Limited Good Faith Inspection

Concourse B Roof Replacement Project (U00245)
Seattle-Tacoma International Airport
17801 International Blvd, Seattle, WA 98158

Executive Summary

A limited "good faith" inspection of the Concourse B roof was performed to support the Concourse B Roof Replacement Project (WP# U00245). The current inspection was performed by Port Construction Services (PCS). Results are summarized below.

Asbestos

Asbestos was not detected in any of the materials sampled or assessed during this inspection.

Introduction

The Concourse B Roof Replacement Project (U00245) will remove the existing roofing system on Concourse B, install a new elastomeric roofing system, refurbish existing Kalwall windows/skylights, replace delaminated Kalwall windows/skylights, and install fixed ladders and fall protection on the penthouses as needed.

A limited "good faith" inspection of the Concourse B roof was performed at the request of Adam Olson, Project Manager. The inspection was limited to the Concourse B roof, which will be impacted by the referenced Project, as described above.

This inspection was performed by the following Asbestos Hazard Emergency Response Act (AHERA) Building Inspector:

- Debra Reeves-Orth, Port Construction Services (PCS)
  Certification Number: 153271, Expiration: 10/06/16
  Email: reeves-orth.d@portseattle.org
  Desk: (206) 787-4074 / Cell: (206) 399-3994

Methods

Asbestos

This inspection was conducted in accordance with the requirements of Washington Administrative Code (WAC) 296-62-07721 and Puget Sound Clean Air Agency (PCSCAA) Regulation III, Article 4, Section 4.02. Suspect asbestos-containing materials were sampled in accordance with AHERA sampling guidelines (40 CFR 763.86) and analyzed by a National Voluntary Laboratory Accreditation Program (NVLAP) accredited laboratory using polarized light microscopy (PLM) by United States Environmental Protection Agency (EPA) Method 600.

Port of Seattle

Existing Documents

Roof construction and types of suspect asbestos-containing materials (ACM) associated with the Concourse B roof were verified in the field and then compared to existing documentation describing the composition and asbestos content of those materials. Data from the following documents were utilized for this inspection:

- Limited Good Faith Inspection, SWA Gate B15 & ATO Improvements (PCS 2015)
- Limited Good Faith Inspection, Interstitial Space on Concourses B, C & D (PCS 2014)
- Roof Index Plan (POS 2014)
- Safety Data Sheets and product information for PVC roofing systems (Sika, 2007-2015)

The current inspection was intended to supplement the existing data in these documents and meet the "good faith" inspection requirements of WAC 296-62-07721. The previous inspection document can be provided upon request.

Results

Asbestos sample results for the current "good faith" inspection are summarized below.

Table 1 – Asbestos Sample Results – Concourse B Roof

Sample Number	Material	Sample Location	Lab Result
B Roof- 01	Roof sealant	Concourse B roof, grid line 10-F	ND
B Roof-02	Roof sealant	Concourse B roof, grid line 10-G.6	ND
B Roof-03	Window sealant	Concourse B roof, skylights at end of concourse, grid line 42.5-G	ND
B Roof-04	Window sealant	Concourse B roof, skylights at end of concourse, grid line 43.5-E.5	ND
B Roof-05	Exhaust vent sealant	Concourse B roof, grid line 39-H	ND
B Roof-06	Roof sealant	Concourse B roof, grid line 30-F	ND
B Conc Roof 01	Layer 1: PVC roof membrane Layer 2: Rigid foam insulation Layer 3: Lightweight insulating concrete fill	Concourse B roof, grid line 5-F	Layer 1: ND Layer 2: ND Layer 3: ND
B Conc Roof 02	Layer 1: PVC roof membrane Layer 2: Lightweight insulating concrete fill	Concourse B roof, grid line 44-H	Layer 1: ND Layer 2: ND
B Conc Roof 03	Lightweight insulating concrete fill	Concourse B roof, grid line 39-H.2	ND
B Conc Roof 04	Layer 1: PVC roof membrane Layer 2: Lightweight insulating concrete fill	Concourse B roof, grid line 40-G	Layer 1: ND Layer 2: ND
B Conc Roof 05	Layer 1: PVC roof membrane Layer 2: Lightweight insulating concrete fill	Concourse B roof, grid line 31.5-D	Layer 1: ND Layer 2: ND
B Conc Roof 06	Lightweight insulating concrete fill	Concourse B roof, grid line 20.5-E	ND

Sample Number	Material	Sample Location	Lab Result
B Conc Roof 07	Lightweight insulating concrete fill	Concourse B roof, grid line 18-E	ND
B3PH-02	Gray spray-applied fireproofing	Concourse B, penthouse, west wall	ND
BH14-04	Gray spray-applied fireproofing (debris)	Concourse B, interstitial space, BH14	ND
BH9-06	Gray spray-applied fireproofing (debris)	Concourse B, interstitial space, BH9	ND
B-A01	Gray spray-applied fireproofing	Concourse B, Room B3263R	ND
B-A02	Gray spray-applied fireproofing	Concourse B, Room B3262R	ND
B-A03	Gray spray-applied fireproofing	Concourse B, Room B3246R	ND
B-A04	Gray spray-applied fireproofing	Concourse B, Room B3205R	ND
B-A05	Gray spray-applied fireproofing	Concourse B, outside Room B3220R	ND
B-A06	Gray spray-applied fireproofing	Concourse B, Room B3206R	ND
B-A07	Gray spray-applied fireproofing	Concourse B, outside Room B3203R	ND

Notes:
1. Bold type indicates positive lab results for asbestos, or material is presumed to contain asbestos.
2. ND - None detected

Review of the referenced documents, conversations with Port staff, and field observation indicated that the Concourse B roofing system is composed of the following layers:

Table 2 – Roof Layers – Concourse B Roof

Roof Layer	Material	Asbestos Content
1	45 mil Sika-Trocal® PVC membrane roofing (mechanically attached)	No asbestos*
2	Tapered rigid polyiso foam insulation (mechanically attached)	No asbestos*
3	Lightweight insulating fill	No asbestos**
4	22 gauge metal deck	---

Notes:
1. * See attached Safety Data Sheets and product information for Sika roofing products.
2. ** See sample results in Table 1 above.

The referenced lab results, Safety Data Sheets and product information document that asbestos is not present in the roofing system in place on Concourse B.

Recommendations

Asbestos

Asbestos-containing material (ACM) and presumed asbestos-containing material (PACM) that may be impacted by demolition/renovation activities must be removed by a licensed asbestos abatement contractor prior to disturbance. The asbestos work must be performed in compliance with Washington State worker protection and environmental protection regulations. See WAC 296-62, WAC 296-65, and Puget Sound Clean Air Agency Regulation III, Article 4 for additional information.

Limiting Conditions

This survey was limited to observation, minimal destructive sampling, and analysis of suspect building materials in accessible portions of the Concourse B roof. Common construction techniques render portions of any building inaccessible; as a result, additional asbestos-containing building materials may be present in inaccessible areas of the building that were not observed during the survey. Inaccessible areas should be presumed to contain asbestos until extensive destructive sampling is performed in those areas. In addition, any suspect materials that were not sampled during the referenced survey activities should be presumed to contain asbestos until otherwise indicated by sampling and analysis.

Limitations of the Assessment

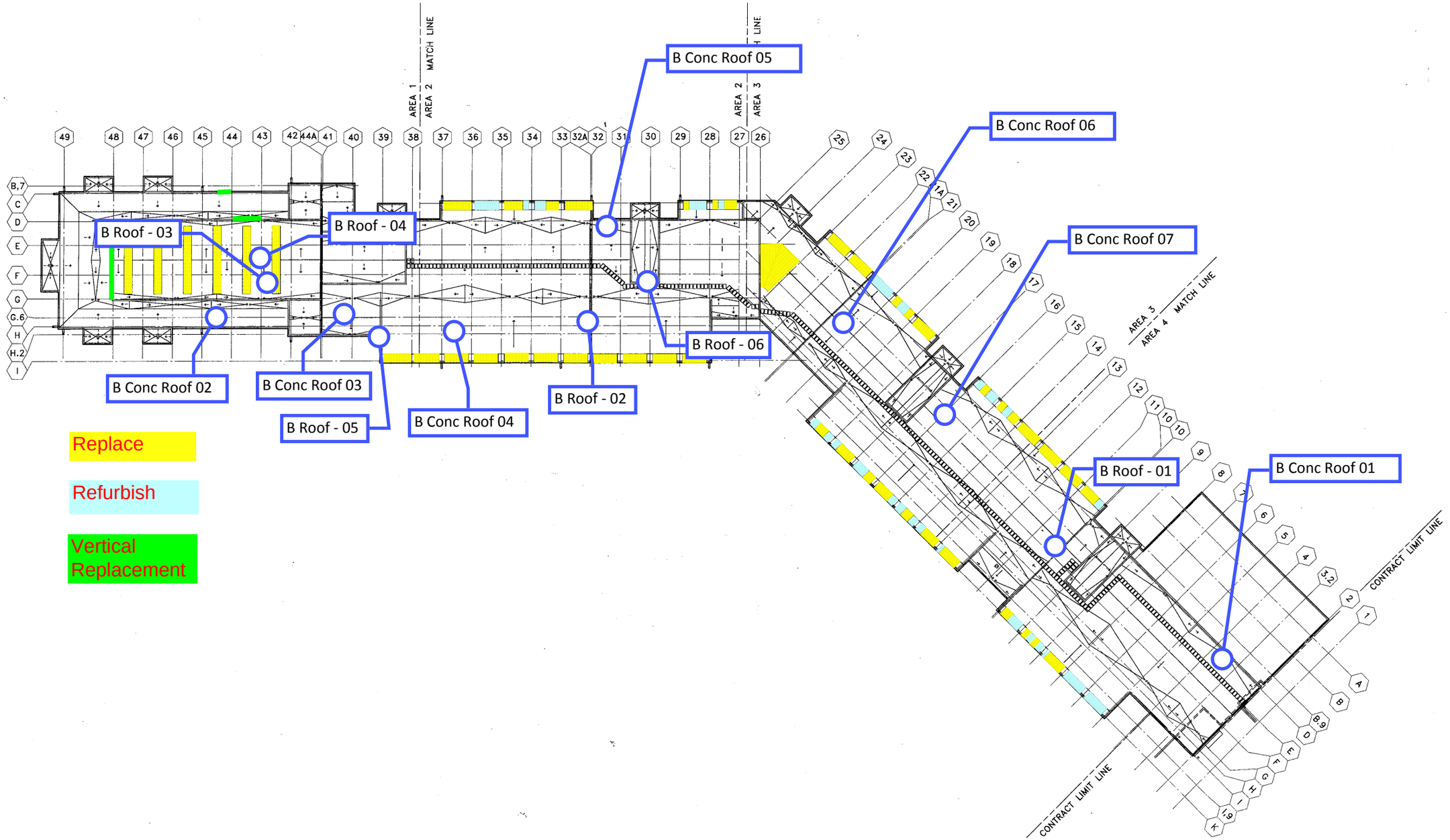
The conclusions of this report are based solely upon visual site observations and interpretations of laboratory analyses, as described in this report. The opinions presented herein apply to the site conditions existing at the time of the investigation and interpretation of current regulations pertaining to asbestos. Therefore, these opinions and recommendations may not apply to future conditions that may exist at the site which we have not had the opportunity to evaluate. All applicable state, federal, and local regulations should always be verified prior to any work that will disturb materials containing asbestos.

Attachments

Figure 1 – Sample Locations
Bulk Sample Analytical Reports
Roof Index Plan
Safety Data Sheets

Port of Seattle

Figures



Replace

Refurbish

Vertical Replacement

AS-BUILT

1/32" = 1' scale 20 0 20 40 60 80 feet

KEY PLAN

PLOT FILE: ROOFCOB
FILE NAME: ROOFCOB

Leo A Daly / The NBBJ Group Associated Architects

PROJECT ENGR./ARCH.	GP
DESIGNER:	RLZ
DRAWN BY:	T.W.Brown
SCALE:	1/32" = 1'-0"
DATE:	01/21/1991
CHECKED BY:	WRM

5543 REGISTERED ARCHITECT Gordon Phillips GORDON PHILLIPS STATE OF WASHINGTON

REVISIONS

NO.	DATE	BY	DESCRIPTION	APP'D	NO.	DATE	BY	DESCRIPTION	APP'D

AS BUILT AND APPROVED
BY GPE DATE: 12/29/95
THE DRAWING REPRESENTS A RECORD OF HOW THE PROJECT WAS CONSTRUCTED AND DOES NOT REPRESENT DESIGN OR CHANGE APPROVAL

PROJECT ENGINEER	GEORGE ENGLAND
DESIGNER:	
DRAWN BY:	
APPROVED BY:	
SCALE:	
DATE:	
CHECKED BY:	

PORT OF SEATTLE

SEA-TAC INTERNATIONAL AIRPORT

Concourse Improvements Project

ROOF LEVEL PLAN CONCOURSE B REF. ONLY

WORK ORDER NO.	C-2995
CONSULTANT'S NO.	B-A1.03
PORT OF SEATTLE NO.	STIA-9043-A13

Bulk Sample Analytical Reports

April 29, 2016

Debra Reeves-Orth
Port of Seattle - PCS
AOB 5th Floor Seattle-Tacoma International Airport, P.O. Box 68727
Seattle, WA 98168

NVL LABS
INDUSTRIAL HYGIENE SERVICES
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RE: Bulk Asbestos Fiber Analysis; NVL Batch # 1608815.00

Client Project: U00245-Costs
Location: B Concourse Roof Replacement

Dear Ms. Reeves-Orth,

Enclosed please find test results for the 6 sample(s) submitted to our laboratory for analysis on 4/27/2016.

Examination of these samples was conducted for the presence of identifiable asbestos fibers using polarized light microscopy (PLM) with dispersion staining in accordance with both **EPA 600/M4-82-020**, Interim Method for the Determination of Asbestos in Bulk Insulation Samples and **EPA 600/R-93/116** Method for the Determination of Asbestos in Bulk Building Materials.

For samples containing more than one separable layer of materials, the report will include findings for each layer (labeled Layer 1 and Layer 2, etc. for each individual layer). The asbestos concentration in the sample is determined by calibrated visual estimation.

For those samples with asbestos concentrations between 1 and 10 percent based on visual estimation, the EPA recommends a procedure known as point counting (NESHAPS, 40 CFR Part 61). Point counting is a statistically more accurate means of quantification for samples with low concentrations of asbestos.

The detection limit for the calibrated visual estimation is <1%, 400 point counts is 0.25% and 1000 point counts is 0.1%

Samples are archived for two weeks following analysis. Samples that are not retrieved by the client are discarded after two weeks.

Thank you for using our laboratory services. Please do not hesitate to call if there is anything further we can assist you with.

Sincerely,

Lori Tseng, PLM Analyst

Enc.: Sample Results

NVLAP Lab Code: 102063-0

1.888.NVL.LABS
1.888.(685.5227)
www.nvllabs.com

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p 206.547.0100 | f 206.634.1936

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4708 Aurora Ave N, Seattle, WA 98103
p 206.547.0100 | f 206.634.1936 | www.nvllabs.com

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: Port of Seattle - PCS
Address: AOB 5th Floor Seattle-Tacoma International Airport, P.O. Box 68727 Seattle, WA 98168
Attention: Ms. Debra Reeves-Orth
Project Location: B Concourse Roof Replacement

Batch #: 1608815.00
Client Project #: U00245-Costs
Date Received: 4/27/2016
Samples Received: 6
Samples Analyzed: 6
Method: EPA/600/R-93/116 & EPA/600/M4-82-020

Lab ID: 16209303 **Client Sample #: B Roof - 01**
Location: B Concourse Roof Replacement
Layer 1 of 1 **Description:** White rubbery material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Rubber/Binder, Paint	None Detected ND	**None Detected ND**

Lab ID: 16209304 **Client Sample #: B Roof - 02**
Location: B Concourse Roof Replacement
Layer 1 of 1 **Description:** Soft white rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Rubber/Binder, Fine particles, Miscellaneous particles	Cellulose <1%	**None Detected ND**

Lab ID: 16209305 **Client Sample #: B Roof - 03**
Location: B Concourse Roof Replacement
Layer 1 of 1 **Description:** Soft black rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Rubber/Binder, Fine particles, Miscellaneous particles	None Detected ND	**None Detected ND**

Lab ID: 16209306 **Client Sample #: B Roof - 04**
Location: B Concourse Roof Replacement
Layer 1 of 1 **Description:** Soft black rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Rubber/Binder, Fine particles, Miscellaneous particles	Cellulose 1%	**None Detected ND**
Paint particles		

Lab ID: 16209307 **Client Sample #: B Roof - 05**
Location: B Concourse Roof Replacement

Sampled by: Client
Analyzed by: Matt Macfarlane **Date:** 04/27/2016
Reviewed by: Lori Tseng **Date:** 04/29/2016

Lori Tseng, PLM Analyst

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: Port of Seattle - PCS
Address: AOB 5th Floor Seattle-Tacoma International Airport, P.O. Box 68727 Seattle, WA 98168
Attention: Ms. Debra Reeves-Orth
Project Location: B Concourse Roof Replacement

Batch #: 1608815.00
Client Project #: U00245-Costs
Date Received: 4/27/2016
Samples Received: 6
Samples Analyzed: 6
Method: EPA/600/R-93/116 & EPA/600/M4-82-020

Layer 1 of 1 **Description:** White tacky rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Rubber/Binder, Calcareous particles, Fine particles	None Detected ND	**None Detected ND**

Lab ID: 16209308 **Client Sample #: B Roof - 06**
Location: B Concourse Roof Replacement

Layer 1 of 1 **Description:** Soft grey rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Rubber/Binder, Fine particles	Cellulose <1%	**None Detected ND**

Sampled by: Client
Analyzed by: Matt Macfarlane **Date:** 04/27/2016
Reviewed by: Lori Tseng **Date:** 04/29/2016

Lori Tseng, PLM Analyst

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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ASBESTOS LABORATORY SERVICES

Company Port of Seattle - PCS
Address AOB 5th Floor Seattle-Tacoma International Airport, P.O. Box 68727
Project Manager Ms. Debra Reeves-Orth
Phone (206) 787-5390
Direct (206) 399-3994

NVL Batch Number **1608815.00**
TAT 1 Day **AH** No
Rush TAT
Due Date 4/28/2016 **Time** 8:15 AM
Email reeves-orth.d@portseattle.org
Fax (206) 787-5198

Project Name/Number: U00245-Costs **Project Location:** B Concourse Roof Replacement

Subcategory PLM Bulk
Item Code ASB-02 EPA 600/R-93-116 Asbestos by PLM <bulk>

Total Number of Samples 6 Rush Samples

	Lab ID	Sample ID	Description	A/R
1	16209303	B Roof - 01		A
2	16209304	B Roof - 02		A
3	16209305	B Roof - 03		A
4	16209306	B Roof - 04		A
5	16209307	B Roof - 05		A
6	16209308	B Roof - 06		A

	Print Name	Signature	Company	Date	Time
Sampled by	Client				
Relinquished by	Airport Drop Box				

Office Use Only	Print Name	Signature	Company	Date	Time
Received by	Matt Macfarlane		NVL	4/27/16	0815
Analyzed by	Matt Macfarlane		NVL	4/27/16	1:24 PM
Results Called by					
☐ **Faxed** ☐ **Emailed**					

Special Instructions: See Client COC for Reporting Instructions.

Date: 4/27/2016
Time: 10:28 AM
Entered By: Matt Macfarlane

1608815

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ASBESTOS CHAIN OF CUSTODY

Turn Around Time
- ❑ 1 Hour
- ☑ 24 Hours
- ❑ 4 Days
- ❑ 2 Hours
- ❑ 2 Days
- ❑ 5 Days
- ❑ 4 Hours
- ❑ 3 Days
- ❑ 10 Days

Please call for TAT less than 24 Hours

Company: Port of Seattle - PCS
Address: STIA
Phone: 787-4074

Project Manager: Debbie Reeves-Orth
Cell: (206) 399 - 3994
Email: reeves-orth.d@portseattle.org
Fax: ( ) -

Project Name/Number: U00245/Costs
Project Location: B Concourse Roof Replacement

- ❑ PCM Air (NIOSH 7400)
- ☑ PLM (EPA 600/R-93-116)
- ❑ PLM Gravimetry (600/R-93-116)
- ❑ Asbestos Friable/Non-Friable (EPA 600/R-93/116)
- ❑ TEM (NIOSH 7402)
- ❑ EPA 400 Points (600/R-93-116)
- ❑ Asbestos in Vermiculite (EPA 600/R-04/004)
- ❑ TEM (AHERA)
- ❑ Other
- ❑ TEM (EPA Level II Modified)
- ❑ EPA 1000Points (600/R-93-116)
- ❑ Asbestos in Sediment (EPA 1900 Points)

Reporting Instructions: Email erwin.t@portseattle.org reeves-orth.d@portseattle.org
❑ Call ( ) - ❑ Fax ( ) - ☑ Email

Total Number of Samples ____

	Sample ID	Description	A/R
1	B Roof - 01		
2	B Roof - 02		
3	B Roof - 03		
4	B Roof - 04		
5	B Roof - 05		
6	B Roof - 06		
7			
8			
9			
10			
11			
12			
13			
14			
15			

	Print Name	Signature	Company	Date	Time
Sampled by	Debra Reeves-Orth	D. Reeves-Orth	Port of Seattle (POS)	4-21-10	
Relinquish by	Debra Reeves-Orth	D. Reeves-Orth	Port of Seattle (POS)	4-4-10	BOX - 4-27

Office Use Only

	Print Name	Signature	Company	Date	Time
Received by	[illegible]	[illegible]	[illegible]	4/27/10	CERTS ADD
Analyzed by					
Called by					
Faxed/Email by					

Port of Seattle **Asbestos Survey Homogeneous Sam** **1608815**

Project Name: **B Concourse Roof Replacement** POS Project ID #**U00245**

Date : April 21, 2016 Activity Code COSTS

HSA # **1** HSA Material Type ___ HAS Location **Roof** Photo # ___

Color **White** HSA Material Description Roof Sealant at expansion joint

HSA Quantity: SF LF EA Friable? Yes No Condition Good (No visible damage)
Fair (<5% damage)
Poor (>5% damage)

Category Surfacing TSI Misc

Sample # **B Roof - 01** Building: **C Conc** Level: **Roof** Room: ___

Sample Location: **Expansion Joint by new DL Club See map** Results: ___
Comments: ___

HSA # **1** HSA Material Type ___ HAS Location **Roof** Photo # ___

Color **White** HSA Material Description Roof Sealant at expansion joint

HSA Quantity: SF LF EA Friable? Yes No Condition Good (No visible damage)
Fair (<5% damage)
Poor (>5% damage)

Category Surfacing TSI Misc

Sample # **B Roof - 02** Building: **C Conc** Level: **Roof** Room: ___

Sample Location: **Expansion Joint between B7 and B9 (about 20" south of B7) see map** Results: ___
Comments: ___

HSA # **2** HSA Material Type ___ HAS Location **Roof** Photo # ___

Color **Black** HSA Material Description Window Sealant skylights end of B

HSA Quantity: SF LF EA Friable? Yes No Condition Good (No visible damage)
Fair (<5% damage)
Poor (>5% damage)

Category Surfacing TSI Misc

Sample # **B Roof - 03** Building: **C Conc** Level: **Roof** Room: ___

Sample Location: **Skylights end of B concourse** Results: ___
Comments: ___

Signature D. Reeves-Orth Certification 153271 10/06/16
Inspector Name: Debbie Reeves-Orth Firm: Port Construction Services Expiration Date

Port of Seattle **Asbestos Survey Homogeneous Samp** **1608815**

Project Name: **B Concourse Roof Replacement** POS Project ID #**U00245**

Date : April 21, 2016 Activity Code COSTS

HSA # **2** HSA Material Type ___ HAS Location **Roof** Photo # _____

Color **Black** HSA Material Description Window Sealant skylights end of B

HSA Quantity: SF LF EA Friable? Yes No Condition Good (No visible damage)
Fair (<5% damage)
Poor (>5% damage)

Category Surfacing TSI Misc

Sample # **B Roof - 04** Building: **C Conc** Level: **Roof** Room: _____

Sample Location: **Skylights end of B concourse** Results: _____
Comments: _____

HSA # **3** HSA Material Type ___ HAS Location **Roof** Photo # _____

Color **White** HSA Material Description Sealant on vent

HSA Quantity: SF LF EA Friable? Yes No Condition Good (No visible damage)
Fair (<5% damage)
Poor (>5% damage)

Category Surfacing TSI Misc

Sample # **B Roof - 05** Building: **C Conc** Level: **Roof** Room: _____

Sample Location: **by vent ref gate B8 see map** Results: ____
Comments: _____

HSA # **2** HSA Material Type ___ HAS Location **Roof** Photo # _____

Color **Black** HSA Material Description Sealant

HSA Quantity: SF LF EA Friable? Yes No Condition Good (No visible damage)
Fair (<5% damage)
Poor (>5% damage)

Category Surfacing TSI Misc

Sample # **B Roof - 06** Building: **C Conc** Level: **Roof** Room: _____

Sample Location: **By Gate B3** Results: _____
Comments: _____

Signature D. Reeves-Orth Certification 153271 10/06/16
Inspector Name: Debbie Reeves-Orth Firm: Port Construction Services Expiration Date

June 9, 2016

Debra Reeves-Orth
Port of Seattle - PCS
AOB 5th Floor Seattle-Tacoma International Airport, P.O. Box 68727
Seattle, WA 98168

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RE: Bulk Asbestos Fiber Analysis; NVL Batch # 1611944.00

Client Project: U00245-COSTS
Location: B Concourse Roof

Dear Ms. Reeves-Orth,

Enclosed please find test results for the 7 sample(s) submitted to our laboratory for analysis on 6/9/2016.

Examination of these samples was conducted for the presence of identifiable asbestos fibers using polarized light microscopy (PLM) with dispersion staining in accordance with both **EPA 600/M4-82-020**, Interim Method for the Determination of Asbestos in Bulk Insulation Samples and **EPA 600/R-93/116** Method for the Determination of Asbestos in Bulk Building Materials.

For samples containing more than one separable layer of materials, the report will include findings for each layer (labeled Layer 1 and Layer 2, etc. for each individual layer). The asbestos concentration in the sample is determined by calibrated visual estimation.

For those samples with asbestos concentrations between 1 and 10 percent based on visual estimation, the EPA recommends a procedure known as point counting (NESHAPS, 40 CFR Part 61). Point counting is a statistically more accurate means of quantification for samples with low concentrations of asbestos.

The detection limit for the calibrated visual estimation is <1%, 400 point counts is 0.25% and 1000 point counts is 0.1%

Samples are archived for two weeks following analysis. Samples that are not retrieved by the client are discarded after two weeks.

Thank you for using our laboratory services. Please do not hesitate to call if there is anything further we can assist you with.

Sincerely,

Lori Tseng, PLM Analyst

Enc.: Sample Results

NVLAP Lab Code: 102063-0

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: Port of Seattle - PCS
Address: AOB 5th Floor Seattle-Tacoma International Airport, P.O. Box 68727 Seattle, WA 98168
Attention: Ms. Debra Reeves-Orth
Project Location: B Concourse Roof

Batch #: 1611944.00
Client Project #: U00245-COSTS
Date Received: 6/9/2016
Samples Received: 7
Samples Analyzed: 7
Method: EPA/600/R-93/116 & EPA/600/M4-82-020

Lab ID: 16227691 **Client Sample #: B Conc Roof - 01**
Location: B Concourse Roof

Layer 1 of 3 **Description:** White rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Rubber/Binder, Organic debris, Fine particles	Synthetic fibers 21%	**None Detected ND**

Layer 2 of 3 **Description:** Soft grey sticky material with green crumbly material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Calcareous particles, Fine particles	Glass fibers 40%	**None Detected ND**

Layer 3 of 3 **Description:** Off-white chalky material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Gypsum/Binder, Calcareous particles	Glass fibers 3%	**None Detected ND**

Lab ID: 16227692 **Client Sample #: B Conc Roof - 02**
Location: B Concourse Roof

Layer 1 of 2 **Description:** White/grey rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Rubber/Binder	Synthetic fibers 24%	**None Detected ND**

Layer 2 of 2 **Description:** Off-white crumbly material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Calcareous binder, Mica, Fine particles Fine grains	Cellulose 1%	**None Detected ND**

Lab ID: 16227693 **Client Sample #: B Conc Roof - 03**
Location: B Concourse Roof

Layer 1 of 1 **Description:** Off-white crumbly material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Calcareous binder, Fine grains, Mica	Cellulose <1%	**None Detected ND**

Sampled by: Client
Analyzed by: Matt Macfarlane **Date:** 06/09/2016
Reviewed by: Lori Tseng **Date:** 06/09/2016

Lori Tseng, PLM Analyst

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: Port of Seattle - PCS
Address: AOB 5th Floor Seattle-Tacoma International Airport, P.O. Box 68727 Seattle, WA 98168
Attention: Ms. Debra Reeves-Orth
Project Location: B Concourse Roof

Batch #: 1611944.00
Client Project #: U00245-COSTS
Date Received: 6/9/2016
Samples Received: 7
Samples Analyzed: 7
Method: EPA/600/R-93/116 & EPA/600/M4-82-020

Fine particles

Lab ID: 16227694 **Client Sample #: B Conc Roof - 04**
Location: B Concourse Roof

Layer 1 of 2 **Description:** White/grey rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Rubber/Binder, Calcareous particles	Synthetic fibers 20%	**None Detected ND**

Layer 2 of 2 **Description:** Off-white crumbly material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Calcareous binder, Mica, Fine particles	None Detected ND	**None Detected ND**

Lab ID: 16227695 **Client Sample #: B Conc Roof - 05**
Location: B Concourse Roof

Layer 1 of 2 **Description:** White/grey rubbery material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Rubber/Binder, Calcareous particles	Synthetic fibers 22%	**None Detected ND**

Layer 2 of 2 **Description:** Off-white crumbly material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Calcareous binder, Fine grains, Mica Fine particles	Cellulose 2%	**None Detected ND**

Lab ID: 16227696 **Client Sample #: B Conc Roof - 06**
Location: B Concourse Roof

Layer 1 of 1 **Description:** Off-white crumbly material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Calcareous binder, Mica, Fine particles	Cellulose <1%	**None Detected ND**

Sampled by: Client
Analyzed by: Matt Macfarlane **Date:** 06/09/2016
Reviewed by: Lori Tseng **Date:** 06/09/2016

Lori Tseng, PLM Analyst

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: Port of Seattle - PCS
Address: AOB 5th Floor Seattle-Tacoma International Airport, P.O. Box 68727 Seattle, WA 98168
Attention: Ms. Debra Reeves-Orth
Project Location: B Concourse Roof

Batch #: 1611944.00
Client Project #: U00245-COSTS
Date Received: 6/9/2016
Samples Received: 7
Samples Analyzed: 7
Method: EPA/600/R-93/116 & EPA/600/M4-82-020

Lab ID: 16227697 **Client Sample #: B Conc Roof - 07**
Location: B Concourse Roof

Layer 1 of 1 **Description:** Off-white crumbly material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Calcareous binder, Fine particles, Mica	Cellulose 2%	**None Detected ND**
Fine grains		

Sampled by: Client
Analyzed by: Matt Macfarlane **Date:** 06/09/2016
Reviewed by: Lori Tseng **Date:** 06/09/2016

Lori Tseng, PLM Analyst

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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ASBESTOS LABORATORY SERVICES

Company Port of Seattle - PCS
Address AOB 5th Floor Seattle-Tacoma International Airport, P.O. Box 68727
Project Manager Ms. Debra Reeves-Orth
Phone (206) 787-5390
Direct (206) 399-3994

NVL Batch Number **1611944.00**
TAT 1 Day **AH** No
Rush TAT
Due Date 6/10/2016 **Time** 8:15 AM
Email reeves-orth.d@portseattle.org
Fax (206) 787-5198

Project Name/Number: U00245-COSTS **Project Location:** B Concourse Roof

Subcategory PLM Bulk
Item Code ASB-02 EPA 600/R-93-116 Asbestos by PLM <bulk>

Total Number of Samples 7 Rush Samples

	Lab ID	Sample ID	Description	A/R
1	16227691	B Conc Roof - 01		A
2	16227692	B Conc Roof - 02		A
3	16227693	B Conc Roof - 03		A
4	16227694	B Conc Roof - 04		A
5	16227695	B Conc Roof - 05		A
6	16227696	B Conc Roof - 06		A
7	16227697	B Conc Roof - 07		A

	Print Name	Signature	Company	Date	Time
Sampled by	Client				
Relinquished by	Airport Drop Box				

Office Use Only	Print Name	Signature	Company	Date	Time
Received by	Matt Macfarlane		NVL	6/9/16	0815
Analyzed by	Matt Macfarlane		NVL	6/9/16	
Results Called by					
☐ **Faxed** ☐ **Emailed**					

Special Instructions: See Client COC for Reporting Instructions.

Date: 6/9/2016
Time: 9:13 AM
Entered By: Matt Macfarlane

1611944

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ASBESTOS CHAIN OF CUSTODY

Turn Around Time
- ❑ 1 Hour
- ☑ 24 Hours
- ❑ 4 Days
- ❑ 2 Hours
- ❑ 2 Days
- ❑ 5 Days
- ❑ 4 Hours
- ❑ 3 Days
- ❑ 10 Days

Please call for TAT less than 24 Hours

Company: Port of Seattle - PCS
Address: STIA
Phone: 787-4074

Project Manager: Debbie Reeves-Orth
Cell: (206) 399 - 3994
Email: reeves-orth.d@portseattle.org
Fax: ( ) -

Project Name/Number: U00245/COSTS
Project Location: B Concourse Roof

- ❑ PCM Air (NIOSH 7400)
- ❑ TEM (NIOSH 7402)
- ❑ TEM (AHERA)
- ❑ TEM (EPA Level II Modified)
- ☑ PLM (EPA 600/R-93-116)
- ❑ EPA 400 Points (600/R-93-116)
- ❑ EPA 1000Points (600/R-93-116)
- ❑ PLM Gravimetry (600/R-93-116)
- ☑ Asbestos in Vermiculite (EPA 600/R-04/004)
- ❑ Asbestos in Sediment (EPA 1900 Points)
- ❑ Asbestos Friable/Non-Friable (EPA 600/R-93/116)
- ❑ Other

Reporting Instructions: Email erwin.t@portseattle.org reeves-orth.d@portseattle.org

❑ Call ( ) - ❑ Fax ( ) - ☑ Email

Total Number of Samples 7

	Sample ID	Description	A/R
1	B conc roof - 01		
2	B conc roof - 02		
3	B conc roof - 03		
4	B conc roof - 04		
5	B conc roof - 05		
6	B conc roof - 06		
7	B conc roof - 07		
8			
9			
10			
11			
12			
13			
14			
15			

	Print Name	Signature	Company	Date	Time
Sampled by	Debra Reeves-Orth	D Reeves-Orth	Port of Seattle (POS)	6-8-16	1400
Relinquish by	Debra Reeves-Orth	D Reeves-Orth	Port of Seattle (POS)	6-8-16	800

Office Use Only

	Print Name	Signature	Company	Date	Time
Received by	MATTHEW			6/9/16	0815 AM
Analyzed by					
Called by					
Faxed/Email by					

1611944

Port of Seattle **Asbestos Survey Homogeneous Sampl**

Project Name: **B Conc Roof Replacement** POS Project ID #**U00245**
Date : May 12, 2016 Activity Code COSTS

HSA # **1** HSA Material Type **roofing** HAS Location **roof** Photo # _____

Color **gray** HSA Material Description PVC roofing and concrete

HSA Quantity: SF LF EA Friable? Yes No Condition Good (No visible damage)
Fair (<5% damage)
Poor (>5% damage)

Category Surfacing TSI Misc

Sample # **B conc roof – 01** Building: **B Conc** Level: **roof** Room: _____

Sample Location: **F-5, close to door at MT mezz** Results: _____
Comments: _____

HSA # **1** HSA Material Type **roofing** HAS Location **roof** Photo # _____

Color **gray** HSA Material Description PVC roofing and Light weight insulation fill

HSA Quantity: SF LF EA Friable? Yes No Condition Good (No visible damage)
Fair (<5% damage)
Poor (>5% damage)

Category Surfacing TSI Misc

Sample # **B conc roof – 02** Building: **B Conc** Level: **roof** Room: _____

Sample Location: **H-44** Results: _____
Comments: _____

HSA # **1** HSA Material Type **roofing** HAS Location **roof** Photo # _____

Color **gray** HSA Material Description Light weight insulation fill

HSA Quantity: SF LF EA Friable? Yes No Condition Good (No visible damage)
Fair (<5% damage)
Poor (>5% damage)

Category Surfacing TSI Misc

Sample # **B conc roof – 03** Building: **B Conc** Level: **roof** Room: _____

Sample Location: **H,2-39** Results: _____
Comments: _____

Signature D Reeves-Orth Certification 153271 10/06/16
Inspector Name: Debbie Reeves-Orth Firm: Port Construction Services Expiration Date

1611944

Port of Seattle **Asbestos Survey Homogeneous Samp**

Project Name: **B Conc Roof Replacement** POS Project ID #**U00245**
Date : May 12, 2016 Activity Code COSTS

HSA # **1** HSA Material Type **roofing** HAS Location **roof** Photo # _____

Color **gray** HSA Material Description Light weight insulation fill

HSA Quantity: SF LF EA Friable? Yes No Condition Good (No visible damage)
Fair (<5% damage)
Poor (>5% damage)

Category Surfacing TSI Misc

Sample # **B conc roof – 04** Building: **B Conc** Level: **roof** Room: _____

Sample Location: **G-40 ,** Results: _____
Comments: _____

HSA # **1** HSA Material Type **roofing** HAS Location **roof** Photo # _____

Color **gray** HSA Material Description PVC roofing and Light weight insulation fill

HSA Quantity: SF LF EA Friable? Yes No Condition Good (No visible damage)
Fair (<5% damage)
Poor (>5% damage)

Category Surfacing TSI Misc

Sample # **B conc roof – 05** Building: **B Conc** Level: **roof** Room: _____

Sample Location: **D-31.5** Results: _____
Comments: _____

HSA # **1** HSA Material Type **roofing** HAS Location **roof** Photo # _____

Color **gray** HSA Material Description Light weight insulation fill

HSA Quantity: SF LF EA Friable? Yes No Condition Good (No visible damage)
Fair (<5% damage)
Poor (>5% damage)

Category Surfacing TSI Misc

Sample # **B conc roof – 06** Building: **B Conc** Level: **roof** Room: _____

Sample Location: **E-20.5 In Hatch BH7 taken in pan deck groves** Results: _____
Comments: _____

Signature Debbie Reeves-Orth Certification 153271 10/06/16
Inspector Name: Debbie Reeves-Orth Firm: Port Construction Services Expiration Date

1611944

Port of Seattle **Asbestos Survey Homogeneous Sam**

Project Name: **B Conc Roof Replacement** POS Project ID #**U00245**
Date : May 12, 2016 Activity Code COSTS

HSA # **1** HSA Material Type **roofing** HAS Location **roof** Photo # _____

Color **gray** HSA Material Description Light weight insulation fill

HSA Quantity: SF LF EA Friable? Yes No Condition Good (No visible damage)
Fair (<5% damage)
Poor (>5% damage)

Category Surfacing TSI Misc

Sample # **B conc roof – 07** Building: **B Conc** Level: **roof** Room: _____

Sample Location: **E-18 In Hatch BH5 taken in pan deck groves** Results: _____
Comments: _____

HSA # _____ HSA Material Type _____ HSA Location _____ Photo # _____

Color _____ HSA Material Description _____
Size _____

HSA Quantity: _____ SF LF EA Friable? Yes No Condition Good (No visible damage)
Fair (<5% damage)
Poor (>5% damage)

Category Surfacing TSI Misc.
Sample # _____ Building: _____ Level _____ Room _____

Sample Location: _____ Results: _____
Comments: _____
Comments: _____

HSA # _____ HSA Material Type _____ HSA Location _____ Photo # _____

Color _____ HSA Material Description _____
Size _____

HSA Quantity: _____ SF LF EA Friable? Yes No Condition Good (No visible damage)
Fair (<5% damage)
Poor (>5% damage)

Category Surfacing TSI Misc.
Sample # _____ Building: _____ Level _____ Room _____

Sample Location: _____ Results: _____
Comments: _____
Comments: _____

Signature Debbie Reeves-Orth Certification 153271 10/06/16
Inspector Name: Debbie Reeves-Orth Firm: Port Construction Services Expiration Date

March 4, 2014

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Thomas Erwin
Port of Seattle-PCS
AOB 5th Floor Seattle-Tacoma International Airport, P.O. Box 68727
Seattle, WA 98168

RE: Bulk Asbestos Fiber Analysis, NVL Batch # 1403666.00

Dear Mr. Erwin,

Enclosed please find test results for the bulk samples submitted to our laboratory for analysis. Examination of these samples was conducted for the presence of identifiable asbestos fibers using polarized light microscopy (PLM) with dispersion staining in accordance with both U.S. EPA 600/M4-82-020, Interim Method for Determination of Asbestos in Bulk Insulation Samples, as found in 40 CFR, Part 763, Subpart E, Appendix E (formerly Subpart F, Appendix A), and U.S. EPA 600/R-93/116 (July 1993) Test Methods.

For samples containing more than one separable layer of materials, the report will include findings for each layer (labeled Layer 1 and Layer 2, etc. for each individual layer). The asbestos concentration in the sample is determined by visual estimation.

For those samples with asbestos concentrations between 1 and 10 percent based on visual estimation, the EPA recommends a procedure known as point counting (NESHAPS, 40 CFR Part 61). Point counting is a statistically more accurate means of quantification for samples with low concentrations of asbestos. If you would like us to further refine the concentration estimates of asbestos in these samples using point counting, please let me know.

This report is considered highly confidential and will not be released without your approval. Samples are archived for two weeks following analysis. Samples that are not retrieved by the client are discarded after two weeks.

Thank you for using our laboratory services. Please do not hesitate to call if there is anything further we can assist you with.

Sincerely,

Nick Ly, Technical Director

Enc.: Sample Results

NVLAP
Lab Code: 102063-0

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1.888.(685.5227)
www.nvllabs.com

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For the scope of accreditation under NVLAP Lab Code 102063-0

Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: Port of Seattle-PCS
Address: AOB 5th Floor Seattle-Tacoma International Airport, P.O. Box 68727 Seattle, WA 98168
Attention: Mr. Thomas Erwin
Project Location: Project ID 105041 Activity. B, C, D Interstitial Spaces

Batch #: 1403666.00
Client Project #: S-00317456
Date Received: 3/4/2014
Samples Received: 12
Samples Analyzed: 12
Method: EPA/600/R-93/116 & EPA/600/M4-82-020

Lab ID: 14023618 **Client Sample #: B3PH-01**
Location: Project ID 105041 Activity. B, C, D Interstitial Spaces
Layer 1 of 1 **Description:** White compacted powdery material with paper

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Calcareous particles, Binder/Filler	Cellulose 15%	**None Detected ND**

Lab ID: 14023619 **Client Sample #: B3PH-02**
Location: Project ID 105041 Activity. B, C, D Interstitial Spaces
Layer 1 of 1 **Description:** Gray fibrous material with foamy material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Synthetic foam	Cellulose 68%	**None Detected ND**

Lab ID: 14023620 **Client Sample #: B3PH-03**
Location: Project ID 105041 Activity. B, C, D Interstitial Spaces
Layer 1 of 1 **Description:** White chalky material with paper

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Gypsum/Binder, Calcareous particles	Cellulose 20%	**None Detected ND**
	Glass fibers 4%	

Lab ID: 14023621 **Client Sample #: BH14-04**
Location: Project ID 105041 Activity. B, C, D Interstitial Spaces
Layer 1 of 1 **Description:** Gray brittle/powdery material with micaceous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Calcareous particles, Vermiculite	Cellulose 3%	**None Detected ND**
	Wollastonite <1%	

Lab ID: 14023622 **Client Sample #: BH-9-05**
Location: Project ID 105041 Activity. B, C, D Interstitial Spaces

Sampled by: Client
Analyzed by: Lori Tseng **Date:** 03/04/2014
Reviewed by: Nick Ly **Date:** 03/04/2014 Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: Port of Seattle-PCS
Address: AOB 5th Floor Seattle-Tacoma International Airport, P.O. Box 68727 Seattle, WA 98168
Attention: Mr. Thomas Erwin
Project Location: Project ID 105041 Activity. B, C, D Interstitial Spaces

Batch #: 1403666.00
Client Project #: S-00317456
Date Received: 3/4/2014
Samples Received: 12
Samples Analyzed: 12
Method: EPA/600/R-93/116 & EPA/600/M4-82-020

Layer 1 of 2	**Description:** Black asphaltic fibrous material with tar		
	Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
	Asphalt/Binder, Binder/Filler	Cellulose 70%	**None Detected ND**
		Synthetic fibers 2%	
Layer 2 of 2	**Description:** Brown fibrous material		
	Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
	Binder/Filler, Perlite	Cellulose 67%	**None Detected ND**

Lab ID: 14023623 **Client Sample #: BH-9-06**
Location: Project ID 105041 Activity. B, C, D Interstitial Spaces

Layer 1 of 2	**Description:** Gray brittle/powdery material with micaceous material & gravels		
	Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
	Binder/Filler, Calcareous particles, Vermiculite	Cellulose 6%	**None Detected ND**
	Gravels		
Layer 2 of 2	**Description:** Brown fibrous material		
	Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
	Binder/Filler, Perlite	Cellulose 69%	**None Detected ND**

Lab ID: 14023624 **Client Sample #: C-01**
Location: Project ID 105041 Activity. B, C, D Interstitial Spaces

Layer 1 of 1	**Description:** White chalky material with paper		
	Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
	Binder/Filler, Gypsum/Binder	Cellulose 20%	**None Detected ND**
		Glass fibers 4%	

Lab ID: 14023625 **Client Sample #: C-02**
Location: Project ID 105041 Activity. B, C, D Interstitial Spaces

Sampled by: Client
Analyzed by: Lori Tseng **Date:** 03/04/2014
Reviewed by: Nick Ly **Date:** 03/04/2014

Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: Port of Seattle-PCS
Address: AOB 5th Floor Seattle-Tacoma International Airport, P.O. Box 68727 Seattle, WA 98168
Attention: Mr. Thomas Erwin
Project Location: Project ID 105041 Activity. B, C, D Interstitial Spaces

Batch #: 1403666.00
Client Project #: S-00317456
Date Received: 3/4/2014
Samples Received: 12
Samples Analyzed: 12
Method: EPA/600/R-93/116 & EPA/600/M4-82-020

Layer 1 of 1	**Description:** White compacted powdery material with paper		
	Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
	Calcareous particles, Binder/Filler	Cellulose 20%	**None Detected ND**

Lab ID: 14023626 **Client Sample #: C2-03**
Location: Project ID 105041 Activity. B, C, D Interstitial Spaces
Comments: Unsure of correct layer sequence

Layer 1 of 4	**Description:** Gray brittle/powdery material with micaceous material		
	Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
	Binder/Filler, Calcareous particles, Vermiculite	Cellulose 5%	**None Detected ND**
Layer 2 of 4	**Description:** Gray fibrous material with foamy material		
	Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
	Binder/Filler, Synthetic foam	Cellulose 71%	**None Detected ND**
Layer 3 of 4	**Description:** Black asphaltic tar		
	Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
	Asphalt/Binder	Cellulose 3%	**None Detected ND**
Layer 4 of 4	**Description:** Brown fibrous material		
	Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
	Binder/Filler, Perlite	Cellulose 67%	**None Detected ND**

Lab ID: 14023627 **Client Sample #: C2-04**
Location: Project ID 105041 Activity. B, C, D Interstitial Spaces

Layer 1 of 2	**Description:** Black asphaltic fibrous material		
	Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
	Asphalt/Binder, Binder/Filler	Cellulose 70%	**None Detected ND**
		Synthetic fibers 4%	

Sampled by: Client
Analyzed by: Lori Tseng **Date:** 03/04/2014
Reviewed by: Nick Ly **Date:** 03/04/2014

Nick Ly, Technical Director

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

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Address: AOB 5th Floor Seattle-Tacoma International Airport, P.O. Box 68727 Seattle, WA 98168
Attention: Mr. Thomas Erwin
Project Location: Project ID 105041 Activity. B, C, D Interstitial Spaces

Batch #: 1403666.00
Client Project #: S-00317456
Date Received: 3/4/2014
Samples Received: 12
Samples Analyzed: 12
Method: EPA/600/R-93/116 & EPA/600/M4-82-020

Layer 2 of 2	**Description:** Gray powdery material with micaceous material		
	Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
	Binder/Filler, Calcareous particles, Vermiculite	Cellulose 4%	**None Detected ND**

Lab ID: 14023628 **Client Sample #: D-01**
Location: Project ID 105041 Activity. B, C, D Interstitial Spaces

Layer 1 of 2	**Description:** Gray powdery/fibrous material with foamy material		
	Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
	Binder/Filler, Synthetic foam	Cellulose 38%	**None Detected ND**
		Glass fibers 17%	
Layer 2 of 2	**Description:** Brown fibrous material		
	Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
	Wood flakes, Binder/Filler	Cellulose 10%	**None Detected ND**

Lab ID: 14023629 **Client Sample #: D-02**
Location: Project ID 105041 Activity. B, C, D Interstitial Spaces

Layer 1 of 1	**Description:** Gray powdery/fibrous material with foamy material		
	Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
	Binder/Filler, Calcareous particles, Synthetic foam	Cellulose 35%	**None Detected ND**
		Glass fibers 22%	

Sampled by: Client
Analyzed by: Lori Tseng **Date:** 03/04/2014
Reviewed by: Nick Ly **Date:** 03/04/2014


Nick Ly, Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

NVL Laboratories, Inc.
4708 Aurora Ave N, Seattle, WA 98103
Tel: 206.547.0100 Emerg.Cell: 206.914.4646
Fax: 206.634.1936 1.888.NVL.LABS (685.5227)

CHAIN of CUSTODY SAMPLE LOG

NVL Batch ID 1403666

Client: Port Construction Services
Street: 17301 International Boulevard
Sea Tac, WA 98188
Project Manager: Mr. Thomas Erwin / reeves-orth.d@portseattle.org
Project Location: B, C, D, Interstitial Spaces
787-5390 787-5198
Phone: (206) Fa

NVL Batch Number
Client Job Number: S-00317456 Project ID: 105041
Total Samples: 12 Activity
Turn Around Time: ☐ 1-Hr ☐ 8-Hrs ☒ 2 Days ☐ 5 Days ☐ 2-Hrs ☐ 12-Hrs ☐ 3 Days ☐ 6-10 Day ☐ 4-Hrs ☐ 24-Hrs ☐ 4 Days
Please call for TAT less than 24 Hrs
Email address: erwin.t@portseattle.org
Cell: (206) 953-9292

☐ Asbestos Air	☐ PCM (NIOSH 7400)	☐ TEM (NIOSH 7402)	☐ TEM (AHERA)	☐ TEM (EPA Level II) ☐ Other
☒ Asbestos Bulk	☐ PLM (EPA/600/R-93/116)	☐ PLM (EPA Point Count)	☐ PLM (EPA Gravimetry)	☐ TEM BULK
☐ Mold/Fungus	☐ Mold Air ☐ Mold Bulk	☐ Rotometer Calibration		

METALS	Det. Limit	Matrix		RCRA Metals		Other Metals
☐ Total Metals	☐ FAA (ppm)	☐ Air Filter	☐ Soil	☐ Arsenic (As)	☐ All 8	☐ All 3
☐ TCLP	☐ ICP (ppm)	☐ Drinking water	☐ Paint Chips in %	☐ Barium (Ba)	☐ Chromium (Cr	☐ Copper (Cu)
☐ Cr 6	☐ GFAA (ppl	☐ Dust/wipe (Area)	☐ Paint Chips in cn	☐ Cadmium (Cd)	☐ Lead (Pb)	☐ Nickel (Ni)
					☐ Mercury (Hg)	☐ Zinc (Zn)

☐ Other Types of Analysis: ☐ Fiberglass ☐ Silica ☐ Nuisance Dust ☐ Respirable Dust ☐ Other (Specify) _____

Condition of Package: ☐ Good ☐ Damaged (no spillage) ☐ Severe damage (spillage)

Seq. #	Lab ID	Client Sample Number	Comments (e.g Sample are, Sample Volume, etc)	A/R
1		B3PH-01	B Concourse	
2		B3PH-02		
3		B3PH-03		
4		BH14-04		
5		BH-9-05		
6		BH-9-06		
7		C-01	C Concourse	
8		C-02		
9		C2-03		
10		C2-04		
11		D-01	D Concourse	
12		D-02		
13				
14				
15				

	Print Below	Sign Below	Company	Date	Time
Sampled by	D Reeves-Orth	Debra Reeves-Orth	POS	3-3-14	1800
Relinquished by	"	"	POS	3-3-14	600
Received by	Lori Tom		NW	3/4/14	930
Analyzed by	Lori Tom		NW	3/4/14	1145
Results Called by					
Results Faxed by					

Special Instructions: Unless requested in writing, all samples will be disposed of two (2) weeks after analysis.

NVL Batch ID
1403666

Port of Seattle — Asbestos Survey Homogeneous Samplin

Project Name B,C,D Interstitial spaces POS Project ID # 105041

Date 3-3-14 Activity Code PCSRMM1

HSA # 1 HSA Material Type JT HSA Location wall Photo # _____

Color white HSA Material Description Joint Compound
Size _____ (Repeats from GWB)
HSA Quantity: _____ SF LF EA (Friable?) Yes No Condition Good (No visible damage)
Fair (<5% damage)
Poor (>5% damage)

Category Surfacing TSI Misc

Sample # B3PH-01 Building/Parcel B conc Level Penthouse Room B3

Sample Location: West wall Results: _____
Comments: mech Room

HSA # 2 HSA Material Type FP HSA Location _____ Photo # _____

Color _____ HSA Material Description fireproofing
Size _____
HSA Quantity: _____ SF LF EA (Friable?) Yes No Condition Good (No visible damage)
Fair (<5% damage)
Poor (>5% damage)

Category Surfacing TSI Misc.
Sample # B3PH-02 Building/Parcel B conc Level PH1 Room B3

Sample Location: By west wall Results: _____
Comments: same throughout mech Room

HSA # 3 HSA Material Type GWB HSA Location _____ Photo # _____

Color _____ HSA Material Description GWB
Size _____ drywall only
HSA Quantity: _____ SF LF EA Friable? Yes No Condition Good (No visible damage)
Fair (<5% damage)
Poor (>5% damage)

Category Surfacing TSI Misc.
Sample # B3PH-03 Building/Parcel B conc Level PH Room B3

Sample Location: Same as west wall Results: _____
Comments: Mech Room

Signature Debra Reeves-Orth Certification # 144344 10/30/14
Inspector Name Debra Reeves-Orth Firm PCS Expiration Date

NVL Batch ID
1403666

Port of Seattle — Asbestos Survey Homogeneous Samplin

Project Name B C D Interstitial Spaces POS Project ID # 105041

Date 3-3-14 Activity Code PCSRMM1

HSA # 1 HSA Material Type Fireproof debris HSA Location _____ Photo # _____

Color Gray HSA Material Description Fireproof debris
Size _____

HSA Quantity: _____ SF LF EA Friable? Yes No Condition Good (No visible damage)
Fair (<5% damage)
Poor (>5% damage)

Category Surfacing TSI Misc

Sample # BH 14 - 04 Building/Parcel B conc Level P.H Room BH 14

Sample Location: Roof - hole BH 14 Results: _____
Comments: debris

HSA # 4 HSA Material Type Paper HSA Location _____ Photo # _____

Color BLK HSA Material Description Paper w/ Asphaltic Layer Tan
Size _____

HSA Quantity: _____ SF LF EA Friable? Yes No Condition Good (No visible damage)
Fair (<5% damage)
Poor (>5% damage)

Category Surfacing TSI Misc.
Sample # BH9 - 05 Building/Parcel B conc Level P.H Room BH9

Sample Location: Hole to interstitial BH9 Results: _____
Comments: _____

HSA # 2 HSA Material Type FP HSA Location _____ Photo # _____

Color gray HSA Material Description Fireproofing : debris
Size _____

HSA Quantity: _____ SF LF EA Friable? Yes No Condition Good (No visible damage)
Fair (<5% damage)
Poor (>5% damage)

Category Surfacing TSI Misc.
Sample # BH9 - 06 Building/Parcel B conc Level P.H Room BH9

Sample Location: Hole to interstitial - BH9 Results: _____
Comments: _____

Signature Debra Reeves-Orth Certification # 144344 10/30/14
Inspector Name Debra Reeves-Orth Firm PCS Expiration Date

NVL Batch ID
1403666

Port of Seattle — Asbestos Survey Homogeneous Samplin

Project Name B, C, D. Interstitial spaces POS Project ID # 105041

Date 3-3-14 Activity Code PCS Smm 1

HSA # 3 HSA Material Type GWB HSA Location Mech Rm Photo # _____

Color White HSA Material Description GWB
Size _____

HSA Quantity: _____ SF LF EA (Friable?) Yes No Condition Good (No visible damage)
Fair (<5% damage)
Poor (>5% damage)

Category Surfacing TSI (Misc)

Sample # C - 01 Building/Parcel C conc Level PH Room Mech C2

Sample Location: Mech. Room. C2 Results: _____
Comments: South wall

HSA # 1 HSA Material Type _____ HSA Location wall Photo # _____

Color _____ HSA Material Description Joint Compound
Size _____ same as above

HSA Quantity: _____ SF LF EA Friable? Yes No Condition Good (No visible damage)
Fair (<5% damage)
Poor (>5% damage)

Category Surfacing TSI Misc.
Sample # C - 02 Building/Parcel Same ↑ Level PH Room C2

Sample Location: same ↑ Results: _____
Comments: Joint compound only Mech Space Room

HSA # 2 HSA Material Type FB HSA Location _____ Photo # _____

Color Gray HSA Material Description FP : debris
Size _____

HSA Quantity: _____ SF LF EA (Friable?) Yes No Condition Good (No visible damage)
Fair (<5% damage)
Poor (>5% damage)

Category Surfacing TSI Misc.
Sample # C2 - 03 Building/Parcel C conc Level PH Room C2

Sample Location: Hole/Box to interstitial - C2 Results: _____
Comments: _____

Signature Debra Reeves-Orth Certification # 144344 10/30/14
Inspector Name Debra Reeves-Orth Firm PCS Expiration Date

NVL Batch ID
1403666

Port of Seattle — Asbestos Survey Homogeneous Sampling

Project Name B.C.D. Interstitial space POS Project ID # 10504

Date 3-3-14 Activity Code PCS Rnm 1

HSA # 5 HSA Material Type _____ HSA Location _____ Photo # _____

Color gray ash HSA Material Description Paper -
Size _____

HSA Quantity: _____ SF LF EA Friable? Yes No Condition Good (No visible damage)
Fair (<5% damage)
Poor (>5% damage)

Category Surfacing TSI Misc

Sample # C2-04 Building/Parcel C conc. Level PH Room C2

Sample Location: Hole/Box to interstitial from Roof Results: _____
Comments: not sure of origin C2
found on floor —

HSA # 2 HSA Material Type FP HSA Location _____ Photo # _____

Color Gray HSA Material Description FP & debris
Size _____ Fireproofing

HSA Quantity: _____ SF LF EA (Friable?) Yes No Condition Good (No visible damage)
Fair (<5% damage)
Poor (>5% damage)

Category Surfacing TSI Misc.
Sample # D-01 Building/Parcel D conc Level PH Room D

Sample Location: End Hole/Box . North Results: _____
Comments: _____

HSA # 2 HSA Material Type FP HSA Location _____ Photo # _____

Color Gray HSA Material Description Fireproofing
Size _____

HSA Quantity: _____ SF LF EA (Friable?) Yes No Condition Good (No visible damage)
Fair (<5% damage)
Poor (>5% damage)

Category Surfacing TSI Misc.
Sample # D-02 Building/Parcel D conc Level PH Room D

Sample Location: Same as . Results: _____
Comments: _____

Signature Debra Reeves-Orth Certification # 144344 10/30/14
Inspector Name Debra Reeves-Orth Firm PCS Expiration Date

July 15, 2015

Brian Nichols
Port of Seattle - PCS
AOB 5th Floor Seattle-Tacoma International Airport, P.O. Box 68727
Seattle, WA 98168

NVL LABS
INDUSTRIAL HYGIENE SERVICES
Laboratory | Management | Training

RE: Bulk Asbestos Fiber Analysis; NVL Batch # 1512733.00

Client Project: Contract S-00317456
Location: Project ID: 105198 Activity: PCSRMM2

Dear Mr. Nichols,

Enclosed please find test results for the 15 sample(s) submitted to our laboratory for analysis on 7/14/2015.

Examination of these samples was conducted for the presence of identifiable asbestos fibers using polarized light microscopy (PLM) with dispersion staining in accordance with both **EPA 600/M4-82-020**, Interim Method for the Determination of Asbestos in Bulk Insulation Samples and **EPA 600/R-93/116** Method for the Determination of Asbestos in Bulk Building Materials.

For samples containing more than one separable layer of materials, the report will include findings for each layer (labeled Layer 1 and Layer 2, etc. for each individual layer). The asbestos concentration in the sample is determined by calibrated visual estimation.

For those samples with asbestos concentrations between 1 and 10 percent based on visual estimation, the EPA recommends a procedure known as point counting (NESHAPS, 40 CFR Part 61). Point counting is a statistically more accurate means of quantification for samples with low concentrations of asbestos.

The detection limit for the calibrated visual estimation is <1%, 400 point counts is 0.25% and 1000 point counts is 0.1%

Samples are archived for two weeks following analysis. Samples that are not retrieved by the client are discarded after two weeks.

Thank you for using our laboratory services. Please do not hesitate to call if there is anything further we can assist you with.

Sincerely,

Nick Ly, Laboratory Technical Director

Enc.: Sample Results

NVLAP
Lab Code: 102063-0

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1.888.(685.5227)
www.nvllabs.com

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: Port of Seattle - PCS
Address: AOB 5th Floor Seattle-Tacoma International Airport, P.O. Box 68727 Seattle, WA 98168
Attention: Mr. Brian Nichols
Project Location: Project ID: 105198 Activity: PCSRMM2

Batch #: 1512733.00
Client Project #: Contract S-00317456
Date Received: 7/14/2015
Samples Received: 15
Samples Analyzed: 15
Method: EPA/600/R-93/116 & EPA/600/M4-82-020

Lab ID: 15070073 **Client Sample #: C-A18**
Location: Project ID: 105198 Activity: PCSRMM2

Layer 1 of 2	**Description:** Gray vinyl material			
	Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
	Vinyl/Binder, Quartz, Organic debris	Synthetic fibers	3%	**None Detected ND**
		Cellulose	2%	
		Hair	2%	
Layer 2 of 2	**Description:** Trace tan soft mastic			
	Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
	Mastic/Binder	Cellulose	3%	**None Detected ND**

Lab ID: 15070074 **Client Sample #: C-A19**
Location: Project ID: 105198 Activity: PCSRMM2

Layer 1 of 2	**Description:** Trace white compacted powdery material			
	Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
	Calcareous particles, Binder/Filler	Cellulose	<1%	**None Detected ND**
Layer 2 of 2	**Description:** White chalky material with paper			
	Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
	Gypsum/Binder, Fine particles	Cellulose	17%	**None Detected ND**
		Glass fibers	3%	

Lab ID: 15070075 **Client Sample #: C-A20**
Location: Project ID: 105198 Activity: PCSRMM2

Layer 1 of 3	**Description:** White compacted powdery material			
	Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
	Calcareous particles, Binder/Filler	Cellulose	<1%	**None Detected ND**

Sampled by: Client
Analyzed by: Jason J. Stuhr **Date:** 07/15/2015
Reviewed by: Nick Ly **Date:** 07/15/2015

Nick Ly, Laboratory Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: Port of Seattle - PCS
Address: AOB 5th Floor Seattle-Tacoma International Airport, P.O. Box 68727 Seattle, WA 98168
Attention: Mr. Brian Nichols
Project Location: Project ID: 105198 Activity: PCSRMM2

Batch #: 1512733.00
Client Project #: Contract S-00317456
Date Received: 7/14/2015
Samples Received: 15
Samples Analyzed: 15
Method: EPA/600/R-93/116 & EPA/600/M4-82-020

Layer 2 of 3	**Description:** White compacted powdery material with paper			
	Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
	Calcareous particles, Binder/Filler	Cellulose	53%	**None Detected ND**
Layer 3 of 3	**Description:** White chalky material with paper			
	Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
	Gypsum/Binder, Fine particles	Cellulose	42%	**None Detected ND**
		Glass fibers	<1%	

Lab ID: 15070076 **Client Sample #: C-A21**
Location: Project ID: 105198 Activity: PCSRMM2

Layer 1 of 3	**Description:** White compacted powdery material			
	Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
	Calcareous particles, Binder/Filler	Cellulose	2%	**None Detected ND**
Layer 2 of 3	**Description:** White compacted powdery material with paper			
	Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
	Calcareous particles, Binder/Filler	Cellulose	57%	**None Detected ND**
Layer 3 of 3	**Description:** White chalky material with paper			
	Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
	Gypsum/Binder, Fine particles	Cellulose	17%	**None Detected ND**
		Glass fibers	2%	

Lab ID: 15070077 **Client Sample #: C-A22**
Location: Project ID: 105198 Activity: PCSRMM2

Layer 1 of 2	**Description:** Gray rubbery material			
	Non-Fibrous Materials:	Other Fibrous Materials:%		**Asbestos Type: %**
	Rubber/Binder, Fine grains	Cellulose	<1%	**None Detected ND**

Sampled by: Client
Analyzed by: Jason J. Stuhr **Date:** 07/15/2015
Reviewed by: Nick Ly **Date:** 07/15/2015

Nick Ly, Laboratory Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: Port of Seattle - PCS
Address: AOB 5th Floor Seattle-Tacoma International Airport, P.O. Box 68727 Seattle, WA 98168
Attention: Mr. Brian Nichols
Project Location: Project ID: 105198 Activity: PCSRMM2

Batch #: 1512733.00
Client Project #: Contract S-00317456
Date Received: 7/14/2015
Samples Received: 15
Samples Analyzed: 15
Method: EPA/600/R-93/116 & EPA/600/M4-82-020

Layer 2 of 2 **Description:** White soft mastic

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Mastic/Binder	Cellulose 2%	**None Detected ND**

Lab ID: 15070078 **Client Sample #: B-A01**
Location: Project ID: 105198 Activity: PCSRMM2

Layer 1 of 1 **Description:** Gray crumbly foamy fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Synthetic foam, Fine particles	Cellulose 59%	**None Detected ND**

Lab ID: 15070079 **Client Sample #: B-A02**
Location: Project ID: 105198 Activity: PCSRMM2

Layer 1 of 1 **Description:** Gray crumbly foamy fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Synthetic foam, Fine particles	Cellulose 60%	**None Detected ND**

Lab ID: 15070080 **Client Sample #: B-A03**
Location: Project ID: 105198 Activity: PCSRMM2

Layer 1 of 1 **Description:** Gray crumbly foamy fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Synthetic foam, Fine particles	Cellulose 54%	**None Detected ND**

Lab ID: 15070081 **Client Sample #: B-A04**
Location: Project ID: 105198 Activity: PCSRMM2

Layer 1 of 1 **Description:** Gray crumbly foamy fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Synthetic foam, Fine particles	Cellulose 57%	**None Detected ND**
	Glass fibers <1%	

Sampled by: Client
Analyzed by: Jason J. Stuhr **Date:** 07/15/2015
Reviewed by: Nick Ly **Date:** 07/15/2015

Nick Ly, Laboratory Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: Port of Seattle - PCS
Address: AOB 5th Floor Seattle-Tacoma International Airport, P.O. Box 68727 Seattle, WA 98168
Attention: Mr. Brian Nichols
Project Location: Project ID: 105198 Activity: PCSRMM2

Batch #: 1512733.00
Client Project #: Contract S-00317456
Date Received: 7/14/2015
Samples Received: 15
Samples Analyzed: 15
Method: EPA/600/R-93/116 & EPA/600/M4-82-020

Lab ID: 15070082 **Client Sample #: B-A05**
Location: Project ID: 105198 Activity: PCSRMM2

Layer 1 of 1 **Description:** Gray crumbly foamy fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Synthetic foam, Fine particles	Cellulose 60%	**None Detected ND**

Lab ID: 15070083 **Client Sample #: B-A06**
Location: Project ID: 105198 Activity: PCSRMM2

Layer 1 of 1 **Description:** Gray crumbly foamy fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Synthetic foam, Fine particles	Cellulose 62%	**None Detected ND**

Lab ID: 15070084 **Client Sample #: B-A07**
Location: Project ID: 105198 Activity: PCSRMM2

Layer 1 of 1 **Description:** Gray crumbly foamy fibrous material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Synthetic foam, Fine particles	Cellulose 59%	**None Detected ND**
	Glass fibers <1%	

Lab ID: 15070085 **Client Sample #: B-A08**
Location: Project ID: 105198 Activity: PCSRMM2

Layer 1 of 1 **Description:** Gray compressed fibrous material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Perlite, Paint	Cellulose 45%	**None Detected ND**
Miscellaneous particles	Glass fibers 32%	

Lab ID: 15070086 **Client Sample #: B-A09**
Location: Project ID: 105198 Activity: PCSRMM2

Sampled by: Client
Analyzed by: Jason J. Stuhr **Date:** 07/15/2015
Reviewed by: Nick Ly **Date:** 07/15/2015

Nick Ly, Laboratory Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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Bulk Asbestos Fibers Analysis

By Polarized Light Microscopy

Client: Port of Seattle - PCS
Address: AOB 5th Floor Seattle-Tacoma International Airport, P.O. Box 68727 Seattle, WA 98168
Attention: Mr. Brian Nichols
Project Location: Project ID: 105198 Activity: PCSRMM2

Batch #: 1512733.00
Client Project #: Contract S-00317456
Date Received: 7/14/2015
Samples Received: 15
Samples Analyzed: 15
Method: EPA/600/R-93/116 & EPA/600/M4-82-020

Layer 1 of 1 **Description:** Gray compressed fibrous material with paint

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Binder/Filler, Perlite, Paint	Cellulose 43%	**None Detected ND**
Miscellaneous particles	Glass fibers 29%	

Lab ID: 15070087 **Client Sample #: B-A10**
Location: Project ID: 105198 Activity: PCSRMM2

Layer 1 of 2 **Description:** White thick compacted powdery material

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Calcareous particles, Binder/Filler	Cellulose <1%	**None Detected ND**

Layer 2 of 2 **Description:** White chalky material with paper

Non-Fibrous Materials:	Other Fibrous Materials:%	**Asbestos Type: %**
Gypsum/Binder, Fine particles	Cellulose 18%	**None Detected ND**
	Glass fibers 2%	

Sampled by: Client
Analyzed by: Jason J. Stuhr **Date:** 07/15/2015
Reviewed by: Nick Ly **Date:** 07/15/2015

Nick Ly, Laboratory Technical Director

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government

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ASBESTOS LABORATORY SERVICES

Company Port of Seattle - PCS
Address AOB 5th Floor Seattle-Tacoma International Airport, P.O. Box 68727
Project Manager Mr. Brian Nichols
Phone (206) 787-5390

NVL Batch Number 1512733.00
TAT 4 Hrs **AH** No
Rush TAT
Due Date 7/15/2015 **Time** 10:55 AM
Email nichols.b@portseattle.org
Fax (206) 787-5198

Project Name/Number: Contract S -00317456 **Project Location:** Project ID: 105198 Activity: PCSRMM2

Subcategory PLM Bulk
Item Code ASB-02 EPA 600/R-93-116 Asbestos by PLM <bulk>

Total Number of Samples 15 Rush Samples

	Lab ID	Sample ID	Description	A/R
1	15070073	C-A18		A
2	15070074	C-A19		A
3	15070075	C-A20		A
4	15070076	C-A21		A
5	15070077	C-A22		A
6	15070078	B-A01		A
7	15070079	B-A02		A
8	15070080	B-A03		A
9	15070081	B-A04		A
10	15070082	B-A05		A
11	15070083	B-A06		A
12	15070084	B-A07		A
13	15070085	B-A08		A
14	15070086	B-A09		A
15	15070087	B-A10		A

	Print Name	Signature	Company	Date	Time
Sampled by	Client				
Relinquished by	Client				

Office Use Only	Print Name	Signature	Company	Date	Time
Received by	Jason J. Stuhr		NVL	7/14/15	1525
Analyzed by	Jason J. Stuhr		NVL	7/15/15	8:52 PM
Results Called by					
☐ **Faxed** ☐ **Emailed**					

Special Instructions: See Clients COC for Reporting Instructions

Date: 7/14/2015
Time: 3:41 PM
Entered By: Jason J. Stuhr

1512733

NVL LABS
INDUSTRIAL HYGIENE SERVICES
Laboratory | Management | Training

ASBESTOS CHAIN OF CUSTODY

Turn Around Time
- ❑ 1 Hour
- ❑ 2 Hours
- ☒ 4 Hours
- ❑ 24 Hours
- ❑ 2 Days
- ❑ 3 Days
- ❑ 4 Days
- ❑ 5 Days
- ❑ 10 Days

Please call for TAT less than 24 Hours

Company: Port Construction Services
Address: Seattle-Tacoma International Airport
AOB, 5th Floor
Phone: (206) 787-7903

Project Manager: Brian Nichols
Cell: (206) 245 - 8446
Email: Nichols.B@portseattle.org
Fax: ( ) -

Project Name/Number: Contract: S-00317456
Project Location: Project ID: 105198 / Activity: PCSRMM2

- ❑ PCM Air (NIOSH 7400)
- ☑ PLM (EPA 600/R-93-116)
- ❑ PLM Gravimetry (600/R-93-116)
- ❑ Asbestos Friable/Non-Friable (EPA 600/R-93/116)
- ❑ TEM (NIOSH 7402)
- ❑ EPA 400 Points (600/R-93-116)
- ❑ Asbestos in Vermiculite (EPA 600/R-04/004)
- ❑ TEM (AHERA)
- ❑ Other
- ❑ TEM (EPA Level II Modified)
- ❑ EPA 1000Points (600/R-93-116)
- ❑ Asbestos in Sediment (EPA 1900 Points)

Reporting Instructions: Email
❑ Call ( ) - ❑ Fax ( ) - ❑ Email

Total Number of Samples 15

	Sample ID	Description	A/R
1	C-A18		
2	C-A19		
3	C-A20		
4	C-A21		
5	C-A22		
6	B-A01		
7	B-A02		
8	B-A03		
9	B-A04		
10	B-A05		
11	B-A06		
12	B-A07		
13	B-A08		
14	B-A09		
15	B-A10		

	Print Name	Signature	Company	Date	Time
Sampled by	Brian Nichols		PCS	7/14/2015	3pm
Relinquish by	Brian Nichols		PCS	7/14/2015	3:25pm

Office Use Only

	Print Name	Signature	Company	Date	Time
Received by	Jason Stahler		NVL	7-14-15	15:25
Analyzed by					
Called by					
Faxed/Email by					

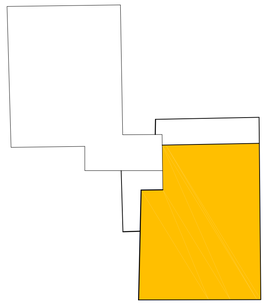
Port of Seattle

Roof Index Plan

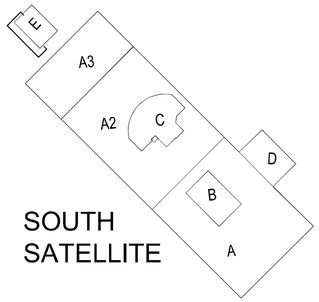
IWTP

SEATAC PASSENGER TERMINAL

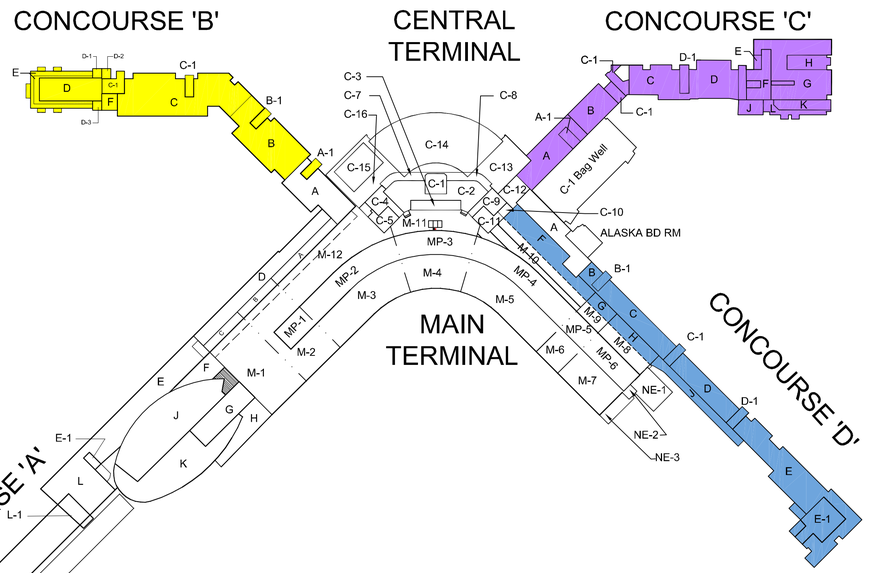
NOT PORT MAINTAINED

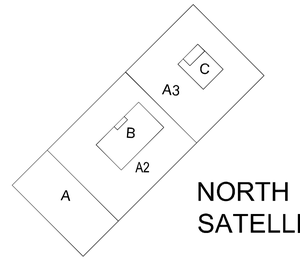


ALASKA HANGAR ONE



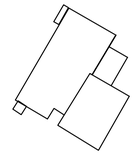
SOUTH SATELLITE



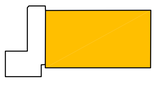


NORTH SATELLITE

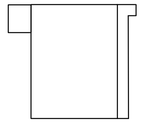
CARGO BUILDING



FIRE STATION



FREIGHT FACILITY



AIR CARGO IV

MAJOR ROOF AREAS	SQUARE FOOT
Concourse - A	201,550
Concourse - B	86,377
Concourse - C	82,112
Concourse - D	70,100
North Satellite	86,200
South Satelite	91,566
Main Terminal	192,145
Air Cargo IV	76,348
Alaska Hanger One	69,022
Central Terminal	51,340
IWTP	5,948
C-1 Bag Well	46,130
Delta Freight Facility	34,820
Fire Station	28,789

AREA	Year Installed	System Type
Concourse 'B'-All & Concourse 'C' - All	1991	1
Concourse 'D' Section B Thru E, I & Penthouses	1991	1
Main Terminal: M-9 & Penthouses: MP-1,MP-4&5.	1993	2
Concourse 'D' - Sections F & G	1994	3
North Satellite-All & Concourse 'D' Section H	1995	4
Main Terminal: M-3,M4,M8 & Penthouse MP-6	1996	5
Alaska Board Room- All & North Esplande (NE-1 & NE-2)	2003	6
Concourse 'A'; STEP- All	2004	7
South Satellite; Sections A, A2,A3,B & D	2005	8
Central Terminal: C-12,C-13,C-14,C-15,C-16	2006	9
C-1 Bag Well- All	2006	10
Air Cargo Four - All	2006	11
British Air Lounge South Satellite Section C	2007	12
Central Terminal: C-2 Thru C-11 & Concourse 'D' Section A	2008	13
Delta Ware House - All	1980	BUR
IWTP - All	1992	coal tar pitch
Alaska Hanger One - All	1980	Mtl. & SPM
Fire Station - All	2012	15
Seattle Christian School	2000	SPM
MAIN TERMINAL: M-1, M-2, M-10, M-12 & PENTHOUSE: MP-2, MP-3	2011	14

BUR- Built-up Asphalt Roofing

SPM- Single Ply Elastomeric Membrane Roofing

SYSTEMS TYPES

1. 45 mil "Trocal" PVC mechanically attached over light weight insulation fill over 22 GA. metal deck installed by Snyder Roofing completed in 1991, 10 year warranty.
2. 65 mil "Genflex" PVC fully adhered over 3" rigid insuation over lt. wt. insulating fill over 22 GA. mtl. deck installed by Snyder roofing in 1993, 15 year warranty.
3. Same as #2 installed by South End Roofing in 1994. 15 year warranty.
4. Same as #2, install by Snyder Roofing in 1995, 15 year warranty.
5. 65 mil "Sarnafil" PVC installed same as #2. installed by Waynes Roofing in 1996, 15 year warranty.
6. 65 mil "Sarnafil" PVC fully adhered over tapered insul.over a 22 GA. mtl. deck installed by Queen City in 2003, 15 year warranty.
7. 65 mil "John Mansville" PVC fully adhered over tapered rigid insul. over 22 GA. mtl. deck. and/or structural concrete installed by Wayne's roofing in 2004, 15 year warranty.
8. 65 mil "John Mansville" PVC fully adhered over rigid insul. over lt.wt. insulating fill over 22 GA. mtl. deck. installed by Wayne's roofing in 2005, 15 year warranty.
9. 65 mil "John Mansville" PVC fully adhered over tapered rigid insul. over 22 GA. mtl. deck. and/or structural conc. installed by Wayne's roofing in 2006, 15 year warranty.
10. 65 mil "John Mansville" PVC fully adhered over tapered rigid insul. over 22 GA. mtl. deck. installed by Waynes roofing. in 2006, 15 year warranty.
11. 65 mil "John Manville" PVC mechanically attached over rigid insul. over 22 GA. mtl. deck. installed by CIR roofing. in 2006, 15 year warranty.
12. 65 mil"Sarnafil" PVC fully adhered over tapered rigid insul. over lt. wt. concrete, over 22 GA. mtl deck.installed by Acces Roofing in 2007, 15 year warranty.
13. 65 mil "John Mansville" PVC fully adhered over tapered rigid insul. over structural concrete & Lt.Wt. insul. fill installed by SQI Roofing. in 2008, 15 year warranty.
14. 60 Mil "John Manville" PFC fully adhered over 1/4" protection over 5" insulation over light wt. insulating fill over 22 Ga. mtl. deck installed by Cobra Roofing in 2011, 15 year warranty.
15. 60 mil "Sarnifil" PVC fully adhered over 1/4" protection Bd. (Dens Deck) over 5" rigid insulation over 22 guage mtl. deck. Installed by Queen City in 2012.

N

Index to Color Coding

- Areas to be Reroofed in----------2014
- Areas to be Reroofed in----------2015
- Areas to be Reroofed in----------2016
- Areas to be Reroofed in----------2017

PROJECT ENGR./ARCH: BOB MARUSKA
DESIGNER: RICK WRIGHT
DRAWN BY: TIM BRENNAN
SCALE:
DATE:
CHECKED BY:
CHECKED/APPROVED BY:

REVISIONS

NO.	DATE	BY	DESCRIPTION	APP'D	NO.	DATE	BY	DESCRIPTION	APP'D

PROJECT MANAGER: PENNE PELTON
PROJECT ENGINEER:
DESIGN ENGINEER:
DRAFTER:
SCALE:
DATE:
CHECKED/APPROVED BY:

Port of Seattle SEA-TAC INTERNATIONAL AIRPORT

PROJECT: 2014 CONCOURSE - D ROOF REPLACEMENT PROJECT

SHEET TITLE: ROOF INDEX PLAN FOR REFERENCE ONLY

WORK PROJECT NO. U00026
CONSULTANT'S NO.
PORT OF SEATTLE NO. STIA-1408 G-4

Port of Seattle

Safety Data Sheets

Sika-Trocal Roofing

Mechanically Fixed Single Ply Roofing Membranes

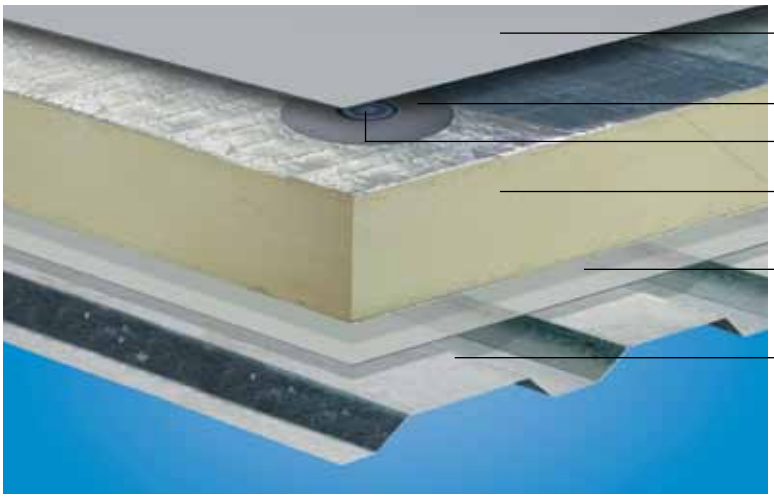
Type S

Sika®

Sika-Trocal®

Mechanically Fixed Single Ply Roofing Membranes

Sika-Trocal Type S



For further technical information on Sika-Trocal products, please refer to the product datasheets available to download from www.sikatrocal.co.uk

Sika-Trocal S is a homogenous, synthetic roof waterproofing sheet based on premium-quality polyvinyl chloride (PVC).

Sika-Trocal Type S membranes are suitable for mechanically fastened roof systems in both new build and refurbishment applications. Using the unique Sika-Trocal Laminated Metal Discs and a thermally broken fastener they provide a rapid and economic roofing solution by securing both the membrane and the insulation in one go, reducing the fasteners required for a project by 40-60% and speeding up installation. Most other single ply systems use a separate fastening system for each component.

The wide range of fasteners now available means that it is possible to mechanically fix an exposed Sika-Trocal membrane to virtually any type of deck. The number of fasteners required to secure the membrane and insulation in place is determined by calculation of the size and location of the various zones of influence of wind loading upon each individual roof. To generate these calculations Sika-Trocal provides its Licensed Contractors with access to Internet based calculation software, enabling them to work out the optimum number of fasteners required to secure the roof against wind loads on a project by project basis; avoiding 'rules of thumb' or guess work.

Characteristics and Advantages

- BBA Certification with a life expectancy durability statement 'in excess of 30 years'
- Outstanding resistance to weathering, including UV irradiation
- Rapid and simple installation
- Simplicity of Detail - Trocal Metal used at all perimeters and changes of direction or plane ensuring that a crisp, simple detail is achieved
- Excellent weldability
- Homogenous
- Recyclable
- CE marking according to EN 13984
- Quality management system EN ISO 9001/14001
- Resistant to all common environmental influences
- Flexible in cold temperatures
- High water vapour permeability

Accessories

To assist specifiers and contractors in meeting the technical and aesthetic demands of each project, Sika-Trocal offers a range of accessories.

- Vapour Control Layers
- Adhesives
- Fasteners
- Levelling/Separation Layers
- Protection Sheets
- Walkways
- Sealants
- Aesthetic Profiles
- Preformed Details
- Rainwater Outlets and associated accessories
- Rooflights
- Lightning Conductor Clips

Performance standards are set for accessories that are not supplied by Sika-Trocal, our policy is to ensure that strategic partners meet our stringent criteria and provide quality products and support services for our Licensed Contractors.

NBS specifications using the *SikaSpec* Specification Tool

SikaSpec provides a fast, simple and efficient way to create specifications online. By following eight simple steps, SikaSpec enables you to specify each element of the roof construction through a simple step by step process, with each stage offering you a range of options to guide you through the selection process.

Where the roofing components are not supplied by Sika-Trocal, there is an option to specify a generic solution, or select a preferred 'equal or approved' supplier. SikaSpec will even allow you to specify up to three different roof areas on the same building.

At the end of the process, you will receive an electronic Sika specification document and where required an NBS document. Once registered all specifications will be saved in your own account enabling you to repeatedly access and modify specifications as often as you require.

Bespoke Specifications

Where a more complex specification is required a Sika-Trocal Area Technical Manager is available to assist in the creation of a bespoke specification, contact our enquiry line for further assistance on **01707 394444.**

Sika-Trocal Licensed Contractors

To help achieve zero defects on site Sika-Trocal membranes are only supplied to Sika-Trocal Licensed Contractors. Each of these companies is a specialist roofing sub contractor who has had their employees trained in the design, estimation, procurement and installation of Sika-Trocal membranes.

Covering the entire UK mainland the Sika-Trocal network of Licensed Contractors can provide a complete supply and installation package, including the deck, vapour control layer, insulation and appropriate Sika-Trocal membrane, for anything from a small works package to a multi-million pound contract.

Sika-Trocal Installation Inspections

The Sika Roofing Applications Department consists of 11 Roofing Field Technicians each with a minimum of five years installation experience.

The Field Technicians are responsible for monitoring the progress of a project and carrying out guarantee inspections.

www.sikaspec.co.uk

Sika-Trocal®

Sika Full Range Solutions for Construction

Concrete Production

Sika® ViscoCrete®
Sika® Retarder®
Sika® SikaAer®

Waterproofing

Sikaplan®, Sikalastic®
Sika® & Tricosal® Waterstops
Sika® Injection Systems

Flooring

Sikafloor®
SikaBond®

Corrosion and Fire Protection

SikaCor®
Sika® Unitherm®

Concrete Repair and Protection

Sika® MonoTop®
Sikagard®
Sikadur®

Structural Strengthening

Sika® CarboDur®
SikaWrap®
Sikadur®

Joint Sealing

Sikaflex®
Sikasil®

Grouting

Sikadur®
SikaGrout®

Roofing

Type S Mechanically Fixed, Type SGK Adhered, Type SGmA Green, Ballasted and Solar Roofs

Our most current General Sales Conditions shall apply.
Please consult the Product Data Sheet prior to any use and processing.

Sika Limited, Sika-Trocal Roofing Division, Watchmead, Welwyn Garden City, Herts, AL7 1BQ
Tel: 01707 394444, Fax: 01707 329129, www.sikatrocal.co.uk

Sika-Trocal®

Sika-Trocal® S 1.5 mm

Polymeric membrane for roof waterproofing

Roofing

Product Description	Sika-Trocal® S 1.5 mm is a homogeneous, multi-layer, synthetic roof waterproofing sheet based on premium-quality polyvinyl chloride (PVC) according to EN 13956.
Uses	Roof waterproofing membrane for exposed flat roofs: ■ Loose laid and mechanically fastened
Characteristics / Advantages	■ Outstanding resistance to weathering, including permanent UV irradiation ■ High resistance to ageing ■ High resistance to hailstones ■ Resistant to all common environmental influences ■ High resistance to mechanical influences ■ High tensile strength and elongation ■ Excellent flexibility in cold temperatures ■ High water vapour permeability ■ Outstanding weldability ■ Recyclable
Approval / Standards	■ Polymeric sheets for roof waterproofing according to EN 13956, certified by notified body 1213-CPD-4125/4127 and provided with the CE-mark. ■ Reaction to fire according to EN 13501-1. ■ External fire performance tested according to ENV 1187 and classified according to EN 13501-5: BROOF(t1). ■ Fire behaviour conforms in accordance with DIN 4102/part 1. ■ Resistant to sparks and radiant heat in accordance with 4102/part 7. ■ Official Quality Approvals and Agrement Certificates and approvals. ■ Monitoring and assessment by approved laboratories. ■ Quality Management system in accordance with EN ISO 9001/14001. ■ Production according to responsible Care Policy of Chemical Industry.

Appearance / Colours	Surface:	smooth
	Colours:	
	Top surface:	light grey (nearest RAL 7047) slate grey (nearest RAL 7015))
	Bottom surface:	dark grey
	Top surface of sheet in other colours available on request, subject to minimum order quantities.	
Packaging	Packing unit:	12 rolls per pallet
	Roll length:	20.00 m 15.00 m
	Roll width:	1.10 m 2.00 m
	Roll weight:	41.80 kg 57.00 kg
Storage Conditions / Shelf-Life	Rolls must be stored in a horizontal position on pallet and protected from direct sunlight, rain and snow. Product does not expire during correct storage.	

Technical Data

Product Declaration	EN 13956: 2005	
Visible defects	Pass	EN 1850-2
Length	25.00 m, 20.00 m, 15.00 m (- 0 % / + 5 %)	EN 1848-2
Width	0.60 m, 1.10 m, 2.00 m (- 0.5 % / + 1 %)	EN 1848-2
Straightness	≤ 30 mm	EN 1848-2
Flatness	≤ 10 mm	EN 1848-2
Effective thickness	1.5 mm (- 5 % / + 10 %)	EN 1849-2
Mass per unit area	1.9 kg/m² (- 5 % / + 10 %)	EN 1849-2
Water tightness	Pass	EN 1928
Effects of liquid chemicals, including water	On request	EN 1847
External fire performance Part 1-4	B_{ROOf}(t1) <20°/>20°	EN 13501-5
Reaction to fire	Class E	EN ISO 11925-2, classification to EN 13501-1
Hail resistance		EN 13583
rigid substrate	≥ 18 m/s	
flexible substrate	≥ 30 m/s	
Joint peel resistance	≥ 300 N/50 mm	EN 12316-2
Joint shear resistance	≥ 500 N/50 mm	EN 12317-2
Water vapour transmission properties	μ = 20'000	EN 1931
Tensile stress		EN 12311-2
longitudinal (md)[1)]	≥ 12 N/mm²	
transversal (cmd)[2)]	≥ 12 N/mm²	
Elongation		EN 12311-2
longitudinal (md)[1)]	≥ 250 %	
transversal (cmd)[2)]	≥ 250 %	
Resistance to impact		EN 12691
hard substrate	≥ 400 mm	
soft substrate	≥ 700 mm	
Tear strength		EN 12310-2
longitudinal (md)[1)]	≥ 100 N	
transversal (cmd)[2)]	≥ 100 N	
Dimension stability		EN 1107-2
longitudinal (md)[1)]	≤ |2.0| %	
transversal (cmd)[2)]	≤ |2.0| %	
Foldability at low temperature	≤ -25 °C	EN 495-5
UV exposure	Pass (> 5'000 h)	EN 1297

[1)] md = machine direction
[2)] cmd = cross machine direction

System Information

System Structure

Ancillary products according to local price list:

- Sika-Trocal® S 1.5 mm un-reinforced sheet for detailing
- Moulded corner pieces, prefabricated corners and pipe flashings
- Sika-Trocal® Metal Sheet Type S
- Sika-Trocal® Cleaner L 100
- Sika-Trocal® Welding Agent
- Sika-Trocal® Seam Sealant
- Sika-Trocal® C 733 (Contact adhesive)

Application Details

Substrate Quality

The substrate surface must be uniform, smooth and free of any sharp protrusions or burrs, etc.

Sika-Trocal® S 1.5 mm must be separated from any incompatible substrates by an effective separation layer to prevent accelerated ageing. Prevent direct contact with bitumen, tar, fat, oil, solvent containing materials and other plastic materials, e.g. expanded polystyrene (EPS), extruded polystyrene (XPS), polyurethane (PUR), polyisocyanurate (PIR) or phenolic foam (PF) as this could adversely affect the product properties.

Application Conditions / Limits

Temperature

The use of Sika-Trocal® S 1.5 mm membrane is limited to geographical locations with average monthly minimum temperatures of -10 °C.
Permanent ambient temperature during use is limited to +50 °C.

Compatibility

Not compatible with direct contact to other plastics, e.g. EPS, XPS, PUR, PIR, PF.
Not resistant to tar, bitumen, oil and solvent containing materials.

Installation Instructions

Installation Method / Tools

Installation procedure:
According to the valid installation instructions of manufacturer for Sika-Trocal® S - types for mechanically fastened roofs.

Fixing Method:
Loosely laid and mechanically fastened.
The roof waterproofing sheet is installed by loose laying and mechanical fastening in seam overlaps or independent from overlaps with the Sika-Trocal® disc system.

Welding Method:
Overlap seams are welded by electric hot welding equipment suitable for homogeneous membranes, such as manual hot air welding machines and pressure rollers or automatic hot air welding machines with controlled hot air temperature capability

Welding parameters including temperature, machine speed, air flow, pressure and machine settings must be evaluated, adapted and checked on site according to the type of equipment and the climatic situation prior to welding. The effective width of welded overlaps should be minimum 20 mm.

If local weather conditions allow cold welding of sheet overlaps with Sika-Trocal® Welding Agent, it is permitted for Trocal® S 1.5 mm with mechanically fastened system in overlap or independent from seam. The effective width of welded overlaps by cold welding should be minimum 30 mm.

The seams must be mechanically tested with screw driver or steel needle to ensure the integrity/completion of the weld. Any imperfections must be rectified by hot air welding.

Cold welding of sheet overlaps with Sika-Trocal® Welding Agent is permitted for small repair work within application limits.

Edges must be sealed with Sika-Trocal® Seam Sealant.

Roofing

Notes on Installation / Limits	Installation works must be carried out only by Sika instructed contractors for roofing. Temperature limits for the installation of the membrane: Substrate temperature: -10 °C min. / +60 °C max. for hot air welding +5 °C min. / +60 °C max. for cold welding Ambient temperature: -5 °C min. / +60 °C max. for hot air welding +5 °C min. / +60 °C max. for cold welding Installation of some ancillary products, e.g. contact adhesives/thinners is limited to temperatures above +5 °C. Please refer to the respective Product Data Sheets. Special measures may be compulsory for installation below +5 °C ambient temperature due to safety requirements in accordance with national regulations
Value Base	All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.
Local Restrictions	Please note that as a result of specific local regulations the performance of this product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the application fields.
Ecology, Health and Safety Information	The product does not fall within the EC-regulation of hazardous goods. As a result, a material safety data sheet following EC-Guideline 91/155 EWG is not needed to bring the product to the market, transport or use it. The product does not damage the environment when used as specified.
Protective Measures	Fresh air ventilation must be ensured, when working (welding) in closed rooms. Local safety regulations must be observed.
Transportation Class	The product is not classified as hazardous good for transport.
Disposal	The material is recyclable. Disposal must be according to local regulations. Please contact your local Sika sales organisation for more information.
Legal Note	The information, and, in particular, the recommendations relating to the application and end- use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the product's suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.

bsi. ISO 9001 Quality Management

bsi. ISO 14001 Environmental Management

bsi. OHSAS 18001 Occupational Health and Safety Management

SIKA LIMITED
Head Office · Watchmead · Welwyn Garden City
Hertfordshire · AL7 1BQ · United Kingdom
Phone: +44 1 707 394444 · Fax: +44 1 707 329129
www.sika.co.uk

Sika-Trocal®

Sika Sarnafil Inc.
100 Dan Road
Canton, MA 02021-2842

Sarnatherm

MSISFILE: STHERM ISO

PRINT DATE: 4/26/2007
REVISION DATE: 4/26/06

Material Safety Information Sheet

(According to 29 CFR 1910.1200(b)(6)(v) this material is an article. No labeling or MSDS reporting is required.)

SECTION 1 Product and Company Identification

TRADE NAME:	Sarnatherm	
SYNONYMS:	Polyiso Insulation	
MANUFACTURER:	Sika Sarnafil Inc.	
ADDRESS:	100 Dan Road, Canton, MA 02021-2842	
EMERGENCY NUMBERS:	CHEMTREC Transportation Emergency (24 hr.)	(800) 424-9300
	MSDS and Product Information (M-F, 8:30am-5:00pm EST)	(800) 451-2504

SECTION 2 Information on Hazardous Ingredients

This material is considered an article according to 29 CFR 1910.1200(b)(6)(v). An article is by definition a manufactured item other than a fluid or particle: (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities, e.g., minute or trace amounts of a hazardous chemical (as determined under paragraph (d) of this section), and does not pose a physical hazard or health risk to employees.

An MSDS is required only for chemicals in products that are hazardous as defined by the OSHA standard 29 CFR 1910.1200(g). This Material Safety Information Sheet is provided in lieu of a Material safety Data Sheet.

CHEMICAL/COMMON NAME	CAS NUMBER	PERCENT	OSHA-PEL	ACGIH-TLV
Polyisocyanurate foam	none	96 %	15 mg/M^3	10 mg/M^3
Pentane	109-66-0	2 %	TWA: 1000 ppm	TWA: 600 ppm
Fiberglass	65997-17-3	1 %	5 mg/M^3	10 mg/M^3
Carbon Black	1333-86-4	1 %	3.5 mg/M^3	3.5 mg/M^3

SECTION 3 Hazards Identification

EYES:	Mechanical irritation, redness, tearing may occur with exposure.
SKIN:	Prolonged skin contact may cause skin irritation.
INHALATION:	Dust will cause respiratory tract irritation.
INGESTION:	May cause gastrointestinal irritation, nausea, vomiting and diarrhea.
SYMPTOMS:	No long-term health effects are expected.

SECTION 4 First Aid Measures

EYES: Immediately flush eyes with plenty of water for at least 15 minutes. If irritation persists, seek medical attention.

SKIN: Wash skin with mild soap and plenty of water.

INHALATION: Move person to fresh air. If not breathing, give oxygen and seek medical attention immediately. Trained personnel should only administer oxygen.

INGESTION: If swallowed, rinse person's mouth thoroughly with water and seek medical attention. ONLY induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person.

SECTION 5 Fire Fighting Measures

FLASH POINT (F/ C)	LEL (volume %)	UEL (volume %)
670 F/ 354 C PMCC	N/A	N/A

Extinguishing Media: Dry chemical, carbon dioxide, and large volumes of water directly on flame and burning surface.

Fire Fighting Procedures: Wear a self-contained breathing apparatus in a sustained fire. Full protective bunker turnout gear should be used by fire fighting forces.

Unusual Hazards: Material produces dense black smoke while burning. Grinding, sawing, or fabrication activities can produce dust particles, which may under certain conditions form explosive dust atmospheres that can be ignited.

Combustion Products: May form carbon dioxide, carbon monoxide, hydrogen bromide/chloride/fluoride, aromatic hydrocarbons (styrene & ethylbenzene).

SECTION 6 Accidental Release Measures

Use normal cleanup procedure for solid materials.

SECTION 7 Handling and Storage

Store material away from heat and flame.

SECTION 8 Exposure Controls / Personal Protection

Engineering Controls: Mechanical ventilation may be necessary if working with the product in enclosed areas due to high dust levels from grinding, sawing, or fabrication activities.

Personal Protective Equipment:

EYES: Safety glasses. Consult your safety representative.

SKIN: N/A

RESPIRATORY: NIOSH approved disposable dust respirator is recommended when high dust levels are encountered. Use respiratory protection in accordance with your company's respiratory protection program, local regulations, and OSHA 29 CFR 1910.134

SECTION 8 Exposure Controls / Personal Protection, Continued. . .

Exposure Guidelines:

CHEMICAL	OSHA PEL	ACGIH TLV
Polystyrene	not listed	not listed
1,1,1 Chlorodifluoroethane HFC-142b	not listed	not listed
Hexabromocyclododecane	not listed	not listed

PEL = Permissible Exposure Limits
TLV = Threshold Limit Value

TWA = Time Weighted Average (8 hr.)
STEL = Short Term Exposure Limit (15 min.)

SECTION 9 Physical and Chemical Properties

APPEARANCE	Rigid Cellular Foam Board
ODOR:	No odor
BOILING POINT (@ 760 mm Hg):	N/A
SPECIFIC GRAVITY :	0.027 to 0.064
LIQUID DENSITY:	N/A
SOLUBILITY IN WATER:	Insoluble
% VOLATILE VOLUME:	N/A
EVAPORATION RATE (N-Butyl Acetate=1):	N/A
VAPOR PRESSURE (mm Hg):	N/A
VAPOR DENSITY (air=1):	N/A

SECTION 10 Stability and Reactivity

CONDITIONS TO AVOID:

Excessive dust particles may under certain condition form explosive atmospheres that can be ignited. Avoid high temperatures >482 F/250C

INCOMPATABILITY WITH OTHER MATERIALS:

Avoid aromatic hydrocarbons, high aliphatic hydrocarbons, esters, amines, and higher aldehydes.

HAZARDOUS DECOMPOSITION PRODUCTS:

May form carbon dioxide, carbon monoxide, hydrogen bromide/chloride/fluoride, aromatic hydrocarbons (styrene & ethylbenzene).

HAZARDOUS POLYMERIZATION:

Will NOT undergo hazardous polymerization.

SECTION 11 Toxicological Information

Toxicological information is not available.

SECTION 12 Ecological Information

Ecological information is not available.

SECTION 13 Disposal Considerations

This polystyrene foam plastic is recyclable. If recycling is not an option, bury in approved landfill or burn in an adequate incinerator with excess oxygen. Dispose in accordance with applicable Federal, State, and Local regulations.

SECTION 14 Transportation Information

D.O.T. Primary Hazard Label:	Not Regulated
D.O.T. Hazard Class:	Not Regulated
D.O.T. Identification Number (UN/NA):	None Required
D.O.T. Packing Group:	Not Regulated

SECTION 15 Regulatory Information

U.S. Federal Regulations

SARA Title III, Section 302:

This product is NOT regulated under SARA Title III, Section 302 Extremely Hazardous Substances (40 CFR Part 355).

SARA Title III, Section 313:

This product does NOT contain toxic chemicals subject to the reporting requirements of SARA Title III, Section 313 (40 CFR 372) of the Emergency Planning and Community Right-To-Know Act of 1986.

State Regulations

CALIFORNIA SAFE DRINKING ACT (PROP 65 for Carcinogen and Teratogen):

This product does NOT contain any chemicals currently on the California List of Known Carcinogens and Reproductive Toxins.

SECTION 16 Other Information

	HMIS	NFPA
HEALTH:	**0**	**N/A**
FLAMMABILITY:	**1**	**1**
REACTIVITY:	**0**	**0**
PERSONAL PROTECTION:	**0**	**N/A**

Sika Sarnafil Inc. Disclaimer of Expressed and Implied Warranties

The information in this Material Safety Information Sheet is offered in good faith as accurate at the date of issuance. No warranty of merchantability, fitness for any particular purpose, or any other warranty is expressed or is to be implied regarding the accuracy or completeness of this information, the safety of this product, or the hazards related to its use. This information and product are furnished on the condition that the person receiving it shall make their own determination as to the suitability of the product for their particular purpose and on the condition that they assume the risk of use thereof. Compliance with all applicable Federal, State, and Local laws and regulations remains the responsibility of the user.