Sample Identification/ Layer Name	Asbestos Detected (Yes/No)	Sample Description
01-5074-146-14	2033870	Room 108		
	Layer 1:	Ceiling Tile	No	Gray, Fibrous CELLULOSE FIBER 40%, FOAMED GLASS 10%, MINERAL/GLASS WOOL 30%, NON FIBROUS MATERIAL 20%
	100% Non-Asbestos			
	Layer 2:	Mastic	No	Brown, Brittle CELLULOSE FIBER < 1%, NON FIBROUS MATERIAL 92%, WOLLASTONITE 8%
	100% Non-Asbestos			
	Layer 3:	Drywall	No	White, Powdery CELLULOSE FIBER 10%, MINERAL/GLASS WOOL 2%, NON FIBROUS MATERIAL 88%
	100% Non-Asbestos			
	Layer 4:	Joint Compound	No	White, Granular CELLULOSE FIBER 2%, NON FIBROUS MATERIAL 98%
	100% Non-Asbestos			
01-5075-146-15	2033871	Room 108		
	Layer 1:	Ceiling Tile	No	Gray, Fibrous CELLULOSE FIBER 40%, FOAMED GLASS 10%, MINERAL/GLASS WOOL 30%, NON FIBROUS MATERIAL 20%
	100% Non-Asbestos			
	Layer 2:	Mastic	No	Brown, Brittle NON FIBROUS MATERIAL 92%, WOLLASTONITE 8%
	100% Non-Asbestos			
-5076-146-16	2033872	Room 109		
	Layer 1:	Ceiling Tile	No	Gray, Fibrous CELLULOSE FIBER 40%, FOAMED GLASS 10%, MINERAL/GLASS WOOL 30%, NON FIBROUS MATERIAL 20%
	100% Non-Asbestos			
	Layer 2:	Mastic	No	Brown, Brittle NON FIBROUS MATERIAL 92%, WOLLASTONITE 8%
	100% Non-Asbestos			
01-5077-146-17	2033873	Core-East		
	Layer 1:	Roofing	No	Black, Bituminous CELLULOSE FIBER 5%, MINERAL/GLASS WOOL 15%, NON FIBROUS MATERIAL 80%
	100% Non-Asbestos			
01-5078-146-18	2033874	Core-West		
	Layer 1:	Roofing	No	Black, Bituminous CELLULOSE FIBER 2%, MINERAL/GLASS WOOL 15%, NON FIBROUS MATERIAL 83%
	100% Non-Asbestos			

Samples analyzed by the EPA Test Method are subject to the inherent limitations of light microscopy including interference by matrix components. Gravimetric reduction and correlative analyses are recommended for all non-friable, organically bound materials. For calibrated visual estimate, 1% is the concentration at which there is a quantitative uncertainty. This report relates only to the items tested, must not be reproduced except in full with the approval of the lab, and must not be used to claim NVLAP or other government agency endorsement.

Client Sample No.	SLI Sample/ Layer ID	Sample Identification/ Layer Name	Asbestos Detected (Yes/No)	Sample Description
01-5079-146-19	2033875 Layer 1: 100% Non-Asbestos	Patch Patch	No	Black, Bituminous CELLULOSE FIBER 4%, NON FIBROUS MATERIAL 96%
01-5080-146-20	2033876 Layer 1: 8% Asbestos 92% Non-Asbestos	Penetration-North Penetration Mtrl.	Yes	Black, Bituminous CHRYBOTILE 8% MINERAL/GLASS WOOL 20%, NON FIBROUS MATERIAL 72%
01-5081-146-21	2033877 Layer 1: 8% Asbestos 92% Non-Asbestos	Penetration-South Penetration Mtrl.	Yes	Black, Bituminous CHRYBOTILE 8% MINERAL/GLASS WOOL 20%, NON FIBROUS MATERIAL 72%
01-5082-146-22	2033878 Layer 1: 100% Non-Asbestos	Room 118 Floor Tile	No	Gray, Organically Bound CELLULOSE FIBER 1%, NON FIBROUS MATERIAL 99%
01-5083-146-23	2033879 Layer 1: 100% Non-Asbestos	Room 126 Floor Tile	No	Gray, Organically Bound CELLULOSE FIBER 1%, NON FIBROUS MATERIAL 99%
1-5084-146-24	2033880 Layer 1: 100% Non-Asbestos	Room 131 @ Rm 130 Floor Tile	No	Gray, Organically Bound CELLULOSE FIBER 1%, NON FIBROUS MATERIAL 99%
01-5085-146-25	2033881 Layer 1: 100% Non-Asbestos	Below FT Rm 118 Leveling Cmpd.	No	White, Granular NON FIBROUS MATERIAL 100%
	Layer 2: 100% Non-Asbestos	Mastic	No	Yellow, Brittle NON FIBROUS MATERIAL 100%
01-5086-146-26	2033882 Layer 1: 100% Non-Asbestos	Below FT Rm 126 Leveling Cmpd.	No	White, Granular CELLULOSE FIBER 2%, NON FIBROUS MATERIAL 98%
	Layer 2: 100% Non-Asbestos	Mastic	No	Yellow, Brittle NON FIBROUS MATERIAL 100%
01-5087-146-27	2033883 Layer 1: 100% Non-Asbestos	Below FT Rm 131 Floor Tile	No	Gray, Organically Bound CELLULOSE FIBER 5%, NON FIBROUS MATERIAL 95%
		No Leveling Compound Found		

Samples analyzed by the EPA Test Method are subject to the inherent limitations of light microscopy including interference by matrix components. Gravimetric reduction and correlative analyses are recommended for all non-friable, organically bound materials. For calibrated visual estimate, 1% is the concentration at which there is a quantitative uncertainty. This report relates only to the items tested, must not be reproduced except in full with the approval of the lab, and must not be used to claim NVLAP or other government agency endorsement.

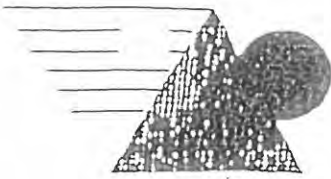
Client Sample No.	SLI Sample/ Layer ID	Sample Identification/ Layer Name	Asbestos Detected (Yes/No)	Sample Description
	Layer 2: 100% Non-Asbestos	Mastic NON FIBROUS MATERIAL	No	Yellow, Brittle 100%

ANALYST: LORI A. PEREZ

Total no. of pages in report = 5


 REVIEWED BY Jean L. Mayes, Analyst

Samples analyzed by the EPA Test Method are subject to the inherent limitations of light microscopy including interference by matrix components. Gravimetric reduction and correlative analyses are recommended for all non-friable, organically bound materials. For calibrated visual estimate, 1% is the concentration at which there is a quantitative uncertainty. This report relates only to the items tested, must not be reproduced except in full with the approval of the lab, and must not be used to claim NVLAP or other government agency endorsement.



BENCHMARK

Sample Location Worksheet
Chain Of Custody

3680 Charter Park Dr Suite E San Jose, CA 95136
(408) 448-7594 (408) 448-3849 (fax)

pg 1 of 3

Project Number: 01-448-A-SG Date: _____

Technician: _____

Project Location: Parcel 5, Bldg 146

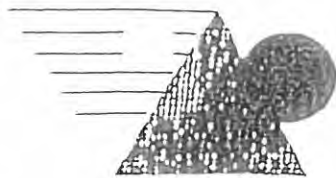
Client Name: Kris

Company: NASA

Project Type	Type Of Analysis	Turnaround Time
Asbestos	PLM/Bulk (EPA 600)	Same Day 3 Hr 6 Hr
Lead-based Paint	EPA SW846-7420, FLAA	24 Hour
Lead Risk Assessment	Dust Wipes, Paint Chips	48 Hour
Lead (water)	Air, Soil	72 Hour
Mold/Fungus/Bacteria	SM313B, GFAA, Water	5 Day
Indoor Air Quality	TEM/Bulk (Chatfield)	Other: _____
Other: _____	Other: _____	TTP = Test Till Positive

Homogenous Material Group	Material / Component	Sample Number	Location Of Samples	Analysis Specification
06	12 x 12 TAN FT.	01-5061-146-1	Room 112	
	↓	01-5062-146-2	Room 112	
	↓	01-5063-146-3	Room 111	
07	BASECOATING MASTIC	01-5064-146-4	Room 111	
	↓	01-5065-146-5	Room 118	
	↓	01-5066-146-6	Room 131	
14	9x9 BROWN FT	01-146-7	X	
	↓	01-146-8		
	↓	01-146-9		
15	PLASTER	01-5067-146-10	Room 129	
	↓	01-5068-146-11	Room 129	
16	BROWN RST	01-146-12	X	
	↓	01-146-13		
	↓	01-146-14		
20	FLOOR TILE MASTIC	01-5069-146-15	w/ sample #1	

Relinquished By: <u>T. Thompson</u>	Received By: <u>R. Thompson</u>	Date/Time Received: <u>8/3/01 9:30a</u>
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BENCHMARK

Sample Location Works:
Chain Of Cust

3680 Charter Park Dr Suite E San Jose, CA 95136
(408) 448-7594 (408) 448-3849 (fax)

pg 2 of 3

Project Number: _____ Date: _____ Technician: _____

Project Location: BUD 6 146

Client Name: _____ Company: _____

Project Type	Type Of Analysis	Turnaround Time
<u>Asbestos</u>	<u>PLM/Bulk (EPA 600)</u>	Same Day 3 Hr 6 Hr
Lead-based Paint	EPA SW846-7420, FLAA	<u>24 Hour</u>
Lead Risk Assessment	Dust Wipes, Paint Chips	48 Hour
Lead (water)	Air, Soil	72 Hour
Mold/Fungus/Bacteria	SM313B, GFAA, Water	5 Day
Indoor Air Quality	TEM/Bulk (Chatfield)	Other: _____
Other: _____	Other: _____	TTP = Test Till Positive

Homogenous Material Group	Material / Component	Sample Number	Location Of Samples	Analysis Specification
26	FLOR TILE MASTIC	01-5070-146- 10 ¹⁰	w/ SAMPLE #2	
		01-5071-146- 11 ¹¹	w/ SAMPLE #3	
		01-5072-146- 12 ¹²	w/ SAMPLE #22	
		01-5073-146- 13 ¹³	w/ SAMPLE #23	
27	CEILING TILE MASTIC	01-5074-146- 20 ¹⁴	Room 108	
		01-5075-146- 21 ¹⁵	Room 108	
		01-5076-146- 22 ¹⁶	Room 109	
01	ROOFING	01-5077-146- 23 ¹⁷	CORE - EAST	
		01-5078-146- 24 ¹⁸	CORE - WEST	
		01-5079-146- 25 ¹⁹	CORE Patch	
		01-5080-146- 26 ²⁰	Penetration - North	
		01-5081-146- 27 ²¹	Penetration - South	
28	12x12 GRAY/WHITE F.T	01-5082-146-28	Room 118	
		01-5083-146-29	Room 126	
		01-5084-146- 30 ²⁴	TILE ONLY Room 131, AT Room 130	

Relinquished By: <i>T. McFarlan</i>	Received By:	Date/Time Received:
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Appendix D
Summary of Regulatory Requirements

Appendix D Summary of Regulatory Requirements

This appendix provides a summary of building owner and manager requirements under various asbestos regulations promulgated by the Occupational Safety and Health Administration (OSHA) and the Environmental Protection Agency (EPA) to protect building occupants and employees from exposure to asbestos.

Survey Requirements

Prior to any renovation activity, OSHA and EPA regulations require that a complete asbestos survey be performed to determine if asbestos is present in any suspect asbestos containing material that will be present in the construction or work area. This survey report addresses accessible materials. It is recommended that prior to renovation activities, inaccessible areas that could contain asbestos materials be inspected.

Notification and Posting Requirements

Regulatory agencies feel that the building owner or manager should be responsible for knowing and communicating the locations of asbestos in their buildings to building employees, outside contractors and tenants to prevent exposure to asbestos.

Under the California Health and Safety Code, building owners and managers are required to provide annual notifications regarding known asbestos containing materials in their buildings to building employees, tenants, vendors and outside contractors. Therefore, specific information contained in this survey report is required to be included in the notification.

OSHA requires building employees, outside contractors, vendors and construction contractors bidding on or performing work in buildings be provided with notification regarding asbestos containing materials in their work areas. OSHA also requires that asbestos warning signs be posted in mechanical rooms.

Removal Requirements

Under EPA regulations, asbestos containing materials must be properly removed by licensed asbestos abatement contractors prior to renovation or demolition activities that would disturb friable materials or cause non-friable materials to become friable and a regulated material.

Repair of Damaged Materials and Cleanup of Debris

OSHA requires that asbestos containing debris be immediately cleaned up. It is recommended that damaged materials that may release fibers be repaired as soon as possible to prevent fiber release and potential exposures.

Training Requirements

OSHA requires employers whose employees are likely to or required to disturb asbestos to receive an asbestos training course. Refresher training is required to be provided annually.

Appendix E
AHERA Building Inspector Certifications

State of California
Division of Occupational Safety and Health

Certified Asbestos Consultant

Terri A. MacFarlane



Name

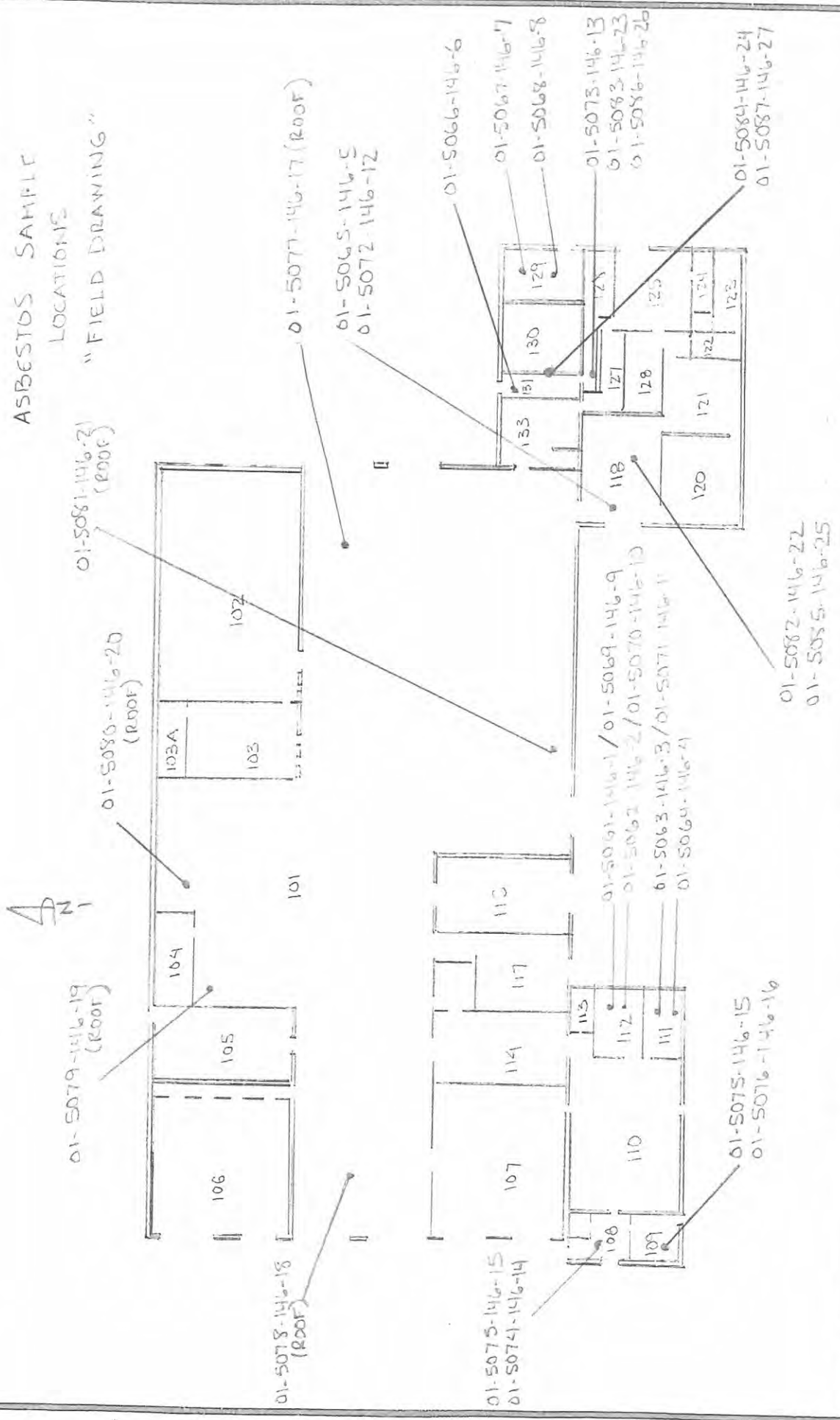
Certification No. 90-2747

Expires on 5/3/2002

This certification was issued by the Division of Occupational Safety and Health as authorized by Sections 7100 et seq. of the Business and Professions Code.

Appendix F
Drawings Indicating Sampling Locations

ASBESTOS SAMPLE
LOCATIONS
"FIELD DRAWING"



	Property Inspections - Environmental Engineering Specialized Training - Contract Management 3732 - A Charter Park Drive San Jose, CA 951366 Phone: (408) 448-7594 - Fax: (408) 448-3849		PROJECT NAME: Bldg 146 NASA AHCS PARCEL 5		DRAFT PERSON: WLB	DATE: 11/15	DWG. No. 1
	PROJECT No. E01-448-ALSU						