SoundEarth Strategies, Inc.
2811 Fairview Avenue East, Suite 2000
Seattle, Washington 98102

April 8, 2015

Mr. Tom Lee
Madison Development Group, LLC
10510 Northeast Northup Way, Suite 120
Kirkland, Washington 98033

SUBJECT: VAPOR INTRUSION STUDY
Smokey Point Retail Center (VCP#NW2833)
2707 171st Place Northeast
Marysville, Washington
Project Number: 0918-001-07

Dear Mr. Lee:

SoundEarth Strategies, Inc. (SoundEarth) has prepared this letter report to present the results of the indoor air sampling events conducted at the property located at 2707 171st Place Northeast in Marysville, Washington (Smokey Point Property). The indoor air sampling event was conducted by SoundEarth in accordance with our scope of work dated November 14, 2014, and in accordance with Washington State Department of Ecology's (Ecology) draft *Guidance for Evaluating Soil Vapor Intrusion in Washington State* (2010 Ecology Vapor Intrusion Guidance).

The purpose of the vapor intrusion study is to determine if volatile petroleum hydrocarbons originating from the adjacent property (Source Property) are present in the indoor air of the building located in a downgradient location on the Property at 2804 172nd Street Northeast (Building #1; see Figure 1). Indoor air in a second building (Building #2) on the Smokey Point Property was not evaluated, as it is both crossgradient and further downgradient from the Source Property. Presented below is a discussion of project background, SoundEarth's field activates, analytical results, and our conclusions regarding vapor intrusion.

BACKGROUND

Smokey Point Chevron was built on the adjoining Source Property in 1978 and was operated by Denis and Mary Rogers until it was leased by Robert Ford from 1988 to 1992, and by Wayne Hoskins from 1992 to 2008. The Chevron station included three gasoline underground storage tanks (USTs) ranging in capacity from 5,000 to 12,000 gallons. Smokey Point Chevron operated until mid-2008. The Smokey Point Retail Center was constructed on the Smokey Point Property, located immediately to the south of the Chevron station on the Source Property, in 2008. The two properties are shown in relative position on Figure 2.

GeoScience Management, Inc. (GeoScience) prepared a letter report, *Groundwater Monitoring Event, April 2011, Former Smokey Point Chevron, 2804 - 172nd Street NE, Marysville, Washington*, dated May 7, 2011, that included results for groundwater sampling conducted at the Smokey Point Property and the

adjoining Source Property from September 2006 to September 2009. The results identified gasoline-range petroleum hydrocarbons (GRPH) and benzene, toluene, ethylbenzene, and total xylenes (BTEX)-impacted groundwater near the pump islands and USTs on the Source Property, and beneath the parking area on the north side of Building #1 on the Smokey Point Property. GRPH and BTEX concentrations exceeded Washington State Model Toxics Control Act (MTCA) Method A cleanup levels.

The three USTs were removed from the Source Property in October 2009. Petroleum-contaminated soil (PCS) was excavated to a reported depth of 6.5 to 7 feet below ground surface. Groundwater infiltrated the remedial excavation at a depth of 5.5 feet. Brown frothy material and sheens were observed on the surface of the excavation water and removed by skimmers, absorbents, and vacuum truck. A total of 1,767 tons of PCS and 4,900 gallons of excavation water were removed from the excavation. The remedial activities on the Source Property was managed and monitored by GeoScience.

A sidewall soil sample collected by GeoScience from the south side of the excavation (closest to the boundary of the Smokey Point Property) at a depth of 5 feet contained 22,000 milligrams per kilogram (mg/kg) GRPH, exceeding the MTCA cleanup level of 30 mg/kg. Three bottom samples collected at 5 feet from the excavation center and north end contained 1,210 mg/kg to 18,500 mg/kg GRPH.

Further lateral excavation was not conducted on the south sidewall due to presence of the Smokey Point Chevron building. PCS was, therefore, left beneath the Chevron building. In addition, PCS was likely left in-place at the base of the excavation - the cleanup report does not indicate any samples were collected deeper than 6 feet, and very few verification samples were collected from the bottom-center of the excavation. A PVC-pipe infiltration gallery was installed in the excavation prior to backfilling. However, no additional remediation has been conducted at the Source Property since 2009.

Groundwater quality at the Smokey Point Property has been monitored from 2006 to 2014. The most recent groundwater sampling and monitoring events at the Smokey Point Property in August 2014 showed that concentrations of GRPH and BTEX in groundwater samples collected from monitoring wells MW-112, MW-113, and MW-114 exceed applicable MTCA Method A cleanup levels. Concentrations of GRPH and BTEX in the remaining monitoring wells within the monitoring well network were below applicable MTCA cleanup levels and laboratory reporting limits.

Concentrations of GRPH and BTEX in the groundwater beneath the Smokey Point Property change by factors of up to 10 times in response to seasonal changes in the depth to groundwater. Figure 1 shows the location of monitoring well network beneath the Smokey Point Property. A summary of groundwater quality results are presented in the *Third Quarter 2014 Groundwater Monitoring Smokey Point Retail Center, 2707 171st Place Northeast Marysville, Washington*, prepared by SoundEarth and dated April 1, 2015.

BUILDINGS 1 AND 2 VAPOR BARRIERS

During the 2010 construction of Buildings #1 and #2 on the Smokey Point Property, a Stego Wrap Vapor Barrier (vapor barrier) was installed beneath the concrete slab-on-grade. The polyolefin-based vapor barrier is 15 mils thick and meets the requirements of American Society for Testing and Materials specification E1745 Class A vapor barrier (Attachment C). The vapor barrier is designed to control radon, methane, and petroleum byproduct gases. Photos documenting the installation of the vapor barrier

were taken by Geoscience and are attached to this report as Attachment D. The photos show that the vapor barrier was installed beneath the perimeter footings and under utility vaults prior to pouring the slab and that pipe penetrations and seams in the slab were taped with Stego tape. In addition, a layer of 10-mil plastic sheeting was installed over the vapor barrier. The vapor barriers beneath Buildings #1 and #2 prevent the potential intrusion of impacted subsurface vapors into interior spaces.

FIELD ACTIVITIES

On January 27 and February 19, 2015, SoundEarth performed a pre-sampling clearance effort and vapor sampling event at Building #1. A summary of field activities for both events is presented below.

Pre-Sampling Clearance Event

On January 27, 2015, SoundEarth conducted a pre-sampling clearance to identify known and possible sources of chemicals of concern in the west-half of Building #1 occupied by the Savvy Mattress. The pre-sample clearance followed Tier II Assessment protocols in accordance with the 2010 Ecology Vapor Intrusion Guidance. SoundEarth observed new mattresses in the Building #1, which may act as source for volatile organic vapor emitters. Small volumes of paints and miscellaneous housekeeping products were also present in Building #1. The paints and housekeeping products were not removed prior to sampling the indoor air inside Building #1 because of tenant requirements. The Building #1 Survey form is presented in the Attachment A.

Vapor Sampling Event

On February 19, 2015, SoundEarth collected one indoor ambient air sample from the northwest corner of Building #1 (Figure 2). An outdoor ambient air sample was also collected from the intake of the roof air exchange unit of Building #1 to represent local ambient air loads for volatile organics.

Equipment for each air sample consisted of a 6-liter Summa canister and a flow controller placed in line with the canister. The flow controller controls the air flow rate into the canister and the sampling period, 8 hours for the indoor air sample and 9 hours for the outdoor ambient air sample. The samples were collected from the hours of approximately 9 a.m. to 5 p.m. in Building 1 and the roof exchange on top of the building. During the sampling event the HVAC in the building was active. Air samples were analyzed for BTEX using U.S. Environmental Protection Agency Method TO-15. Air samples were shipped to Eurofins Air Toxics, Inc. laboratory in Folsom, California, under standard chain-of-custody protocols. Air sampling locations are shown on Figure 2, and analytical laboratory reports are included as Attachment B.

ANALYTICAL RESULTS

Analytical results for air samples are presented below. Results are summarized on Figure 1 and in Table 1. Laboratory analytical reports are presented in Attachment B. Indoor air results are as follows:

- BTEX constituents were detected in the indoor and outdoor air samples collected from the inside Building #1 and at the intake of the roof and the air exchange unit on Building 1.
- Concentrations of benzene in the indoor and outdoor ambient air samples collected from Building 1 were 1.0 micrograms per cubic meter ($\mu g/m^3$)and 0.85 $\mu g/m^3$, respectively (Figure 1; Table 1). When the benzene outdoor ambient air sample concentration is subtracted from the

benzene indoor air sample concentration, the indoor air concentration of benzene is 0.15 µg/m3, which below the MTCA Method B indoor air cleanup level (0.15 µg/m^3). The subtraction of the outdoor ambient air concentrations from the indoor air concentrations is in accordance with the 2010 Ecology Vapor Intrusion Guidance.

- Concentrations of toluene, ethylbenzene, and xylenes in the indoor and outdoor air samples were all less than their applicable MTCA Method B indoor air cleanup levels.

CONCLUSIONS

The concentrations of the gasoline related volatile constituents (BTEX) in the indoor air in Building #1 are less than applicable MTCA Method B indoor air cleanup levels when corrected for background outdoor ambient air concentrations as mandated by established protocol under the 2010 Ecology Vapor Intrusion Guidance when the building ventilation systems are operational during the sample collection period. Therefore, the measured indoor air calculations show the indoor air concentrations on the Smokey Point Property do not violate applicable MTCA standards.

The results are consistent with the fact that any potential impact to indoor air quality from concentrations of BTEX in groundwater below Building #1 is mitigated by the presence of the vapor barrier installed in 2010.

Based on findings from the vapor intrusion study and the presence of the vapor barrier, there are no impacts to indoor air quality in Building #1 or the remainder off the Smokey Point Property as a result of petroleum-contaminated groundwater migrating from the adjoining Source Property. The potential inhalation exposure pathway from the groundwater plume originating on the Source Property is incomplete for the Smokey Point Property, and the potential for vapor intrusion has been properly mitigated.

Respectfully,

SoundEarth Strategies, Inc.

Thomas Cammarata
Senior Environmental Geochemist

Attachments: Figure 1, Building Layout Indoor and Air Sample Locations
Figure 2, Analytical Results for Indoor and Outdoor Air Samples
Table 1, Summary of Indoor and Ambient Air Analytical Results
A, Building Survey Forms
B, Laboratory Analytical Report
Eurofins/Air Toxics #1502421
C, Stego Wrap Vapor Barrier Specifications
D, Installation of Stego Vapor Barrier Photo Plates

TJC:dmb/hsb/amr

FIGURES

4/2/2015

SoundEarth Strategies
WWW.SOUNDEARTHINC.COM

DATE: 3/30/15
DRAWN BY: JQC
CHECKED BY: TJC
CAD FILE: 0918-001_FIG1

PROJECT NAME: SMOKEY POINT RETAIL CENTER
PROJECT NUMBER: 0918-001
STREET ADDRESS: 171ST PLACE NORTHEAST
CITY, STATE: MARYSVILLE, WASHINGTON

REGION:

0 20 40 80
APPROXIMATE SCALE IN FEET

FIGURE 1
SITE PLAN AND AIR SAMPLING LOCATIONS

P:\0918 MADISON DEVELOPMENT\0918-001 SMOKEY POINT\TECHNICAL\CAD\2015\0918-001_FIG1.DWG

4/2/2015

Sample Name	Analytical Results (micrograms per cubic meter)				
	Benzene	Toluene	Ethylbenzene	m,p-Xylene	o-Xylene
0918-IA01-20150219	0.15	3.6	0.14	0.60	0.35
MTCA Method B Indoor Air Cleanup Level	**0.321**	**2,290**	**457**	**45.7**	**45.7**

Sample Name	Analytical Results (micrograms per cubic meter)				
	Benzene	Toluene	Ethylbenzene	m,p-Xylene	o-Xylene
0918-0A01-20150219	0.85	3.3	0.51	1.7	0.64
MTCA Method B Indoor Air Cleanup Level	**0.321**	**2,290**	**457**	**45.7**	**45.7**

28TH DRIVE NORTHEAST

172ND STREET NORTHEAST

171ST PLACE NORTHEAST

FORMER CANOPY AND PUMPS

SMOKEY POINT CHEVRON SITE

FORMER USTs

SMOKEY POINT STORE BUILDING

BUILDING 1

BUILDING 2

SMOKEY POINT RETAIL CENTER

JOHN L SCOTT REAL ESTATE

MW-101*

MW-111*

MW-112 (94.20')

MW-113 (94.06')

MW-114 (93.79')

MW-115 (93.87')

MW-116 (93.75')

MW-117 (93.96')

MW-118 (94.20')

0918-1A01-20150219

0918-0A01-20150219

94.10'

94.00'

93.90'

93.80'

N

LEGEND

- PROPERTY BOUNDARY
- APPROXIMATE EXTENT OF PCS
- MW-111 MONITORING WELL
- INDOOR AIR SAMPLE LOCATION
- OUTDOOR AIR SAMPLE LOCATION
- 0.10-FOOT-INTERVAL GROUNDWATER CONTOUR
- (93.75') GROUNDWATER SURFACE ELEVATION
- GROUNDWATER FLOW DIRECTION (AUGUST 7, 2014)
- * GROUNDWATER ELEVATION NOT USED TO CREATE CONTOURS
- PCS PETROLEUM-CONTAMINATED SOIL
- MTCA WASHINGTON STATE MODEL TOXICS CONTROL ACT
- UST UNDERGROUND STORAGE TANK

AIR SAMPLE RESULTS IN MICROGRAMS PER CUBIC METER (µg/m³)

SoundEarth Strategies
WWW.SOUNDEARTHINC.COM

DATE: 3/30/15
DRAWN BY: JQC
CHECKED BY: TJC
CAD FILE: 0918-001_FIG2

PROJECT NAME: SMOKEY POINT RETAIL CENTER
PROJECT NUMBER: 0918-001
STREET ADDRESS: 171ST PLACE NORTHEAST
CITY, STATE: MARYSVILLE, WASHINGTON

REGION:

0 20 40 80
APPROXIMATE SCALE IN FEET

FIGURE 2
ANALYTICAL RESULTS FOR INDOOR AND OUTDOOR AIR SAMPLES

P:\0918 MADISON DEVELOPMENT\0918-001 SMOKEY POINT\TECHNICAL\CAD\2015\0918-001 FIG2.DWG

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TABLE

Table 1
Summary of Indoor and Ambient Air Analytical Results
171st Street Place Northeast
Marysville, Washington

Sample Location (Address/Building/Room)	Sample Name	Sample Date	Analytical Results (micrograms per cubic meter)[1]									
			Benzene		Toluene		Ethylbenzene		m,p-Xylene		o-Xylene	
			Original	Adjusted for Intake[2]	Original	Adjusted for Intake[2]	Original	Adjusted for Intake[2]	Original	Adjusted for Intake[2]	Original	for Intake[2]
Building 1 (Indoor; Northwest Corner)	0918-IA01-20150219	02/19/15	**1.0**	**0.15**	6.9	**3.6**	0.65	**0.14**	2.3	**0.60**	0.99	**0.35**
Roof Air Intake (Outdoor)	0918-0A01-20150219	02/19/15	**0.85**	--	3.3	--	0.51	--	1.7	--	0.64	--
MTCA Method B Indoor Air Cleanup Level			**0.321**[3]		**2,290**[4]		**457**[4]		**45.7**[4]		**45.7**[4]	

NOTES:

RED indicates concentration exceeds MTCA Method B Cleanup Level for Air.

Laboratory analyses conducted by Eurofins Air Toxics, Inc. of Folsom, California.

[1]Analyzed by U.S. Environmental Protection Agency Method Modified TO-15 Low Level Analysis.

[2]The adjusted concentration is the result of subtracting the roof intake (outdoor ambient air) concentration from the indoor air sample concentration. This correction method is in accordance with the Washington State Department of Ecology Guidance for Evaluating Soil Vapor Intrusion.

[3]MTCA Method B Indoor Air Cleanup Level, Carcinogen, CLARC database.

[4]MTCA Method B Indoor Air Cleanup Level, Non-Carcinogen, CLARC database.

-- = not applicable

< = not detected at a concentration exceeding laboratory reporting limit

CLARC = cleanup levels and risk calculations
MTCA = Washington State Model Toxics Control Act

ATTACHMENT A
BUILDING SURVEY FORMS

APPENDIX M – BUILDING SCREENING FORM

Occupant of Building SAVVY MATTRESS

Address 2707 17 ST PL NE STE 101

City MARYSVILLE, WA

Field Investigator J. OESTER Date 1/27/2015

Field Instrument Reading	Measurement Location (Ambient Air, Foundation Opening, or Consumer Product)	If Consumer Product, Potential Volatile Ingredients
0.0	MATTRESS	
	LYSOL POWER + FREE	
	FEBREZE	
	SOFTSOAP	
	DAP FAST 'N' FINAL	
	SCHICK HYDRO	
	RODDA PAINT	
	WINDEX	
	WOOLITE	

Comments:

FIELD REPORT

Page 1 of ___

SoundEarth Strategies
2811 Fairview Avenue East, Suite 2000
Seattle, Washington 98102
P: (206) 306-1900 F: (206) 306-1907

Client & Site Name/Number:		SoundEarth Project Number:	Date:
MADISON DEVELOPMENT, SINKEY PT-		0918	1/27/2015
Site Address:		**Purpose of Visit/Task #:**	**Field Report Prepared by:**
2707 171ST PLACE NE		VI BUILDING INVENTORY	T. OESTER
Temp/Weather:	**Permit Required to Work:**	**Time of Arrival/Departure (2400):**	**Personnel Onsite:**
OVERCAST, 50's	N/A	0945 onsite to 1045 offsite	TGO

0945: ARRIVE ON SITE. PREPARE FIELD NOTES / PAPERWORK. REVIEW HTS. DON PPE.

1000: DEBBIE W/ MADISON DEVELOPMENT ON SITE.

1025: FINISHED W/ BUILDING INVENTORY. NO PID READING FROM MATTRESSES. FEW RANDOM CLOTHING DUMPIES MOSTLY IN WOMEN'S REST ROOM.

1030: EXPLAIN SCHEDULE OF SAMPLING TO DEBBIE. WILL LET HER KNOW. PROBABLY LATE NEXT WEEK.

1045: OFF SITE.

1/27/2015

Attachments:

APPENDIX L - BUILDING SURVEY FORM

Preparer's Name: TYLER VESTER Date/Time Prepared: 1000 1/27/15
Affiliation: CONSULTANT Phone Number: 206 300 1900

Occupant Information

Occupant Name: SAVVY MATTRESS OUTLET Interviewed: ☐ Yes ☒ No
Mailing Address: 2707 172ND PL NE STE 101
City: MARYSVILLE State: WA Zip Code: 98271
Phone: 360-654-8100 Email:

Owner/Landlord Information (Check if same as occupant ☐)

Occupant Name: MADISON DEVELOPMENT GROUP Interviewed: ☐ Yes ☒ No
Mailing Address: 10510 NORTHEAST NORTHRUP WAY, STE 120
City: KIRKLAND State: WA Zip Code: 98033
Phone: 425-889-9500 Email: tom@mdgllc.net

Building Type (Check appropriate boxes)

☐ Residential ☐ Residential Duplex ☐ Apartment Building ☐ Mobile Home ☐ Commercial (office)
☐ Commercial (warehouse) ☐ Industrial ☒ Strip Mall ☐ Split Level ☐ Church ☐ School

Building Characteristics

Approximate Building Age (years): 7 Number of Stories: 1
Approximate Building Area (square feet): 3360 Number of Elevators: 0

Foundation Type (Check appropriate boxes)

☒ Slab-on-Grade ☐ Crawl Space ☐ Basement

Basement Characteristics (Check appropriate boxes)

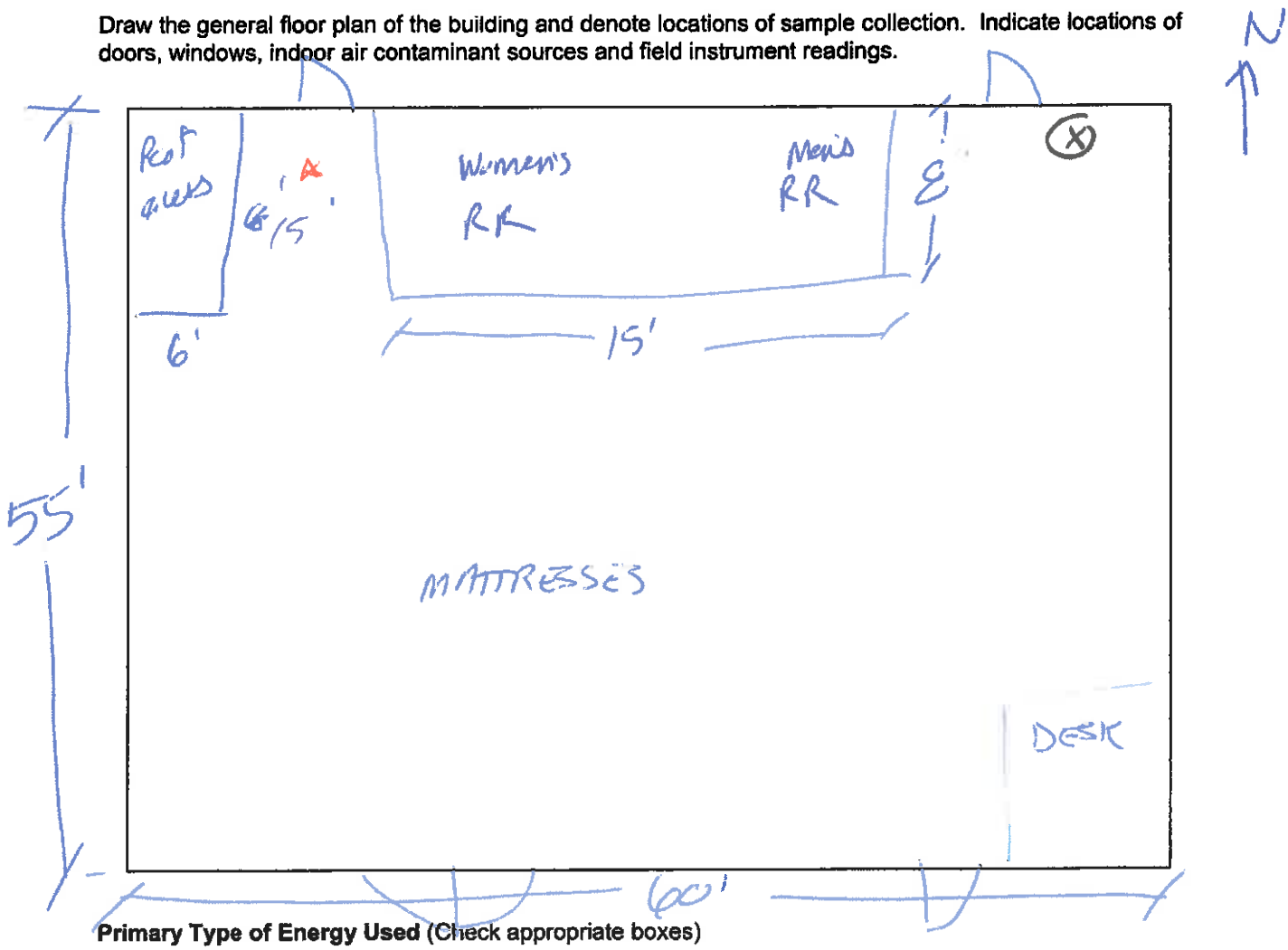
☐ Dirt Floor ☐ Sealed ☐ Wet Surfaces ☐ Sump Pump ☐ Concrete Cracks ☐ Floor Drains

Factors Influencing Indoor Air Quality

Is there an attached garage?	☐ Yes ☒ No		
Is there smoking in the building?	☐ Yes ☒ No		
Is there new carpet or furniture?	☒ Yes ☐ No	Describe:	NEW 2007/08
Have clothes or drapes been recently dry cleaned?	☐ Yes ☒ No	Describe:	
Has painting or staining been done with the last six months?	☐ Yes ☐ No	Describe:	
Has the building been recently remodeled?	☐ Yes ☒ No	Describe:	
Has the building ever had a fire?	☐ Yes ☒ No		
Is there a hobby or craft area in the building?	☐ Yes ☒ No	Describe:	
Is gun cleaner stored in the building?	☐ Yes ☒ No		
Is there a fuel oil tank on the property?	☐ Yes ☒ No		
Is there a septic tank on the property?	☐ Yes ☒ No		
Has the building been fumigated or sprayed for pests recently?	☐ Yes ☒ No	Describe:	
Do any building occupants use solvents at work?	☐ Yes ☒ No	Describe:	

Sampling Locations

Draw the general floor plan of the building and denote locations of sample collection. Indicate locations of doors, windows, indoor air contaminant sources and field instrument readings.



Primary Type of Energy Used (Check appropriate boxes)

☒ Natural Gas ☐ Fuel Oil ☐ Propane ☐ Electricity ☐ Wood ☐ Kerosene

Meteorological Conditions

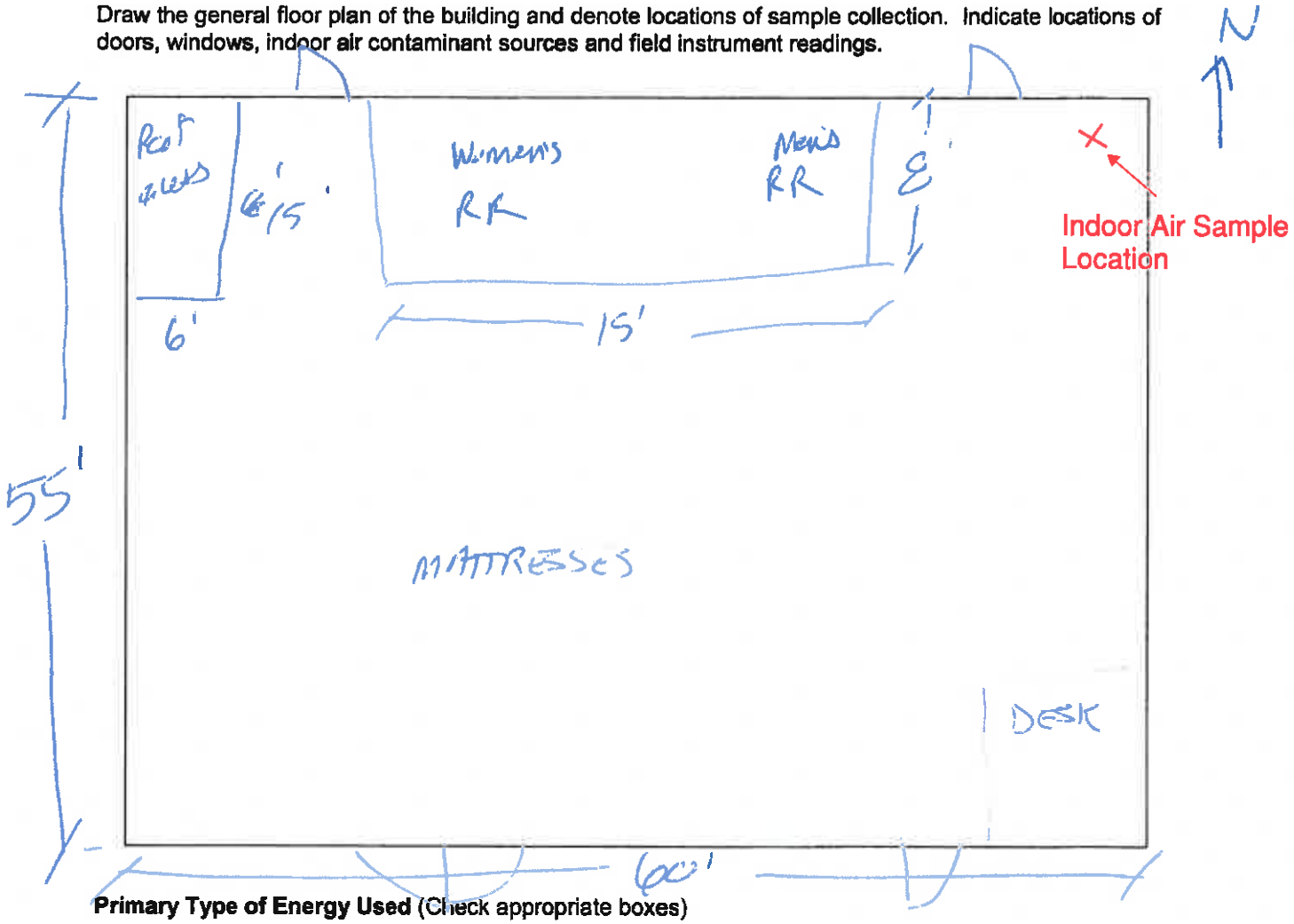
Describe the general weather conditions during the indoor air sampling event.

General Comments

Provide any other information that may be of importance in understanding the indoor air quality of this building.

Sampling Locations

Draw the general floor plan of the building and denote locations of sample collection. Indicate locations of doors, windows, indoor air contaminant sources and field instrument readings.



Primary Type of Energy Used (Check appropriate boxes)

☒ Natural Gas ☐ Fuel Oil ☐ Propane ☐ Electricity ☐ Wood ☐ Kerosene

Meteorological Conditions

Describe the general weather conditions during the indoor air sampling event.

_____

General Comments

Provide any other information that may be of importance in understanding the indoor air quality of this building.

_____

_____

_____

_____

_____

ATTACHMENT B
LABORATORY ANALYTICAL REPORT

Eurofins/Air Toxics #1502421

eurofins | Air Toxics

3/10/2015
Mr. Tyler Oester
SoundEarth Strategies, Inc
2811 Fairview Avenue East
Suite 2000
Seattle WA 98102

Project Name: Smokey Point
Project #:
Workorder #: 1502421

Dear Mr. Tyler Oester

The following report includes the data for the above referenced project for sample(s) received on 2/25/2015 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-15 SIM are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Air Toxics Ltd. for your air analysis needs. Air Toxics Ltd. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Kelly Buettner

Project Manager

eurofins | Air Toxics

WORK ORDER #: 1502421

Work Order Summary

CLIENT:	Mr. Tyler Oester SoundEarth Strategies, Inc 2811 Fairview Avenue East Suite 2000 Seattle, WA 98102	**BILL TO:**	Mr. Tyler Oester SoundEarth Strategies, Inc 2811 Fairview Avenue East Suite 2000 Seattle, WA 98102
PHONE:	206-306-1900	**P.O. #**	0918
FAX:	206-306-1907	**PROJECT #**	Smokey Point
DATE RECEIVED:	02/25/2015	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	03/10/2015		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	0918_IA01_20150219	Modified TO-15 SIM	3.7 "Hg	5.1 psi
02A	0918_OA01_20150219	Modified TO-15 SIM	3.1 "Hg	4.9 psi
03A	Lab Blank	Modified TO-15 SIM	NA	NA
04A	CCV	Modified TO-15 SIM	NA	NA
05A	LCS	Modified TO-15 SIM	NA	NA
05AA	LCSD	Modified TO-15 SIM	NA	NA

CERTIFIED BY: Heidi Mayo DATE: 03/10/15

Technical Director

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
TX NELAP - T104704343-14-7, UT NELAP CA009332014-5, VA NELAP - 460197, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005, Effective date: 10/18/2014, Expiration date: 10/17/2015.
Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 9563
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified TO-15 SIM
SoundEarth Strategies, Inc
Workorder# 1502421

Two 6 Liter Summa Canister (SIM Certified) samples were received on February 25, 2015. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the SIM acquisition mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

Requirement	*TO-15*	*ATL Modifications*
ICAL %RSD acceptance criteria	</=30% RSD with 2 compounds allowed out to < 40% RSD	Project specific; default criteria is </=30% RSD with 10% of compounds allowed out to < 40% RSD
Daily Calibration	+- 30% Difference	Project specific; default criteria is </= 30% Difference with 10% of compounds allowed out up to </=40%.; flag and narrate outliers
Blank and standards	Zero air	Nitrogen
Method Detection Limit	Follow 40CFR Pt.136 App. B	The MDL met all relevant requirements in Method TO-15 (statistical MDL less than the LOQ). The concentration of the spiked replicate may have exceeded 10X the calculated MDL in some cases

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified
b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

eurofins | Air Toxics

Summary of Detected Compounds
MODIFIED EPA METHOD TO-15 GC/MS SIM

Client Sample ID: 0918_IA01_20150219

Lab ID#: 1502421-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.076	0.33	0.24	1.0
Toluene	0.031	1.8	0.12	6.9
Ethyl Benzene	0.031	0.15	0.13	0.65
m,p-Xylene	0.061	0.53	0.26	2.3
o-Xylene	0.031	0.23	0.13	0.99

Client Sample ID: 0918_OA01_20150219

Lab ID#: 1502421-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.074	0.27	0.24	0.85
Toluene	0.030	0.88	0.11	3.3
Ethyl Benzene	0.030	0.12	0.13	0.51
m,p-Xylene	0.059	0.39	0.26	1.7
o-Xylene	0.030	0.15	0.13	0.64

eurofins | Air Toxics

Client Sample ID: 0918_IA01_20150219

Lab ID#: 1502421-01A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**v022823sim**	**Date of Collection: 2/19/15 5:50:00 PM**	
Dil. Factor:	**1.53**	**Date of Analysis: 2/28/15 09:08 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.076	0.33	0.24	1.0
Toluene	0.031	1.8	0.12	6.9
Ethyl Benzene	0.031	0.15	0.13	0.65
m,p-Xylene	0.061	0.53	0.26	2.3
o-Xylene	0.031	0.23	0.13	0.99

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	102	70-130

eurofins | Air Toxics

Client Sample ID: 0918_OA01_20150219

Lab ID#: 1502421-02A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**v022824sim**	**Date of Collection: 2/19/15 6:12:00 PM**	
Dil. Factor:	**1.48**	**Date of Analysis: 2/28/15 09:43 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.074	0.27	0.24	0.85
Toluene	0.030	0.88	0.11	3.3
Ethyl Benzene	0.030	0.12	0.13	0.51
m,p-Xylene	0.059	0.39	0.26	1.7
o-Xylene	0.030	0.15	0.13	0.64

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	98	70-130

eurofins | Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 1502421-03A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**v022806sim**	**Date of Collection: NA**	
Dil. Factor:	1.00	**Date of Analysis: 2/28/15 09:59 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.050	Not Detected	0.16	Not Detected
Toluene	0.020	Not Detected	0.075	Not Detected
Ethyl Benzene	0.020	Not Detected	0.087	Not Detected
m,p-Xylene	0.040	Not Detected	0.17	Not Detected
o-Xylene	0.020	Not Detected	0.087	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	95	70-130

eurofins | Air Toxics

Client Sample ID: CCV

Lab ID#: 1502421-04A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**v022802sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/28/15 06:43 AM**	

Compound	%Recovery
Benzene	82
Toluene	88
Ethyl Benzene	92
m,p-Xylene	90
o-Xylene	88

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	105	70-130

eurofins | Air Toxics

Client Sample ID: LCS

Lab ID#: 1502421-05A

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**v022803sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/28/15 07:28 AM**	

Compound	%Recovery	Method Limits
Benzene	89	70-130
Toluene	95	70-130
Ethyl Benzene	96	70-130
m,p-Xylene	91	70-130
o-Xylene	92	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	98	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	101	70-130

eurofins | Air Toxics

Client Sample ID: LCSD

Lab ID#: 1502421-05AA

MODIFIED EPA METHOD TO-15 GC/MS SIM

File Name:	**v022804sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 2/28/15 08:10 AM**	

Compound	%Recovery	Method Limits
Benzene	88	70-130
Toluene	94	70-130
Ethyl Benzene	97	70-130
m,p-Xylene	94	70-130
o-Xylene	95	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	98	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	103	70-130

ATTACHMENT C
STEGO WRAP VAPOR BARRIER SPECIFICATIONS

Stego® Wrap Vapor Barrier

STEGO INDUSTRIES, LLC

Vapor Retarders
07 26 00, 03 30 00

1. Product Name
Stego Wrap Vapor Barrier

2. Manufacturer
Stego Industries, LLC
216 Avenida Fabricante, Suite 101
San Clemente, CA 92672
Sales, Technical Assistance
Ph: (877) 464-7834
Fx: (949) 257-4113
www.stegoindustries.com

3. Product Description
USES: Stego Wrap Vapor Barrier is used as a below-slab vapor barrier.
COMPOSITION: Stego Wrap Vapor Barrier is a multi-layer plastic extrusion manufactured with only high grade prime, virgin, polyolefin resins.
ENVIRONMENTAL FACTORS:
Stego Wrap Vapor Barrier can be used in systems for the control of soil gases (radon, methane), soil poisons (oil by-products) and sulfates.

5. Installation
UNDER SLAB: Unroll Stego Wrap Vapor Barrier over an aggregate, sand or tamped earth base. Overlap all seams a minimum of six inches and tape using Stego Tape or Crete Claw® Tape. All penetrations must be sealed using a combination of Stego Wrap and Stego accessories.

For additional information, please refer to Stego's complete installation instructions.

6. Availability & Cost
Stego Wrap Vapor Barrier is available nationally via building supply distributors. For current cost information, contact your local Stego Wrap distributor or Stego Industries' sales department.

7. Warranty
Stego Industries, LLC believes to the best of its knowledge, that specifications and recommendations herein are accurate and reliable. However, since site conditions are not within its control, Stego Industries does not guarantee results from the use of the information provided and disclaims all liability from any loss or damage. No warranty, express or implied, is given as to the merchantability, fitness for a particular purpose, or otherwise with respect to the products referred to.

8. Maintenance
None required.

9. Technical Services
Technical advice, custom CAD drawings, and additional information can be obtained by contacting Stego Industries' technical assistance department or via the website.

10. Filing Systems
- Stego Industries' website
- Buildsite
- 4Specs

4. Technical Data

TABLE 1: PHYSICAL PROPERTIES OF STEGO WRAP VAPOR BARRIER

PROPERTY	TEST	RESULTS
Under Slab Vapor Retarders	ASTM E 1745 Class A, B & C – Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs	Exceeds Class A, B & C
Water Vapor Permeance	ASTM F 1249 – Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor	0.0086 perms *0.0036 WVTR
Puncture Resistance	ASTM D 1709 – Test Methods for Impact Resistance of Plastic Film by Free-Falling Dart Method	2266 grams
Tensile Strength	ASTM D 882 – Test Method for Tensile Properties of Thin Plastic Sheeting	70.6 lbf/in.
Permeance After Conditioning (ASTM E 1745 Sections 7.1.2 - 7.1.5)	ASTM E 154 Section 8, F 1249 – Permeance after wetting, drying, and soaking ASTM E 154 Section 11, F 1249 – Permeance after heat conditioning ASTM E 154 Section 12, F 1249 – Permeance after low temperature conditioning ASTM E 154 Section 13, F 1249 – Permeance after soil organism exposure	0.0098 perms 0.0091 perms 0.0097 perms 0.0095 perms
Methane Transmission Rate	ASTM D 1434 – Standard Test Method for Determining Gas Permeability Characteristics of Plastic Film and Sheeting	**192.8 GTR mL(STP)/m²*day
Radon Diffusion Coefficient		5.5 x 10^{-14} m²/second
Thickness	ACI 302.1R-04 – Minimum Thickness (10 mils)	15 mils
Roll Dimensions		14 ft. wide x 140 ft. long or 1,960 ft²
Roll Weight		140 lbs.

Note: perm unit = grains/(ft² *hr* in.Hg) * WVTR = Water Vapor Transmission Rate ** GTR = Gas Transmission Rate

Note: Test results above are for Stego Wrap products made as of March 15, 2013. If you have product made prior to March 15, 2013 please refer to Stego literature dated 10/12 for representative test results or call your local Stego Representative with questions.

Stego® Mastic

STEGO INDUSTRIES, LLC

Vapor Retarders
07 26 00, 03 30 00

1. Product Name
Stego Mastic

2. Manufacturer
Stego Industries, LLC
216 Avenida Fabricante, Suite 101
San Clemente, CA 92672
Sales, Technical Assistance
Ph: (877) 464-7834
Fx: (949) 257-4113
www.stegoindustries.com

3. Product Description
USES: Stego Mastic is designed to be used as a waterproofing and vapor retardant membrane for use in conjunction with Stego Wrap 10-mil and 15-mil Vapor Retarder/Barrier. Stego Mastic can be used as an alternate to boots for pipe penetrations in Stego Wrap Vapor Barrier.
COMPOSITION: Stego Mastic is a medium-viscosity, water-based, polymer-modified anionic bitumin-ous/ asphalt emulsion, which exhibits bonding, elongation and water-proofing characteristics.
SIZE: Stego Mastic comes in five-gallon buckets.

4. Technical Data
APPLICABLE STANDARDS:
American Society for Testing and Materials (ASTM)

- ASTM D 412 Standard Test Method for Vulcanized Rubber and Therm-oplastic Elastomers - Tension
- ASTM E 154 Standard Test Methods for Water Vapor Retarders Used in Contact with Earth under Concrete Slabs, on Walls, or as Ground Cover
- ASTM G 23 Practice for Operating Light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials (Withdrawn 2000)
- ASTM E 96 Standard Test Methods for Water Vapor Transmission of Materials
- ASTM D 751 Standard Test Methods for Coated Fabrics
- ASTM D 1434 Standard Test Method for Determining Gas Permeability Characteristics of Plastic Film and Sheeting
- ASTM C 836 Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Water-proofing Membrane for Use with Separate Wearing Course.
- ASTM E 1643 Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill under Concrete Slabs.

5. Installation
PREPARATION:

- A test application simulating the project environment should always be done prior to final usage of Stego Mastic.
- All Surfaces should be dry and free of loose materials, oils and other contaminants. The surfaces should be cleaned in the same fashion as the test surface in order to ensure proper results.
- Store above 40°F

PENETRATIONS:
For small pipe and rebar penetrations in Stego Wrap Vapor Barrier cut Stego Wrap just big enough for the pene-tration. Liberally apply Stego Mastic around the penetration to keep the integrity of the membrane intact. Stego Mastic can be applied by brush, roller, or sprayer.
NOTES: 1) For larger penetrations or wide cut-outs of Stego Wrap, use Stego Wrap and Stego Tape to repair and seal. 2) Solvent-based products should not be applied over this product. 3)Clean all tools with kerosene and/or oil-based cleaners.
For additional information, please refer to Stego's complete installation instructions.

6. Availability & Cost
Stego Mastic is available nationally via building supply distributors. For current cost information, contact your local Stego distributor or Stego Industries' sales department.

7. Warranty
Stego Industries, LLC believes to the best of its knowledge, that specifications and recommendations herein are accurate and reliable. However, since site conditions are not within its control, Stego Industries does not guarantee results from the use of the information provided and disclaims all liability from any loss or damage. No warranty, express or implied, is given as to the merchan-tability, fitness for a particular purpose, or otherwise with respect to the products referred to.

8. Maintenance
None required.

9. Technical Services
Technical advice, custom CAD drawings, and additional information can be obtained by contacting Stego Industries' technical assistance department or by visiting the website.

10. Filing Systems
- Stego Industries' website
- Buildsite

TABLE 1: PHYSICAL PROPERTIES OF STEGO MASTIC

Property and Test	Stego Mastic
Tensile/Elongation, ASTM D 412	32 psi / 3860%
Resistance to Decay, ASTM E 154	9% perm loss
Accelerated Aging, ASTM G 23	No Effect
Permeance, ASTM E 96	0.17 Perms
Hydrostatic Water Pressure, ASTM D 751	28 psi
Methane Transmission Rate, ASTM D 1434	0
Adhesion to Concrete & Masonry, ASTM C 836	7 lbf./in.
Hardness, ASTM C 836	85
Crack Bridging, ASTM C 836	No Cracking
Low Temp Flexibility, ASTM C 836	No Cracking at -20°C
Resistance to Acids:	
Acetic	30%
Sulfuric and Hydrochloric	15%
Temperature Effect:	
Stable	248°F
Flexible	13°F

Note: perm unit = grains/(ft² *hr* in.Hg)

Stego® Tape

STEGO INDUSTRIES, LLC

Vapor Retarders
07 26 00, 03 30 00

1. Product Name
Stego Tape

2. Manufacturer
Stego Industries, LLC
216 Avenida Fabricante, Suite 101
San Clemente, CA 92672
Sales, Technical Assistance
Ph: (877) 464-7834
Fx: (949) 257-4113
www.stegoindustries.com

3. Product Description
USES: Stego Tape is a low permeance tape designed for protective sealing, hanging, seaming, splicing, and patching applications where a highly conformable material is required. It has been engineered to bond specifically to Stego Wrap, making it ideal for sealing Stego Wrap seams and penetrations.

COMPOSITION: Stego Tape is composed of polyethylene film and an acrylic, pressure-sensitive adhesive.

SIZE: Stego Tape is 3.75" wide and 180' long. Stego Tape ships 12 rolls in a case.

4. Technical Data
APPLICABLE STANDARDS:

Pressure Sensitive Tape Council (PSTC)

- PSTC 101 – International Standard for Peel Adhesion of Pressure Sensitive Tape

American Society for Testing & Materials (ASTM)

- ASTM E 1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill under Concrete Slabs

5. Installation
SEAMS:

Overlap Stego Wrap six inches and seal with Stego Tape. Make sure the area of adhesion is free from dust, dirt, moisture and frost to allow maximum adhesion of the pressure sensitive tape.

PIPE PENETRATION SEALING

1) Install Stego Wrap around pipe by slitting/cutting material
2) If void space around pipe is minimal, seal around base of pipe with Stego Tape (Stego Mastic can be used for additional coverage)

DETAIL PATCH FOR PIPE PENETRATION SEALING

1) Cut a piece of Stego Wrap that creates a six inch overlap around all edges of the void space
2) Cut an "X" in the center of the detail patch
3) Slide detail patch over pipe, secure tightly
4) Tape down all sides of detail patch with Stego Tape
5) Seal around base of pipe with Stego Tape (Stego Mastic can be used for additional coverage)

Stego Tape should be installed above 40°F. In temperatures below 40°F, take extra care to remove moisture or frost from the area of adhesion.

For additional information, please refer to Stego's complete installation instructions.

6. Availability & Cost
Stego Tape is available nationally via building supply distributors. For current cost information, contact your local Stego distributor or Stego Industries' sales department.

7. Warranty
Stego Industries, LLC believes to the best of its knowledge, that specifications and recommendations herein are accurate and reliable. However, since site conditions are not within its control, Stego Industries does not guarantee results from the use of the information provided and disclaims all liability from any loss or damage. No warranty, express or implied, is given, as to the merchantability, fitness for a particular purpose, or otherwise with respect to the products referred to.

8. Maintenance
None required.

9. Technical Services
Technical advice, custom CAD drawings, and additional information can be obtained by contacting Stego Industries' technical assistance department or by visiting the website.

10. Filing Systems
- Stego Industries' website
- Buildsite

TABLE 1: PHYSICAL PROPERTIES OF STEGO TAPE

PROPERTY	RESULTS
Total Thickness	6 mils
Permeance	0.03 perms
Tensile Strength	17 lbs./in. width
Elongation (at break) MD	1060%
Adhesion (20 min dwell ss, PSTC 101)	95-oz./in. width
Ultraviolet Resistance	Excellent

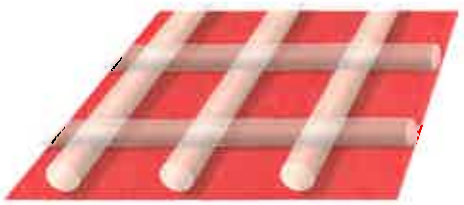
STEGO CRETE CLAW® TAPE

Stego Crete Claw® Tape provides an innovative and economical way to secure plastic film to concrete while the concrete is still wet.

Crete Claw is a multi-layered tape/detail strip that will mechanically lock Stego Wrap Vapor Barrier to concrete. The patent-pending design allows wet concrete to cast into the textured surface of Crete Claw. Just stick Crete Claw to Stego Wrap prior to concrete placement, then place the concrete directly over the system.

Stego Crete Claw can be used in place of Stego Tape to seal joints in Stego Wrap Vapor Barrier providing a dual purpose and helping to offset costs.

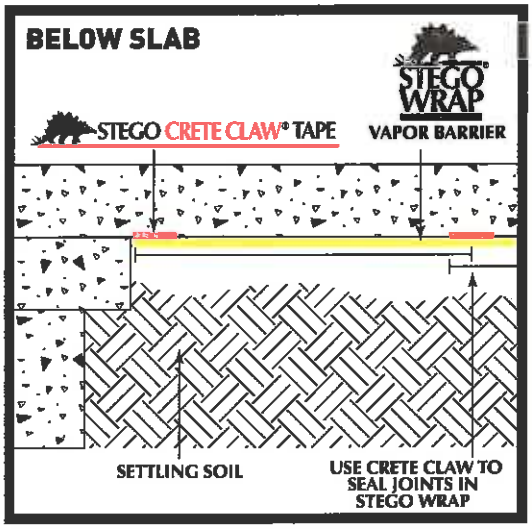
The patent-pending design allows wet concrete to cast into the textured surface of Crete Claw



ANGLED TOP VIEW

MOST COMMON APPLICATIONS FOR CRETE CLAW®		6" Wide	3" Wide
ASTM E 1643 - Forming seal to the slab at perimeter		✓	✓
Securing Stego Wrap to bottom of slab for expansive/settling soils and carton/void form applications	Perimeter	✓	
	Seams	✓	

- Quick and easy to install
- Saves time and money
- Innovative Solution to help meet ASTM E 1643



Other more expensive products rely on chemical reaction or geotextile to bond with concrete making it all but impossible to properly install the vapor barrier. Often in pursuit of the all-in-one product, the performance characteristics of the vapor barrier are compromised. Because Crete Claw Tape is applied as a separate accessory to the vapor barrier, it does not interfere with the ability to detail around penetrations or repair damaged areas.

TABLE 1: CRETE CLAW TAPE TEST RESULTS

PROPERTY	TEST	RESULTS
Total Thickness		26 mils
Permeance	ASTM F 1249	0.03 perms
180° Adhesion Peel Strength	ASTM D 903	17.6 lbf/in.
Sheer Adhesion Strength	1 in.² shear test using an Instron 3345 Machine	>49 lbf/in.²*
Roll Sizes		6" x 180' and 3" x 180' **

* Specimens failed by stretching vapor barrier to failure before pulling Crete Claw from concrete.
** 3" wide is for perimeter seal application only.

Contact us to learn more about this innovative product.

STEGO INDUSTRIES, LLC | San Clemente, CA | 949-257-4100 | Toll Free 877-464-7834 | Fax 949-257-4113 | www.stegoindustries.com

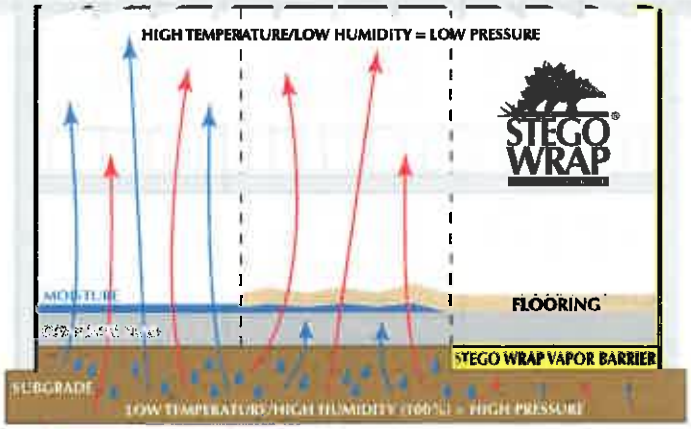
04/2013

STEGO® WRAP VAPOR BARRIER

ASTM E 1745 Class A-B-C Compliant

STEGO® WRAP VAPOR BARRIER

is made with our proven trade secret blend of prime virgin resins and additives. Stego Wrap Vapor Barrier is an ASTM E 1745 Class A Vapor Barrier (Below 0.01 perms). We focus on producing a product that will maintain its extremely low permeance for the life of a building. The protection of Stego Wrap Vapor Barrier provides the flexibility to change flooring types and overall building use without worrying about below-slab moisture vapor.



Regardless of the location of the water table, humidity below concrete slabs approximates 100%. Typical below slab vapor pressure is more than twice that of building interiors at room temperature, creating vapor drive from the substrate, up through the slab, and into the building.

FEATURES & BENEFITS

Unsurpassed Permeance Characteristics

Life of the Building Protection

Exceptional Tear and Puncture Resistance

Easy, Reliable Installation

Competitively Priced

Available Nationwide

Local Support

THE STEGO® ADVANTAGES

SUPERIOR DEFENSE Against Floor Failures:

Experts say "the need for a vapor barrier (as opposed to a vapor retarder) is becoming increasingly clear." Concrete Construction Magazine, August 2003, p.18.

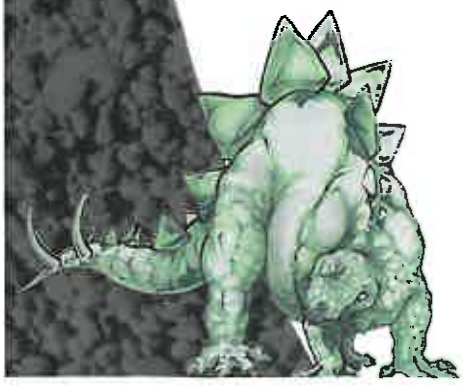
Infiltration of moisture through concrete slabs is a major building defect liability. Stego Wrap Vapor Barrier has an extremely low permeance preventing water vapor, soil gases (i.e. Radon), alkaline salts and soil sulfates from compromising the integrity of the building envelope and leading to serious problems with the concrete slab, floor coverings and indoor air quality. Stego Wrap Vapor Barrier is the best protection against these costly failures.

MOLD PREVENTION:

Mold needs three things to survive: moisture, sustained temperature (between 50° and 122° F), and a food source (dust, drywall, etc.). In any given building environment, contractors can only control one of these variables: moisture. Mold spores are present in 100% of building interiors. If moisture is allowed into your building environment, mold can and will grow. Toxic molds like Stachybotyrus can be fatal for nearly 5% of people (Institute of Medicine 1993), and cause a variety of serious health problems in others. Several recent well-publicized cases involving toxic mold have resulted in multimillion-dollar insurance settlements. Many of the nation's leading insurance companies have severely limited or removed coverage for mold claims fearing that these claims will bankrupt their companies. Now more than ever, it is critically important that extra attention be paid to preventing the intrusion of moisture vapor from your below-slab environment. Stego Wrap Vapor Barrier offers the level of protection that many architects are now seeking and is considered to be inexpensive insurance against these costly failures.

LONGEVITY AND STRENGTH:

Stego Wrap Vapor Barrier is NOT made with recycled materials and will not degrade. Prime, virgin resins are the key. Molecules within Stego Wrap "interlock" to provide strength, durability and unprecedented resistance to moisture vapor and radon gas. Stego Wrap's puncture resistance is excellent. Stego Wrap will not tear, crack, flake, snag or puncture, even when 18,000 lb. laser-screed machines are driving directly across the barrier (see the reverse side for Stego Wrap Vapor Barrier's specifications).



Stego Industries, LLC · San Clemente, CA
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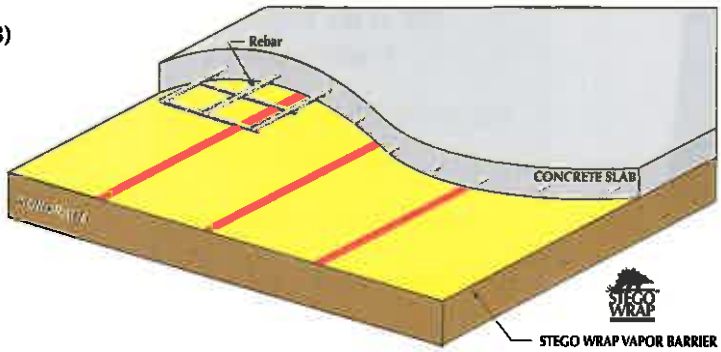
STEGO® WRAP VAPOR BARRIER SPECIFICATIONS

PROPERTIES	TEST METHOD	ASTM E 1745 Class A Requirements	TEST RESULT	EXPLANATION
Permeance	ASTM F 1249	0.1 perms	0.0086 perms * 0.0036 WVTR	Very impermeable to water vapor
Puncture Resistance	ASTM D 1709	2200 grams	Method B 2266 grams	Resistant to puncturing from construction abuse
Tensile Strength	ASTM D 882	45.0 lbf./in.	70.6 lbf./in.	Will not tear easily
Permeance After Conditioning (ASTM E 1745 Sections 7.1.2 - 7.1.5)	ASTM E 154 section 8	0.1 perms	0.0098 perms	Permeance after wetting, drying, and soaking
	ASTM E 154 section 11	0.1 perms	0.0091 perms	Permeance after heat conditioning
	ASTM E 154 section 12	0.1 perms	0.0097 perms	Permeance after low temperature conditioning
	ASTM E 154 section 13	0.1 perms	0.0095 perms	Permeance after soil organism exposure
Methane Transmission Rate	ASTM D 1434		**GTR = 192.8 mL(STP)/m^2*day	Greatly impedes the transmission of methane gas
Radon Diffusion Coefficient			5.5 x 10^{-14} m^2/second	Greatly impedes the transmission of radon gas
Thickness			15 mils	Stronger, tougher and less permeable than much thicker membranes
Roll Dimensions			14 ft. X 140 ft.	1,960 ft^2/roll - allows for a minimum of seams
Roll Weight			140 lbs.	Easy to unroll and install

Note: perm unit = grains/(ft^2 *hr* in.Hg) * WVTR = water vapor transmission rate **GTR = Gas Transmission Rate

INSTALLATION INSTRUCTIONS: (Based on ASTM E 1643)

Unroll Stego Wrap over the area where the slab is to be placed. Stego Wrap should completely cover the concrete placement area. Overlap seams 6 inches and tape using Stego Tape. All penetrations and blockouts should be sealed using a combination of Stego Wrap, Stego Tape and/or Stego Mastic. If the Stego Wrap is damaged, cut a piece from the Stego Wrap roll, place over the damaged area, and tape around all edges. Concrete may be placed directly on Stego Wrap. For additional information, please refer to Stego's complete installation instructions.



STEGO® TAPE:

STEGO WRAP RED POLYETHYLENE TAPE (3.75" x 180'/roll) is specially designed to seal seams and penetrations on Stego Wrap installations. The acrylic, pressure-sensitive adhesive provides permanent bonding and quick-stick properties. The area to be bonded should be free of dust, dirt and moisture.

WARRANTY:

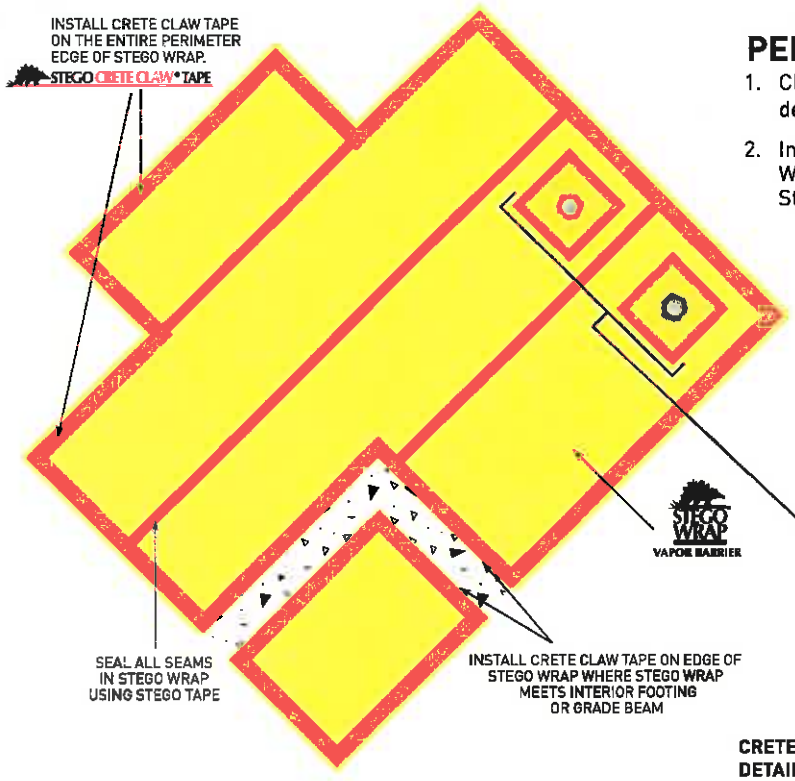
STEGO INDUSTRIES, LLC believes, to the best of its knowledge, that specifications and recommendations herein are accurate and reliable. However, since site conditions and installations are not within our control, STEGO INDUSTRIES, LLC does not guarantee results from use of the information provided and disclaims all liability from any loss or damage. NO WARRANTY EXPRESS OR IMPLIED IS GIVEN AS TO THE MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE, OR OTHERWISE WITH RESPECT TO THE PRODUCTS REFERRED TO.

Note: Test results above are for Stego Wrap products made as of March 15, 2013. If you have product made prior to March 15, 2013, please refer to Stego literature dated 10/12 for representative test results or call your local Stego Representative with questions.

Stego Industries, LLC · San Clemente, CA
Tel: 949-257-4100 · Toll Free: 877-464-7834 · Fax: 949-257-4113 · www.stegoindustries.com

04/2013

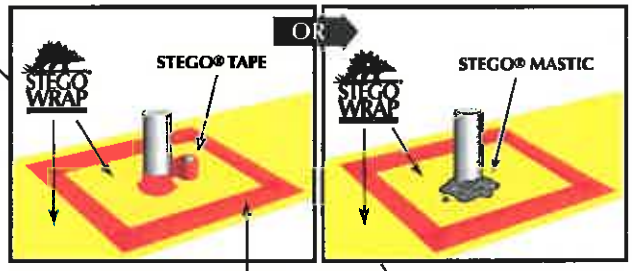
STEGO CRETE CLAW® TAPE
INSTALLATION INSTRUCTIONS
TOP-DOWN VIEWS OF A BUILDING FOOTPRINT



PERIMETER SEAL TO SLAB

1. Clean surface of Stego Wrap to ensure that it is free of moisture and debris prior to the installation of Crete Claw Tape.
2. Install 3" or 6" Crete Claw Tape on the entire perimeter of the Stego Wrap installation. Crete Claw Tape should be completely on Stego Wrap.

SEAL ALL PENETRATIONS WITH STEGO TAPE AND/OR STEGO MASTIC. CRETE CLAW TAPE IS NOT MEANT FOR REPAIRING PENETRATIONS.



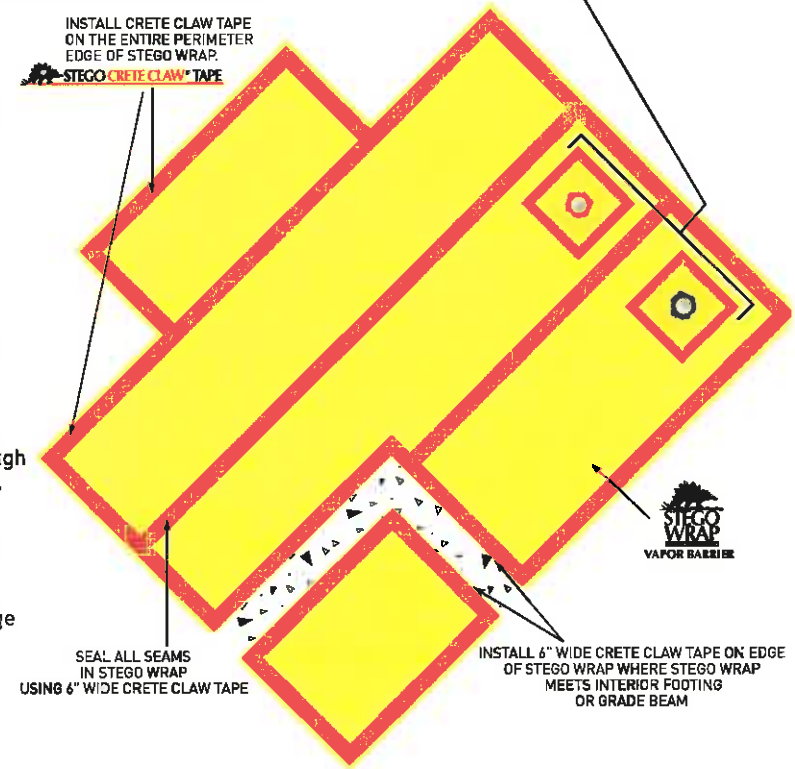
CRETE CLAW CAN BE USED TO SEAL SEAM AROUND DETAIL PATCH FOR ADDED PROTECTION.

SECURING STEGO WRAP TO THE BOTTOM OF THE SLAB

1. Clean surface of Stego Wrap to ensure that it is free of moisture and debris prior to the installation of 6" wide Crete Claw Tape.
2. Overlap seams a minimum of 6 inches. Seal all seams in Stego Wrap using Crete Claw Tape.
3. Install 6" wide Crete Claw Tape on the entire perimeter of the Stego Wrap installation. Crete Claw Tape should be completely on Stego Wrap.
4. Install additional Crete Claw Tape if required. Lab and simulated field tests have shown that if 6" wide Crete Claw is installed on all seams and around the perimeter, then it is more than strong enough to support Stego Wrap. If determined by the architect or engineer, additional Crete Claw may be specified.
5. Prior to the placement of concrete, ensure that Crete Claw is free of dirt or debris to ensure maximum bond to the concrete.

These are general instructions. Installation requirements may change on a project-by-project basis

IMPORTANT - For the application of securing Stego Wrap to the bottom of the slab, always use 6" wide Crete Claw Tape.



NOTE: Stego Industries, LLC's ("Stego") Installation Instructions are based on ASTM E 1643 - *Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.* These instructions are meant to be used as a guide, and do not take into account specific job site situations. Consult local building codes and regulations along with the building owner or owner's representative before proceeding. If you have any questions regarding the above mentioned installation instructions, Stego products, please call us at 877-464-7834 for technical assistance. While Stego employees and representatives may provide technical assistance regarding the utility of a specific installation practice or Stego product, they are not authorized to make final design decisions.

Stego® Crete Claw® Tape

STEGO INDUSTRIES, LLC

Vapor Retarders
07 26 00

1. Product Name
Stego® Crete Claw® Tape

2. Manufacturer
Stego Industries, LLC
216 Avenida Fabricante, Suite 101
San Clemente, CA 92672
Sales, Technical Assistance
Ph: (877) 464-7834
Fx: (949) 257-4113
www.stegoindustries.com

3. Product Description
USES: Stego Crete Claw Tape is a multi-layered tape that is used to seal Stego Wrap to concrete while the concrete is still wet. Crete Claw allows wet concrete to cast into the textured top surface to form a mechanical bond/seal.
COMPOSITION: Stego Crete Claw is composed of polyethylene film, aperture film, and an acrylic, pressure sensitive adhesive.
SIZE: Stego Crete Claw is 6" wide by 180' long. Stego Crete Claw ships 8 rolls in a case.

4. Technical Data

TABLE 1: PHYSICAL PROPERTIES OF STEGO CRETE CLAW

PROPERTY	RESULTS
Dimensions	6" x 180'
Total Thickness	26 mils
Permeance: ASTM F 1249	0.03 perms
180° Adhesion Peel Strength: ASTM D 903	17.6 lbf/in.
Sheer Adhesion Strength: 1 in^2 shear test using an Instron 3345 Machine	>49 lbf/in^2*

* Specimens failed by stretching vapor barrier to failure before pulling Crete Claw from concrete.

5. Installation
SECURING STEGO WRAP TO SLAB: Clean the surface of Stego Wrap to ensure that it is free of moisture, frost, dirt, and debris prior to the installation of Stego Crete Claw. When ready to apply Crete Claw, peel back the release liner and apply to Stego Wrap. Stego Crete Claw should be completely on Stego Wrap.

Install Crete Claw Tape on all seams and around the entire perimeter of the Stego Wrap installation.

To detail, cut Stego Crete Claw with a box knife or scissors. Crete Claw should be installed above 40°F for maximum adhesion. For additional information, please refer to Stego's complete installation instructions.

TIP: Wrap the release liner back over the entire roll while unrolling Crete Claw. This technique will allow the release liner to pull off easily and keep it out of the way.

6. Availability & Cost
Stego Crete Claw is available nationally through our network of building supply distributors. For current cost information, contact your local Stego Wrap distributor or Stego Industries' Sales Representative.

7. Warranty
Stego Industries, LLC believes to the best of its knowledge, that specifications and recommendations herein are accurate and reliable. However, since site conditions are not within its control, Stego Industries does not guarantee results from the use of the information provided and disclaims all liability from any loss or damage. No warranty, express or implied, is given as to the merchantability, fitness for a particular purpose, or otherwise with respect to the products referred to.

8. Maintenance
Store Stego Crete Claw in a dry and temperate area.

9. Technical Services
Technical advice, custom CAD drawings, and additional information can be obtained by contacting Stego Industries' technical department or via our website.

10. Filing Systems
www.stegoindustries.com
Buildsite

Stego® Crete Claw® (3" Wide)

STEGO INDUSTRIES, LLC

Vapor Retarders
07 26 00

1. Product Name
Stego® Crete Claw® (3" Wide)

2. Manufacturer
Stego Industries, LLC
216 Avenida Fabricante, Suite 101
San Clemente, CA 92672
Sales, Technical Assistance
Ph: (877) 464-7834
Fx: (949) 257-4113
www.stegoindustries.com

3. Product Description
USES: Stego Crete Claw is a multi-layered tape that is used to seal Stego Wrap to the perimeter of the slab while the concrete is placed. Crete Claw allows wet concrete to cast into the textured top surface to form a mechanical bond/seal.
COMPOSITION: Stego Crete Claw is composed of polyethylene film, aperture film, and an acrylic, pressure sensitive adhesive.
SIZE: Stego Crete Claw (3" Wide) is 3" wide and 180' long. Stego Crete Claw (3" Wide) ships 16 rolls in a case.

4. Technical Data

TABLE 1: PHYSICAL PROPERTIES OF STEGO CRETE CLAW (3" Wide)

PROPERTY	RESULTS
Dimensions	3" x 180'
Total Thickness	26 mils
Permeance: ASTM F 1249	0.03 perms
180° Adhesion Peel Strength: ASTM D 903	17.6 lbf/in.
Sheer Adhesion Strength: 1 in^2 shear test using an Instron 3345 Machine	>49 lbf/in^2*

* Specimens failed by stretching vapor barrier to failure before pulling Crete Claw from concrete.

5. Installation
UNDER SLAB: Clean surface of Stego Wrap to ensure that it is free of moisture, frost, dirt, and debris prior to the installation of Stego Crete Claw. When ready to apply Crete Claw, peel back the release liner and apply to Stego Wrap. Stego Crete Claw should be completely on Stego Wrap.

To detail, cut Stego Crete Claw with a box knife or scissors. Crete Claw should be installed above 40°F for maximum adhesion. For additional information please refer to Stego's complete installation instructions.

TIP: Wrap the release liner back over the entire roll while unrolling Crete Claw. This technique will allow the release liner to pull off easily and keep it out of the way.

6. Availability & Cost
Stego Crete Claw (3" Wide) is available nationally through our network of building supply distributors. For current cost information, contact your local Stego Wrap distributor or Stego Industries' Sales Representative.

7. Warranty
Stego Industries, LLC believes to the best of its knowledge, that specifications and recommendations herein are accurate and reliable. However, since site conditions are not within its control, Stego Industries does not guarantee results from the use of the information provided and disclaims all liability from any loss or damage. No warranty, express or implied, is given as to the merchantability, fitness for a particular purpose, or otherwise with respect to the products referred to.

8. Maintenance
Store Stego Crete Claw in a dry and temperate area.

9. Technical Services
Technical advice, custom CAD drawings, and additional information can be obtained by contacting Stego Industries' technical department or via our website.

10. Filing Systems
www.stegoindustries.com
Buildsite

StegoTack® Tape

STEGO INDUSTRIES, LLC

Vapor Retarders
07 26 00, 03 30 00

1. Product Name
StegoTack® Tape

2. Manufacturer
Stego Industries, LLC
216 Avenida Fabricante, Suite 101
San Clemente, CA 92672
Sales, Technical Assistance
Ph: (877) 464-7834
Fx: (949) 257-4113
www.stegoindustries.com

3. Product Description
USES: StegoTack Tape is a double-sided adhesive strip used to bond and seal Stego Wrap to concrete, masonry, wood, metal, and other surfaces. StegoTack is a flexible and moldable material to allow for a variety of applications and installations.
COMPOSITION: StegoTack Tape is made from a blend of synthetic rubber and resins. SIZE: StegoTack Tape is 2 inches wide and 50 feet long. StegoTack Tape ships 12 rolls in a case.

5. Installation
TO WALLS: Make sure the area of adhesion is free of dust, dirt, debris, moisture, and frost to allow maximum adhesion. Remove release liner on one side and stick to desired surface. When ready to apply Stego Wrap, remove the exposed release liner and press Stego Wrap firmly against StegoTack Tape to secure.

TO FOOTINGS: Make sure the area of adhesion is free of dust, dirt, debris, moisture, and frost to allow maximum adhesion. Remove release liner on one side and stick to desired surface. When ready to apply Stego Wrap, remove the exposed release liner and press Stego Wrap firmly against StegoTack Tape to secure.

Cut StegoTack Tape using a utility knife or scissors. Cut StegoTack Tape before removing the release liner for easier cutting. Install StegoTack Tape between 40°F and 110°F. For additional information please refer to Stego's complete installation instructions.

6. Availability & Cost
StegoTack Tape is available nationally through our network of building supply distributors. For current cost information, contact your local Stego Wrap distributor or Stego Industries' Sales Representative.

7. Warranty
Stego Industries, LLC believes to the best of its knowledge, that specifications and recommendations herein are accurate and reliable. However, since site conditions are not within its control, Stego Industries does not guarantee results from the use of the information provided and disclaims all liability from any loss or damage. No warranty, express or implied, is given as to the merchantability, fitness for a particular purpose, or otherwise with respect to the products referred to.

8. Maintenance
For longer adhesive life, store in dry, temperate area.

9. Technical Services
Technical advice, custom CAD drawings, and additional information can be obtained by contacting Stego Industries' technical assistance department or via the website. **www.stegoindustries.com**

10. Filing Systems
www.stegoindustries.com
Buildsite

4. Technical Data

TABLE 1: PHYSICAL PROPERTIES OF STEGOTACK TAPE

PROPERTY	RESULTS
Dimensions	50 feet long, 2 inches wide
Total Thickness	30 Mils
Permeance	0.03 perms (30 mils)
Color	Grey
Material	Synthetic rubber blend
Adhesion to Steel	10.3 lbs./in. width ASTM C 1000
Installation Temperature	40°F/110°F (4°C/43°C)
In Service Temperature Range	-20°F/+140°F (-29°C/60°C)
VOC Content	No VOC's, 100% solids

Stego® Term Bar

STEGO INDUSTRIES, LLC

Vapor Retarders
07 26 00, 03 30 00

1. Product Name
Stego Term Bar

2. Manufacturer
Stego Industries, LLC
216 Avenida Fabricante, Suite 101
San Clemente, CA 92672
Sales, Technical Assistance
Ph: (877) 464-7834
Fx: (949) 257-4113
www.stegoindustries.com

3. Product Description
USES: Stego Term Bar is a semi-flexible plastic termination bar used for mechanically securing Stego Wrap or other materials to concrete, masonry, or wood.
COMPOSITION: Stego Term Bar is made from post-industrial recycled PVC.

5. Installation
UNDER SLAB: Nail through Stego Term Bar and Stego Wrap to secure material as needed. If the beveled edge is facing the wall, a pocket/lip is created for mastic/sealant to be used if required. Pre-drilled nail holes are provided every 6 inches for ease of installation.

To cut Stego Term Bar, score with a utility knife or wire snips. Stego Term Bar can be bent back and forth and then broken at desired locations as well. Stego Term Bar is flexible enough to bend around corners and contours in the wall for easy installation.

For additional information, please refer to Stego's complete installation instructions.

6. Availability & Cost
Stego Term Bar is available nationally through our network of building supply distributors. For current cost information, contact your local Stego Wrap distributor or Stego Industries' Sales Representative.

7. Warranty
Stego Industries, LLC believes to the best of its knowledge, that specifications and recommendations herein are accurate and reliable. However, since site conditions are not within its control, Stego Industries does not guarantee results from the use of the information provided and disclaims all liability from any loss or damage. No warranty, express or implied, is given as to the merchantability, fitness for a particular purpose, or otherwise with respect to the products referred to.

8. Maintenance
Store above 60°F. Term Bar will become less flexible at lower temperatures.

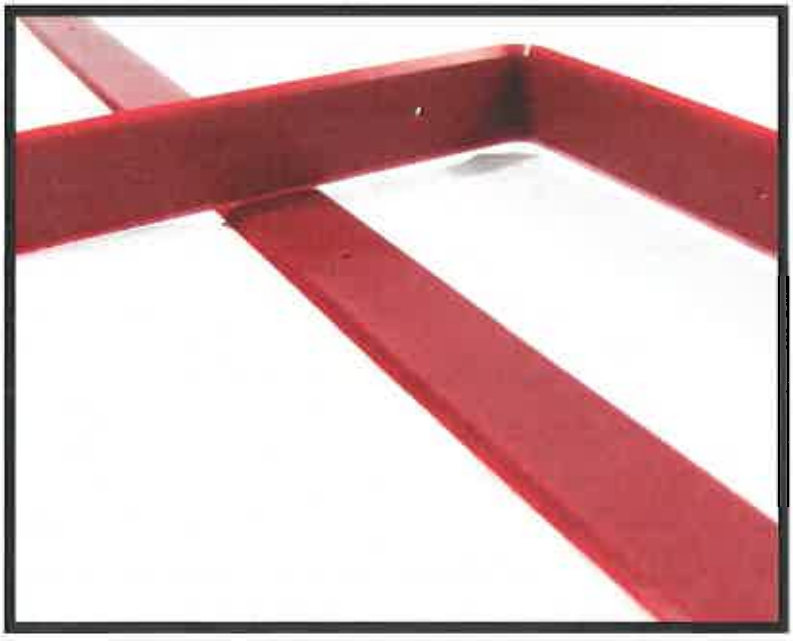
9. Technical Services
Technical advice, custom CAD drawings, and additional information can be obtained by contacting Stego Industries' technical assistance department or via the website. **www.stegoindustries.com**

10. Filing Systems
www.stegoindustries.com

4. Technical Data

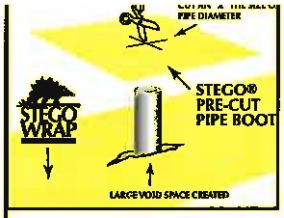
TABLE 1: PHYSICAL PROPERTIES OF STEGO TERM BAR

PROPERTY	RESULTS
Dimensions	4 feet long, 1 1/8 inches wide
Color	Red
Material	Recycled PVC
Weight	4.7 oz. (132 grams)



Stego® Pre-Cut Pipe Boots

STEGO INDUSTRIES, LLC



Vapor Retarders
07 26 00, 03 30 00

1. Product Name
Stego Pre-Cut Pipe Boots

2. Manufacturer
Stego Industries, LLC
216 Avenida Fabricante, Suite 101
San Clemente, CA 92672
Sales, Technical Assistance
Ph: (877) 464-7834
Fx: (949) 257-4113
www.stegoindustries.com

3. Product Description
USES: Stego Pre-Cut Pipe Boots are used to seal around permanent penetrations in Stego Wrap.
COMPOSITION: Stego Pre-Cut Pipe Boots are made from Stego Wrap Vapor Barrier (15-mil), and therefore are manufactured from only high grade prime, virgin, polyolefin resins.
SIZE: Stego Pre-Cut Pipe Boots are 18" by 18" and 15 mils thick. Stego Pre-Cut Pipe Boots ship 10 packs of 25 in a case (250 boots per case).

5. Installation
UNDER SLAB: Cut an "X" the size of the pipe diameter in the center of the Pre-Cut Pipe Boot and slide tightly over pipe. Tape all sides of the pipe boot with Stego Tape. Seal around the base of the pipe using Stego tape and/or Stego Mastic.

For additional information, please refer to Stego's complete installation instructions.

6. Availability & Cost
Stego Pre-Cut Pipe Boots are available nationally through our network of building supply distributors. For current cost information, contact your local Stego Wrap distributor or Stego Industries' Sales Representative.

7. Warranty
Stego Industries, LLC believes to the best of its knowledge, that specifications and recommendations herein are accurate and reliable. However, since site conditions are not within its control, Stego Industries does not guarantee results from the use of the information provided and disclaims all liability from any loss or damage. No warranty, express or implied, is given as to the merchantability, fitness for a particular purpose, or otherwise with respect to the products referred to.

8. Maintenance
None required.

9. Technical Services
Technical advice, custom CAD drawings, and additional information can be obtained by contacting Stego Industries' technical assistance department or via the website. **www.stegoindustries.com**

4. Technical Data

TABLE 1: PHYSICAL PROPERTIES OF STEGO PRE-CUT PIPE BOOTS

PROPERTY	TEST	RESULTS
Under Slab Vapor Retarders	ASTM E 1745 Class A, B & C – Standard Specification for Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs	Exceeds Class A, B & C
Water Vapor Permeance	ASTM F 1249 – Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor	0.0086 perms *0.0036 WVTR
Puncture Resistance	ASTM D 1709 – Test Methods for Impact Resistance of Plastic Film by Free-Falling Dart Method	2266 grams
Tensile Strength	ASTM D 882 – Test Method for Tensile Properties of Thin Plastic Sheeting	70.60 lbf/in.
Permeance After Conditioning (ASTM E 1745 Sections 7.1.2 - 7.1.5)	ASTM E 154 Section 8, F 1249 – Permeance after wetting, drying, and soaking ASTM E 154 Section 11, F 1249 – Permeance after heat conditioning ASTM E 154 Section 12, F 1249 – Permeance after low temperature conditioning ASTM E 154 Section 13, F 1249 – Permeance after soil organism exposure	0.0098 perms 0.0091 perms 0.0097 perms 0.0095 perms
Thickness	ACI 302.1R-04 – Minimum Thickness (10 mils)	15 mils
Pipe Boot Dimensions		18" x 18"

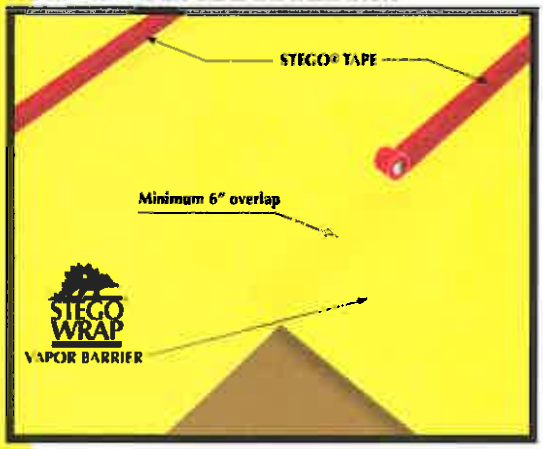
Note: perm unit = grains/(ft² *hr* in.Hg) * WVTR = Water Vapor Transmission Rate

PART 1

STEGO WRAP VAPOR BARRIER/RETARDER INSTALLATION INSTRUCTIONS

IMPORTANT: Please read these installation instructions completely, prior to beginning any Stego Wrap installation. The following installation instructions are based on ASTM E 1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs. If project specifications call for compliance with ASTM E 1643, then be sure to review the specific installation sections outlined in the standard along with the techniques referenced in these instructions.

FIGURE 1: UNDER-SLAB INSTALLATION



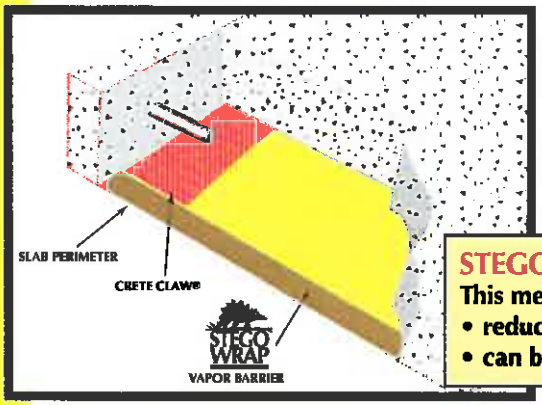
UNDER-SLAB INSTRUCTIONS:

1. Stego Wrap can be installed over an aggregate, sand, or tamped earth base. It is not necessary to have a cushion layer or sand base, as Stego Wrap is tough enough to withstand rugged construction environments.
2. Unroll Stego Wrap over the area where the slab is to be placed. Stego Wrap should completely cover the concrete placement area. All joints/seams both lateral and butt should be overlapped a minimum of six inches and taped using Stego Tape.

NOTE: The area of adhesion should be free from dust, dirt, moisture, and frost to allow maximum adhesion of the pressure-sensitive tape.

3. ASTM E 1643 requires sealing the perimeter of the slab. *Extend vapor retarder over footings and seal to foundation wall, grade beam, or slab at an elevation consistent with the top of the slab or terminate at impediments such as waterstops or dowels.* Consult the structural engineer of record before proceeding.

FIGURE 2a: SEAL TO SLAB AT PERIMETER



SEAL TO SLAB AT PERIMETER:*

NOTE: Clean the surface of Stego Wrap to ensure that the area of adhesion is free from dust, dirt, moisture, and frost to allow maximum adhesion of the pressure-sensitive adhesive.

a. Install Crete Claw® on the entire perimeter edge of Stego Wrap.

b. Prior to the placement of concrete, ensure that the top of Crete Claw is free of dirt, debris, or mud to maximize the bond to the concrete.

STEGO LABOR SAVER!
This method not only complies with ASTM E 1643, but it also:
- **reduces labor compared to other perimeter sealing techniques.**
- **can be used even without an existing wall or footing, unlike alternatives.**

FIGURE 2b: SEAL TO PERIMETER WALL

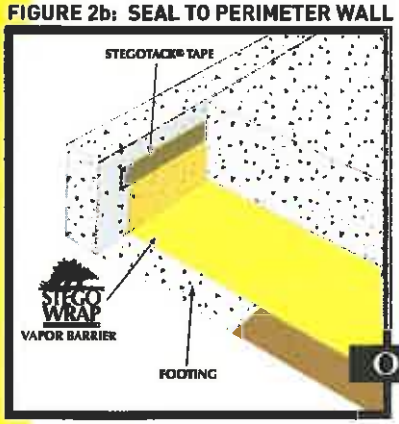
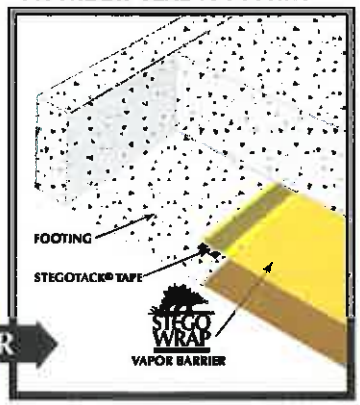


FIGURE 2c: SEAL TO FOOTING



OR

OR SEAL TO PERIMETER WALL OR FOOTING WITH STEGOTACK® TAPE:*

a. Make sure area of adhesion is free of dust, dirt, debris, moisture, and frost to allow maximum adhesion.

b. Remove release liner on one side and stick to desired surface.

c. When ready to apply Stego Wrap, remove the exposed release liner and press Stego Wrap firmly against StegoTack Tape to secure.

* If ASTM E 1643 is specified, consult with project architect and structural engineer to determine which perimeter seal technique should be employed for the project.

NOTE: Stego Industries, LLC's ("Stego") installation instructions are based on ASTM E 1643 - *Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.* These instructions are meant to be used as a guide, and do not take into account specific job site situations. Consult local building codes and regulations along with the building owner or owner's representative before proceeding. If you have any questions regarding the above mentioned installation instructions or Stego products, please call us at 877-464-7834 for technical assistance. While Stego employees and representatives may provide technical assistance regarding the utility of a specific installation practice or Stego product, they are not authorized to make final design decisions.

 04/2013

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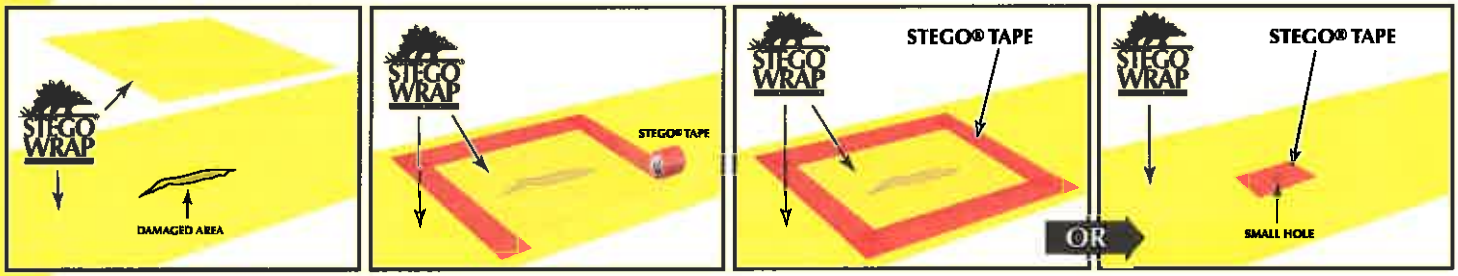
4. In the event that Stego Wrap is damaged during or after installation, repairs must be made. Stego Tape can be used to repair small holes in the material. For larger holes, cut a piece of Stego Wrap to a size and shape that covers any damage by a minimum overlap of six inches in all directions. Clean all adhesion areas of dust, dirt, moisture, and frost. Tape down all edges using Stego Tape (see figure 3, Sealing Damaged Areas).

FIGURE 3: SEALING DAMAGED AREAS



5. **IMPORTANT: ALL PENETRATIONS MUST BE SEALED.** All pipe, ducting, rebar, wire penetrations and block outs should be sealed using Stego Wrap, Stego Tape and/or Stego Mastic (see figure 4a, Pipe Penetration Sealing).

FIGURE 4a: PIPE PENETRATION SEALING

STEGO WRAP PIPE PENETRATION REPAIR DETAIL:

1: Install Stego Wrap around pipe penetrations by slitting/cutting material as needed. Try to minimize the void space created.

2: If Stego Wrap is close to pipe and void space is minimized then seal around pipe penetration with Stego Tape and/or Stego Mastic.

(See Figure 4a)

3: If detail patch is needed to minimize void space around penetration, then cut a detail patch to a size and shape that creates a six inch overlap on all edges around the void space at the base of the pipe. Stego Pre-Cut Pipe Boots are also available to speed up the installation.

4: Cut an "X" the size of the pipe diameter in the center of the pipe boot and slide tightly over pipe.

5: Tape down all sides of the pipe boot with Stego Tape.

6: Seal around the base of the pipe using Stego Tape and/or Stego Mastic.

(See Figure 4b)

FIGURE 4b: DETAIL PATCH FOR PIPE PENETRATION SEALING

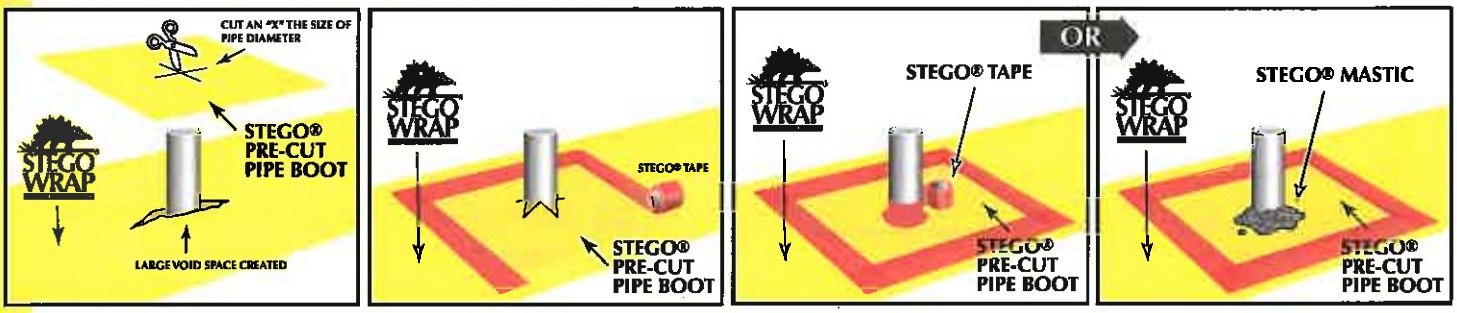
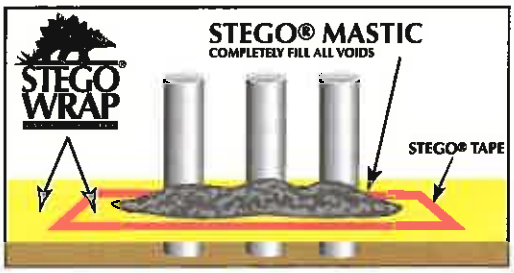


FIGURE 5: MULTIPLE PIPE PENETRATION SEALING



MULTIPLE PIPE PENETRATION SEALING:

Multiple pipe penetrations in close proximity and very small pipes may be sealed using Stego Wrap and Stego Mastic for ease of installation (see figure 5, Multiple Pipe Penetration Sealing).

NOTE: Stego Industries, LLC's ("Stego") installation instructions are based on ASTM E 1643 - *Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.* These instructions are meant to be used as a guide, and do not take into account specific job site situations. Consult local building codes and regulations along with the building owner or owner's representative before proceeding. If you have any questions regarding the above mentioned installation instructions or Stego products, please call us at 877-464-7834 for technical assistance. While Stego employees and representatives may provide technical assistance regarding the utility of a specific installation practice or Stego product, they are not authorized to make final design decisions.

 04/2013

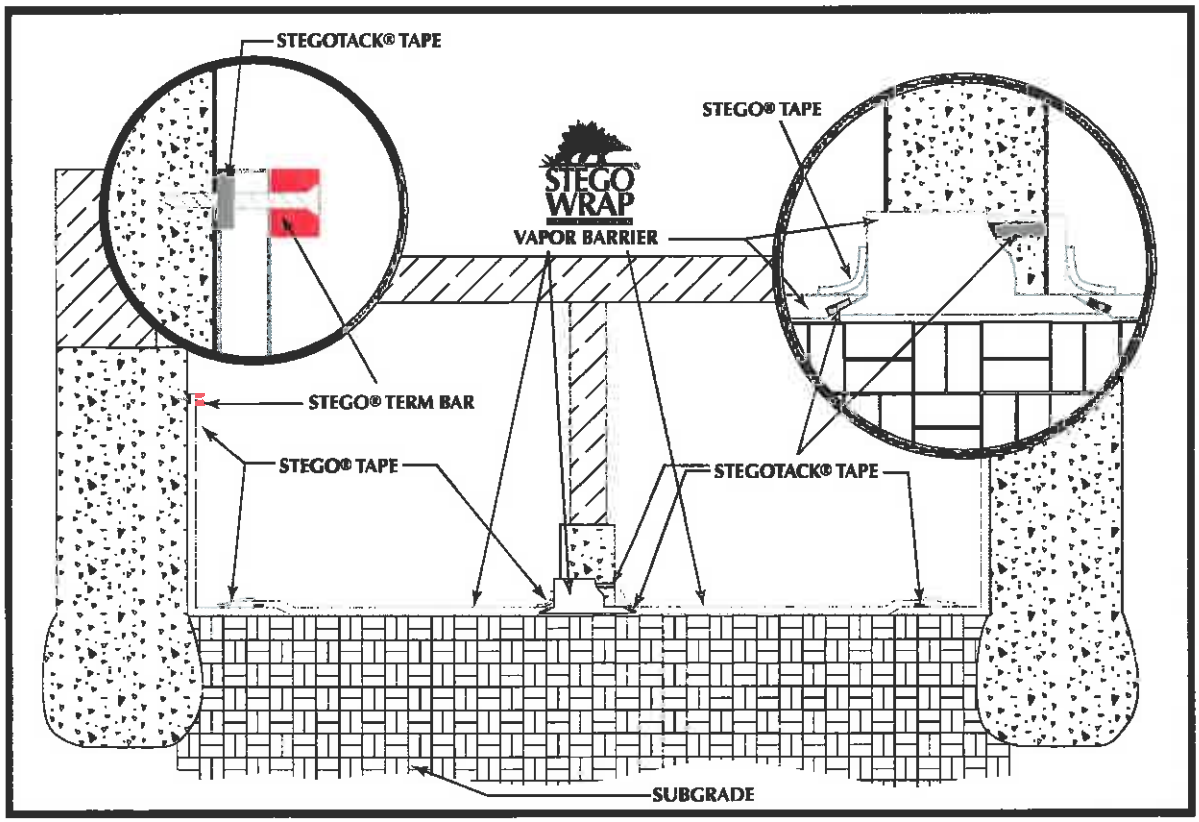
PART 2

STEGO WRAP VAPOR BARRIER/RETARDER INSTALLATION INSTRUCTIONS

CRAWL SPACE INSTALLATION INSTRUCTIONS:

1. Turn Stego Wrap up the foundation wall to a minimum height of six inches above the outside/exterior grade or in compliance with local building codes and terminate with Stego Term Bar. To form a complete seal, apply StegoTack Tape or a layer of Stego Mastic to the foundation wall prior to installing Stego Term Bar. Allow one hour for Stego Mastic to cure prior to installing Stego Term Bar.
2. Seal Stego Wrap around all penetrations and columns using Stego Tape, StegoTack Tape, and/or Stego Mastic.
3. Place Stego Wrap directly over the crawl space floor. If rigid insulation is to be used, install Stego Wrap prior to insulation (under insulation and between the foundation wall and insulation).
4. Overlap seams a minimum of six inches and seal with Stego Tape. Some codes require a minimum of a twelve inch overlap. Check appropriate codes prior to installation.

FIGURE 6: CRAWL SPACE INSTALLATION



NOTE: Stego Wrap Vapor Barrier and Stego Tape are both available in white (as shown in illustration above).

INSTALLATION TIP:

1. For a cleaner look and to prevent against tenting of Stego Wrap at the foundation wall/foundation floor intersection, consider mechanically fastening Stego Wrap to base of foundation wall in addition to the above mentioned wall termination.

NOTE: Stego Industries, LLC's ("Stego") installation instructions are based on ASTM E 1643 - *Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.* These instructions are meant to be used as a guide, and do not take into account specific job site situations. Consult local building codes and regulations along with the building owner or owner's representative before proceeding. If you have any questions regarding the above mentioned installation instructions or Stego products, please call us at 877-464-7834 for technical assistance. While Stego employees and representatives may provide technical assistance regarding the utility of a specific installation practice or Stego product, they are not authorized to make final design decisions.

 04/2013

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ATTACHMENT D
INSTALLATION OF STEGO VAPOR BARRIER PHOTO PLATES

Photo 1. Stego barrier extending under perimeter footing.

Photo 2. Stego vapor barrier installed under utility vault south of northern building.

Photo 3. Stego vapor barrier extending beneath perimeter concrete footing of northern building.

Photo 4. Seams taped.

Photo 5. Seams taped

Photo 6. Pipe penetrations taped.

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PHOTO PLATE 1.
Installation of Stego Vapor Barrier
Madison Development Group, LLC Property
Smokey Point, WA

Photo 7. Pipe penetration taped.

Photo 8. Overlapping seams taped.

Photo 9. Placing layer of 10-mil visqueen over stego vapor barrier.

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PHOTO PLATE 2.
Installation of Stego Vapor Barrier
Madison Development Group, LLC Property
Smokey Point, WA