



103 Montgomery Street
P.O. Box 29052
San Francisco, CA 94129-0052
T (415) 561-5300
www.presidio.gov

August 30, 2019

Mr. Jeff White
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, California 94612

Subject: Construction Completion Report – Vapor Mitigation System
Building 127B Riley Avenue
Section BR11-1 Fuel Distribution System
Riley Avenue, Presidio of San Francisco, San Francisco, California

Dear Mr. White:

Enclosed is the *Construction Completion Report Vapor (CCR) Mitigation System Building 127B Riley Avenue* prepared by TRC Solutions, Inc., on behalf of the Presidio Trust (Trust). This CCR documents the installation of the Vapor Mitigation System in Building 127B in accordance to the approved *Revised Vapor Mitigation Design* dated March 5, 2019 (TRC, 2019¹) and to address impacted soil vapor intrusion. The CCR also presents the results of the first post-construction soil vapor intrusion confirmation sampling. The *Operation, Monitoring and Maintenance Plan (OMMP)* referenced in the CCR is being prepared and will be submitted to RWQCB under separate cover.

The Trust looks forward to RWQCB review and approval of the CCR. Should you have questions or need additional information, please contact me at (415) 561-5421.

Sincerely,

Nina Larssen
Remediation Program Manager

cc: Alfonso Ang, TRC
Justin Hanzel-Durbin, TRC
Sally Schoemann, TRC

Attachment:

Construction Completion Report, Vapor Mitigation System, Building 127B Riley, Section BR11-1 Fuel Distribution System, Riley Avenue, Presidio of San Francisco, San Francisco, California

¹TRC. 2019. *Revised Vapor Mitigation System Design, Building 127B Riley Avenue, Section BR11-1, Fuel Distribution System, Riley Avenue, Presidio of San Francisco, San Francisco, California*. March 5



Construction Completion Report
Vapor Mitigation System
Building 127B Riley Avenue
Section BR11-1
Fuel Distribution System
Riley Avenue
Presidio of San Francisco, San Francisco, California

August 30, 2019

This document has been prepared for:

The Presidio Trust
103 Montgomery Street
San Francisco, California 94129

Project No. 285830



A handwritten signature in blue ink, appearing to read "Alfonso Ang".

Alfonso Ang, PE
Senior Engineer / Project Manager

A handwritten signature in blue ink, appearing to read "Justin Hanzel-Durbin".

Justin Hanzel-Durbin, EIT
Senior Engineer

TABLE OF CONTENTS

1.0 INTRODUCTION..... 1

 1.1 Site Description 1

 1.2 BR11-1 Environmental Investigation and Remedial History.....2

 1.3 Conceptual Site Model 3

2.0 CHEMICALS OF CONCERN AND SCREENING LEVELS.....5

3.0 VAPOR INTRUSION MITIGATION OBJECTIVES5

4.0 VAPOR MITIGATION SYSTEM CONSTRUCTION.....6

 4.1 Vapor Mitigation System Construction Permitting and Approvals6

 4.2 Vapor Mitigation System Construction.....6

 4.2.1 Sub-Slab Venting System Construction..... 7

 4.1.2 Vapor Barrier Construction8

 4.1.3 Concrete Slab Construction..... 8

 4.1.4 Drainage System Construction.....8

5.0 POST-CONSTRUCTION VAPOR INTRUSION SAMPLING 8

 5.1 Sub-Slab Venting Sampling 9

 5.2 Indoor and Ambient Air Sampling Activities 9

 5.3 Quality Assurance/Quality Control 9

 5.4 Analytical Results 9

 5.4 Analytical Results Discussion 10

6.0 POST-CONSTRUCTION VMS OPERATION AND MAINTENANCE, REPORTING,
AND SCHEDULE 11

7.0 CONCLUSION 13

8.0 REFERENCES 13

Figure 1 – Site Map

Figure 2 – Site Plan

Figure 3A – 127B Sub-Slab Venting System Plan

Figure 3B – 127B Sub-Slab Venting System Details

Figure 4 – Post-Construction 127B Sub-Slab Venting and Indoor Air Sampling Locations

Figure 5 – Ambient Air Sampling Locations

Table 1 – Sub-Slab Vapor Analytical Results – Buildings 127A and 127B – Riley Avenue

Table 2 – Indoor Air Analytical Results - Building 127B – Riley Avenue

Table 3 – Ambient Air Analytical Results – Riley Avenue

Attachment A – VMS RWQCB Approval

Attachment B – Trust “N2” Compliance Approvals

Attachment C – Vapor Mitigation System Materials and Equipment Specifications

Attachment D – As-Built Drawings

Attachment E – Construction Photographs

Attachment F – Laboratory Analytical Reports

ABBREVIATIONS AND ACRONYMS

bgs	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CCR	Construction Completion Report
COC	Chemical of Concern
CSM	Conceptual Site Model
CUL	Cleanup Level
EKI	Erler & Kalinowski
EPA	Environmental Protection Agency
ESL	Environmental Screening Level
FDS	Fuel Distribution System
GTR	gas transmission rate
IC	Institutional Controls
IT	IT Corporation
LEL	Lower Explosive Limit
LL	Low Level
LUC	Land Use Control
LUN	Land Use Notification
$\mu\text{g}/\text{m}^3$	Microgram per Cubic Meter
$\mu\text{g}/\text{L}$	Milligrams per Liter
mg/kg	Milligrams per Kilogram
NFA	No Further Action
Presidio	Presidio of San Francisco
PVC	Polyvinyl Chloride
RD	Remedial Design
RWQCB	Regional Water Quality Control Board
SIM	Selective Ion Mode
SSVS	Sub-Slab Venting System
SVI	Soil Vapor Intrusion

TPH-d	Total Petroleum Hydrocarbons as Diesel
TPH-g	Total Petroleum Hydrocarbons as Gasoline
TPH-mo	Total Petroleum Hydrocarbons as Motor Oil
Trust	Presidio Trust
TRC	TRC Solutions, Inc.
U.S.	United States
VIMO	Vapor Intrusion Mitigation Objective
VMS	Vapor Mitigation System

CONSTRUCTION COMPLETION REPORT
VAPOR MITIGATION SYSTEM
BUILDING 127B RILEY AVENUE
SECTION BR11-1
FUEL DISTRIBUTION SYSTEM
RILEY AVENUE, PRESIDIO OF SAN FRANCISCO
SAN FRANCISCO, CALIFORNIA

1.0 INTRODUCTION

TRC Solutions, Inc. (TRC) on behalf of the Presidio Trust (the Trust) has prepared this Construction Completion Report (CCR) for the installation of a soil vapor mitigation system (VMS) to address potential soil vapor intrusion (SVI) risk in Building 127B located at Riley Avenue, at the Presidio of San Francisco (Presidio), California. The installed VMS mitigates SVI risks resulting from the fuel oil release at Section BR11-1 of the former Fuel Distribution System (FDS) that serviced Building 127B. The installed mitigation action consists of the following elements:

- Installation of a passive, wind powered, sub-slab venting system (SSVS) and vapor barrier beneath the basement of Residential Building 127B
- Installation of a new concrete basement at Building 127B
- Post-construction monitoring to verify acceptable indoor air concentrations (first sampling)

The construction of the VMS and first SVI sampling were conducted in accordance with the design and procedures presented in the *Revised Vapor Mitigation System Design, Building 127B Riley Avenue (Revised VMS Design, TRC 2019a)* dated March 5, 2019, and approved by the Regional Water Quality Control Board (RWQCB) on March 8, 2019 (RWQCB, 2019b). A copy of the received RWQCB approval letter is included as **Attachment A**. This CCR also presents the results of the first post-construction SVI investigation at 127B.

This CCR describes and documents the construction of the VMS and first post-construction sampling at Building Unit 127B. The following sections present a site description, overview of remedial history leading to the installation of the VMS, construction of the VMS, and first post-construction SVI investigation.

1.1 Site Description

Former FDS Section BR11-1 (the Site) is located in the Main Post Area of the Presidio of San Francisco (Presidio), San Francisco, California (**Figure 1**). Section BR11-1 serviced boilers in the basements of residential Buildings 127A/B, 128A/B, and 129A/B on the west side of Riley Avenue.

1.2 BR11-1 Environmental Investigation and Remedial History

A summary of environmental investigation and remedial actions associated with BR11-1 is presented below.

The FDS was substantially removed by the U.S. Army between 1996 and 1999. Documentation of the removal activities and associated confirmation sampling is presented in the three-volume report, titled *Fuel Distribution System Closure Report, Presidio of San Francisco, California*, prepared by IT Corporation (IT) and dated May 1999 (IT, 1999).

On January 27, 2006, the Presidio Trust submitted the *FDS Closure Certification Report – Phase 1* to the RWQCB requesting closure of 27 FDS sections, including Section BR11-1 (Trust, 2006). On September 16, 2009, the RWQCB determined that no further action (NFA) was required (RWQCB, 2009).

In May 2017, soil contaminated with total petroleum hydrocarbons as diesel (TPH- d) was discovered during maintenance work in the basement of residential Building 127B. After notifying the RWQCB of the discovery, the Trust implemented interim remedial measures in accordance with the established *Petroleum Contingency Plan* (EKI, 2004), including initial soil and groundwater sampling to characterize the area of impact, limited excavation of impacted soil, placement of oxygen release compound within the excavation, and backfill with clean soil.

Based on information about the fuel release discovery provided by the Trust, the RWQCB re-opened FDS Section BR11-1 in an email dated July 20, 2017 (RWQCB, 2017a). RWQCB directed the Trust to prepare a work plan to further assess the fuel release for all the buildings potentially affected by the release.

In October 2017, the Trust performed soil, sub-slab vapor, and groundwater sampling in accordance with the September 14 *Work Plan* (TRC, 2017a) and the revised soil and soil vapor investigation approach for Building 128A, sent via email to RWQCB on October 10, 2017. The results of the investigation were submitted to the RWQCB in an *Interim Update Report* (TRC, 2017b). Soil and groundwater sampling locations are presented in **Figure 2**.

On November 13, 2017, the Trust implemented interim measures at Building 127B. The interim measures consisted of the installation of a 15-mil, Stego® vapor barrier over the entire exposed basement floor and 4-inch ventilation fan. The fan exhaust was routed to the outside of the building through the existing chimney flue. The 100 cubic feet per minute nominally rated ventilation fan is set to automatically run for 1.5 hours with 1-hour off intervals. The Stego® vapor barrier was removed in April 2018 to allow installation of permeable gravel layer and provide a dry, stable walking surface. The vapor barrier was not replaced, but the ventilation fan remains in operation.

On November 29, 2017, the RWQCB issued a letter to the Trust requiring submittal of a soil vapor intrusion work plan for Buildings 127A, 128A, and 129B. A review of available building information including building information sheets and floor plans along with a building survey of Buildings 127A, 128A, and 129B on December 4, 2017, were performed to identify potential vapor migration pathways and select proposed sampling locations.

In December 2017 and March 2018, the Trust prepared and submitted workplans to investigate potential SVI in Buildings 127A, 128A, 129B from the abandoned FDS lines beneath the buildings (*VI Work Plan* and *Addendum*, TRC, 2017c and 2018a), and extent of soil and groundwater impacts resulting from the fuel oil release beneath 127B (*Supplemental Site Investigation Work Plan*, TRC, 2018b).

Between February and July 2018, the Trust implemented the *VI Work Plan* and *Supplemental Site Investigation Work Plan* and submitted investigation results in subsequent update reports and request for concurrence and no-further-action (NFA) determination (TRC, 2018c, 2018d, and 2018e). Based on presented investigation results, the RWQCB issued concurrence that no further evaluation of SVI for Buildings 128B and 129A (RWQCB, 2018a), 128A and 129B, (RWQCB, 2018b) and 127A (RWQCB, 2018c) was warranted. Soil and groundwater sampling locations to date are presented in **Figure 2**.

In October 2018, the Trust submitted a Remedial Design – Vapor Mitigation System for Building Unit 127B (TRC, 2018f). RWQCB provided comments on the submitted remedial design in a comment letter dated January 3, 2019 and approved the commencement of VMS construction via email on January 10, 2019. Based on the received comments, the Trust prepared and submitted a *Revised VMS Design* (TRC, 2019) in March 2019 which was approved by RWQCB on March 8, 2019 (RWQCB, 2019b).

1.3 Conceptual Site Model

The Conceptual Site Model (CSM) was presented in the *Revised VMS Design* and updated in the *Revised Supplemental Site Investigation Report* (TRC, 2019b) as follows:

- Benzene, TPH-d, TPH-g, and methane impacted sub-slab soil vapors have been detected beneath 127A and are likely present beneath 127B. The impacted sub-slab vapor beneath 127A has not resulted in an unacceptable SVI risk based on soil vapor intrusion investigations completed to date.
- Ambient air concentrations for identified chemicals of concern (COCs) are significantly greater than those reported in indoor air.
- Soil containing residual TPH-d is known to be present directly beneath the basements of Buildings 127A (based on sub-slab vapor data), 127B, and 128A serviced by BR11-1. Residual TPH-d soil impacts were also detected in subsurface soils to the southeast of Buildings 127A and 127B: confined laterally to the front yards and vertically between 5 and 30 ft below ground surface (bgs). No soil contamination was detected in soil samples collected from the surface to 50 ft bgs to the southwest, northwest and northeast of 127A and 127B. Similarly, no soil

contamination was detected in samples collected from the surface to 50 ft bgs to the southeast, northeast and northwest of Building 128A.

- Subsurface soils have generally been characterized as lean clay with interbedded sands down to 35 to 40 ft bgs at the southwest area of the Site beneath Buildings 127A and 127B and increasing down to the northeast to at least 50 ft bgs beneath Building 128A. Soil boring data indicates bedrock is encountered starting at 35 ft bgs beneath buildings 127A and 127B. No bedrock was encountered down to 50 ft bgs beneath 128A. Shallow soils around the basement walls and beneath the basement concrete slab are generally moist and, in some cases, perched water has been observed directly below and adjacent to the slab.
- TPH-d was originally identified southeast of Building 127B in water encountered at 27 ft bgs. However, TPH-d analytical results from collected grab groundwater and installed monitoring wells samples were either below screening levels, or, above screening levels but, at a lower magnitude than what was detected southeast of Building 127B at 27 ft bgs in soil boring SB004. TPH-d detections in groundwater above screening levels have been identified northeast and east of Building 127A, southeast of Building 127B, and southeast of Building 128A in water encountered between 23 and 57 ft bgs. However, based on chromatograph review, the detected TPH-d is suspected to be primarily biogenic origin and not petroleum hydrocarbon. Annual groundwater monitoring is scheduled to continue at the Site to further evaluate groundwater impacts
- Depth to groundwater at the southwest area beneath 127B where the bedrock high is located ranges from 23.30 ft (BR11-1GW01) to 34.06 ft (BR11-1GW03) bgs with calculated elevations of 58.48 and 47.65 ft (referenced to the North American Vertical Datum of 1988 [NAVD 88]), respectively. Depth to groundwater elevation declines to a measured depth of 56.88 ft bgs (BR11-1GW02) with elevation of 19.15 ft towards the northeast where the bedrock high was no longer present. Groundwater data from installed groundwater monitoring wells on Site and other nearby Presidio groundwater monitoring locations, indicates the direction of groundwater flow is to the north. Currently groundwater is not a human health risk due to the exposure pathway being incomplete as groundwater is not used as a source of water (potable or non-potable) for the Presidio (TRC, 2017c).
- Site lithology contains impermeable layers above bedrock, which creates localized lenses of perched groundwater; this is observed at locations SB004, GW01, and GW03, which show groundwater elevations approximately 30 ft to 40 ft above the local laterally-continuous water-bearing zone.
- Fate and transport of secondary source groundwater impacts include potential downgradient migration due to advection and, to a lesser degree, diffusion and dispersion. However, due to the presence of the perched lens, impacted groundwater at locations SB004 and GW-01 are most likely hydraulically disconnected from local laterally continuous groundwater bodies.
- An additional secondary source impact is contaminant vapors releasing from impacted subsurface soil. These vapors migrate through the vadose zone, through preferential paths of least resistance, and can exit through the soil-atmosphere boundary or into overlaying buildings. Soil vapor intrusion (SVI) investigations

have been conducted indicating no unacceptable human health risk from SVI is present in Buildings 127A, 128A/B and 129A/B.

- Potential human receptors include existing and future residential tenants and the occasional maintenance worker. However, residual soil contaminations is at depth and exposure is mitigated by existing overlaying hardscape (concrete slabs) and landscaping (un-impacted soil).
- Potential ecological receptors included the Crissy Field Marsh and the San Francisco Bay; via transport of contaminants through existing stormwater utilities lines or groundwater transport. However, identified lateral and vertical extents of soil impacts did not intersect known storm water lines servicing Riley Avenue. Groundwater transport is not considered an ecological exposure pathway due to the larger distance (0.25 miles) between the Site and Crissy Field Marsh and reported groundwater contaminant concentrations are below Aquatic Habitat Environmental Screening Levels (ESL). As such, the exposure pathway for ecological receptors is considered incomplete.

2.0 CHEMICALS OF CONCERN AND SCREENING LEVELS

The following are the identified as SVI COCs:

- **Sub-Slab/Soil Vapor:** TPH-d, TPH-g, benzene, and methane are identified as COCs in soil vapor beneath 127A and beneath 127B. Maximum reported concentrations beneath 127A are 39,000 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) for TPH-d, 190,000 $\mu\text{g}/\text{m}^3$ for TPH-g, 21 $\mu\text{g}/\text{m}^3$ for benzene, and 2.01% by volume for methane. Maximum reported concentrations detected in the sample collected from 127B VMS vent riser are 10,000 $\mu\text{g}/\text{m}^3$ for TPH-d and 11 $\mu\text{g}/\text{m}^3$ for benzene.

3.0 VAPOR INTRUSION MITIGATION OBJECTIVES

The vapor intrusion mitigation objectives (VIMOs) are media-specific goals for protecting human health and the environment. Considering the current and planned future land use, the VIMOs for the Site are:

1. Mitigate SVI risk and unacceptable human health risk to future occupants of 127B and adjacent 127A as follows:
 - a. Maintain indoor air SVI COC concentrations at acceptable levels; as reported in previously conducted investigations that have not resulted in an unacceptable risk to human health (TRC, 2018e and RWQCB, 2018c)
 - b. Verify indoor air SVI COC concentrations remain at acceptable indoor air levels via two post-construction indoor air monitoring events for 127B and

between periods of occupancy (inter-occupancy) indoor air sampling thereafter for 127A and 127B.

- c. Comply with Land Use Control (LUCs) regarding property use, mitigation measures, and monitoring for 127A and 127B.

The first round of post-construction indoor air data for 127B was evaluated against the screening levels established for the Site, followed by an evaluation of background levels reported during the initial site investigation conducted in 127A, 128A, and 129B. Long-term inter-occupancy data will be evaluated using statistical methods (i.e. Mann-Kendall or equivalent) to determine trends in indoor air COC concentrations. Post-construction sampling was conducted following protocols implemented during previous soil vapor intrusion investigations (TRC, 2017c and 2018a). Procedures to evaluate the long-term data and response actions are detailed in the VMS Operation, Maintenance, and Monitoring Plan (OMMP). The OMMP is under preparation and will be submitted to the RWQCB under separate cover.

4.0 VAPOR MITIGATION SYSTEM CONSTRUCTION

The installed VMS for 127B consists of a passive (wind driven) sub-slab venting system (SSVS), vapor barrier beneath the basement, and fiber-reinforced concrete slab basement floor. The SSVS provides passive fresh air venting and limits accumulation of soil vapors beneath the basement slab. The vapor barrier creates a physical barrier that has low permeability to soil vapor beneath the concrete slab. Although not part of the VMS system, the concrete slab does effectively act as a secondary barrier. The following sub-sections present the installation of the VMS system (SSVS and vapor barrier) and the installation of the concrete slab.

4.1 Vapor Mitigation System Construction Permitting and Approvals

The 127B VMS installation underwent a National Environmental Policy Act (NEPA) and National Historic Preservation Act (NHPA) (collectively referred as “N2”) review by the Trust Compliance Division. The project was determined not to represent significant adverse effects on public health, safety, the environment, or to historic properties in Area B of the Presidio. The project received Categorical Exclusion (NEPA review) and Certificate of Compliance (NHPA review) on November 19, 2018. Copies of the issued documents are presented as **Attachment B**.

RWQCB concurrence of the VMS design and approval to proceed with construction was granted on January 10, 2019 via email. Final approval of the *Revised VMS Design* was received on March 8, 2019.

4.2 Vapor Mitigation System Construction

Construction of the VMS was conducted in stages between January 21 and March 15, 2019. Sub-slab venting piping and vapor barrier installation was conducted between January 21 and February 12, concrete slab installation was completed on February 27, and

above surface venting piping between March 14 and March 15, 2019. Mitigation system operation began on March 15, 2019 with the completion of the above ground piping.

The RWQCB was notified of the commencement of VMS system installation on January 22, 2019, via email.

VMS construction was performed by Engineering/Remediation Resources Group, Inc. (ERRG) and concrete subcontractor McGuire and Hester under contract with the Trust and supervised by TRC. Selected VMS construction photographs are presented in **Attachment E**.

4.2.1 Sub-Slab Venting System Construction

Sub-slab venting system installation consisted of the following elements:

- Permeable base layer consisting of approximately four inches of crushed aggregate placed continuously beneath the vapor barrier with the following gradation specifications:

Sieve Size	Percentage Passing Sieve
1 inch	100
3/4 inch	86
1/2 inch	18
3/8 inch	5
No. 4 (4.75 mm)	2
No. 8 (2.36 mm)	2

The crushed aggregate was sourced from Vulcan Materials Company Pleasanton Plant. A copy of the aggregate specification is included in **Attachment C**.

- SSVS venting (fresh air) and collection piping were constructed of high-density polyethylene (HDPE), pre-fabricated, low-profile (flat), three-dimensional vent cores wrapped in non-woven, needle-punched filter fabric. The sub-slab piping was installed directly on top of the aggregate base and beneath the vapor barrier. The flat vent piping was connected to round horizontal and vertical vent risers via custom transition fittings designed to connect to round piping. The horizontal and vertical round piping was constructed using 4-inch, schedule 80, polyvinyl chloride (PVC) piping and fittings. The vertical 4-inch PVC piping vent riser penetrating the vapor membrane and foundation slab were sealed in accordance with the vapor barrier manufacturer's recommendations. The fresh air intake was installed through the existing eastern basement window and terminated on the outside with inlet protected with a steel mesh. The vapor collection vent riser was routed to the roof through the interior of the existing chimney flue and terminated above the installed custom manufactured cooper chimney cap. A steel, wind-driven turbine fan was installed at the top of the riser vent to provide wind siphoning flow from the vent.

SSVS details are presented in **Figures 3A and 3B** and as-built drawings included as **Attachment D**. Pre-fabricated vapor flat piping and turbine fan data sheets and specifications are included in **Attachment C**.

4.1.2 Vapor Barrier Construction

A vapor barrier consisting of approximately 750 square feet of 15 mil-thick, Stego® was installed on top of the permeable base layer and SSVS. The vapor barrier was installed over the entire basement footprint. Vapor barrier layers were laid down with minimum 6-inches overlap and seams sealed using Stego® Tape. SSVS pipe penetrations were sealed using a combination of Stego® Tape and Stego® Mastic per manufacture's recommendations.

4.1.3 Concrete Slab Construction

A new basement floor was installed on top of the installed SSVS and vapor barrier consisting of nominal four-inch thick, fiber mesh reinforced concrete slab with trowel finish.

The concrete was installed as a monolithic, single-pour slab, spanning the entire basement footprint and included trench drain channels and collection sumps. Control joints 0.25 inch wide by 1.0-inch deep and smooth troweling of the concrete surface was completed using manual tools. The concrete was allowed to cure for 14 days before continuing the installation of the VMS. The fiber reinforced concrete was supplied by Central Concrete Supply Company. A copy of the concrete mix specifications is included in **Attachment C**.

4.1.4 Drainage System Construction

A drainage system was installed as part of the concrete slab restoration to capture seeped water and prevent accumulation of water in the subgrade during periods of precipitation. The drainage system consisted of a perimeter trench drain along the northern, western, and southern walls of the basement and two collection sump basins equipped with automatic sump pumps.

The drainage system was installed by Trust Maintenance personnel prior to the concrete slab installation. The drainage system installation was not supervised by TRC.

5.0 POST-CONSTRUCTION VAPOR INTRUSION SAMPLING

The Trust conducted the first of two scheduled post-construction samplings at 127B between April 2 and 3, 2019. The post-construction sampling was performed to confirm VIMO were achieved and to document that indoor air SVI COC concentrations are at acceptable indoor air levels and the fuel oil release has not resulted in an unacceptable risk to future occupants. The following sections describes the conducted SVI investigation.

5.1 Sub-Slab Venting Sampling

The Trust collected a sub-slab venting system vapor sample from installed vent riser sampling port on April 2, 2019, concurrent with the indoor air samples. Sub-slab venting system sampling was conducted using laboratory supplied 1-liter vacuum canisters (i.e., SUMMA canisters) and sorbent tubes. Collected SUMMA canister sample was submitted to Eurofins Calscience (Calscience) in Garden Grove, California, and sorbent tubes samples to Eurofins Air Toxics (Air Toxics) in Fullerton, California. Summa canister was analyzed for benzene, toluene, ethyl benzene, xylenes (BTEX) and naphthalene analysis by US EPA Method TO-15, total petroleum hydrocarbon as gasoline (TPH-g) by TO-3M Low Level and helium and fixed gases (carbon dioxide, carbon monoxide, methane, nitrogen, and oxygen) by ASTM D-1946. Sorbent tube samples were analyzed for TPH-d and TPH-g by TO-17. Location of vent riser sampling location is presented in **Figures 3B and 4**.

5.2 Indoor and Ambient Air Sampling Activities

Indoor air samples were collected from the basement, kitchen, sunroom and second-floor bedroom (nearest the bathroom) in 127B. Ambient air samples were collected at three locations sampled during previous investigation. The three ambient air locations were south of Building 127B, southeast of Building 129B, and northwest of Building 128A near Lincoln Boulevard. located to the south and south east of the residential units. Collected SUMMA canister air samples were submitted to Calscience for BTEX and naphthalene analysis by TO-15SIM, TPH-g by TO-03LL, and fixed gases. Sorbent tube samples were submitted to Air Toxics for TPH-g and TPH-d analysis by TO-17. Locations of indoor air and ambient air samples are presented in **Figures 4 and 5**, respectively.

5.3 Quality Assurance/Quality Control

A 10-minute shut-in test was conducted in the sampling line between the vent riser sampling port and the SUMMA canister. No measurable drop in the starting vacuum of approximately 30 inches of mercury was observed during the duration of the shut-in test.

Field quality control samples collected during the 127B SVI investigation included two field duplicates consisting of one duplicate SUMMA canister and one sorbent tube. Both duplicate samples were collected concurrently with the primary sample using dedicated sampling equipment. Both duplicate samples were collected from the basement during the sampling event. Two additional field blank sorbent tube samples were collected from the basement of 127B and at outdoor sampling location BR11-1AA03. The collected field blanks were analyzed for TPH-g and TPH-d by TO-17. Reported analytical results for both field blanks were non-detect above specified laboratory reporting limits.

5.4 Analytical Results

Analytical results from the SVI investigation were compared to current Tier 1 ESLs for sub-slab vapors and current Tier 1 and Residential ESLs (RWQCB, 2019a) for indoor air

and are presented in the following sections. Laboratory analytical reports are included as **Attachment F**.

Sub-slab Venting System Vapor – Benzene and TPH-d were detected above screening levels in sample 127BSSV01 collected from the sub-slab venting system sampling port with reported concentrations of $11 \mu\text{g}/\text{m}^3$ for benzene and $10,000 \mu\text{g}/\text{m}^3$ for TPH-d. TPH-g reported $2,000 \mu\text{g}/\text{m}^3$ concentration is below current Tier 1 ESL for sub-slab vapor and methane was non-detect above the 0.5% reporting limit. No other detected compounds were above their respective Tier 1 ESL. Analytical results are tabulated in **Table 1** and presented in **Figure 4**.

Indoor Air - Benzene was detected in all collected samples ranging from $0.21 \mu\text{g}/\text{m}^3$ to $0.31 \mu\text{g}/\text{m}^3$. TPH-d was non-detect in the basement sample and ranged from 130 to $180 \mu\text{g}/\text{m}^3$ in samples collected in first and second floors of the building and below current Tier 1 ESL. TPH-g, naphthalene, and methane results were all non-detect above laboratory reporting limits. Detections of ethylbenzene, toluene and xylenes were all below their respective Tier 1 ESL. Analytical results are tabulated in **Table 2** and presented in **Figure 4**.

Ambient Air - TPH-d and TPH-g were detected in all collected ambient air samples with benzene and naphthalene detected only in sample BR11-1AA01 (closest to 127B). The highest reported concentrations of sampled locations were $1.1 \mu\text{g}/\text{m}^3$ for benzene, $340 \mu\text{g}/\text{m}^3$ for TPH-d, and $4,800 \mu\text{g}/\text{m}^3$ for TPH-g. Reported ambient air concentrations were higher than indoor air concentrations for samples collected concurrently from Building Unit 127B. Analytical results are tabulated in **Table 3** and presented in **Figure 5**.

5.4 Analytical Results Discussion

For discussion purposes, the results of the sub-slab venting sample were used to evaluate general sub-slab vapor conditions. The results of the first post-construction SVI investigation conducted in April 2019 confirm the following data analysis:

1. Sub-slab vapor concentrations for benzene beneath Building 127B was $11 \mu\text{g}/\text{m}^3$, which is above the Tier 1 ESL and similar to sub-slab benzene concentrations reported in adjacent Building 127A. The slight elevation in COC concentrations in the sub-slab zone is expected due to the installation of the vapor barrier and corresponding buildup of COC vapors below the barrier, which are effectively being captured by the VMS.
2. Sub-slab vapor concentrations for TPH-d slightly exceed current Tier 1 ESLs, which is expected due to the installation of the vapor barrier and a corresponding buildup of COC vapors below the barrier. These results indicate sub-slab vapor impacts are effectively being captured by the VMS.
3. Reported benzene concentrations in Building 127B are within documented typical background indoor air concentrations for residences that are not known

to be impacted by soil vapor intrusion and similar to those reported in 127A, 128A, and 129B.

- a. Reported benzene indoor air concentrations from 0.21 (to 0.31 $\mu\text{g}/\text{m}^3$) are within typical, 50th percentile, background indoor air concentrations of 0.05 to 4.7 $\mu\text{g}/\text{m}^3$ (EPA/OSWER, 2011; MDEQ, 2012; MDEPBRWM, 2012).
 - b. Indoor air contains ubiquitous volatile chemicals (including benzene) from consumer products, building materials, and ambient air (EPA, 2011).
4. TPH-g in indoor air was non-detect and TPH-d detected at concentrations below current Tier 1 ESLs; this is similar in concentrations reported in 127A, 128A, and 129B, and below reported ambient air concentrations.
 5. Benzene, TPH-d, and TPH-g in ambient air were consistently detected at concentrations significantly greater than concentrations in indoor air.

The results presented above indicate that ambient air is most likely the primary source of benzene and TPH-d concentrations detected in indoor air in unit 127B. This conclusion is based on the fact that the COC concentrations from sampling indoor air are much lower than the concentrations for the same constituents in the surrounding ambient air.

Based on this initial post-construction SVI investigation, the VMS (sub-slab venting and vapor intrusion membrane) and new concrete slab are providing effective mitigation of impacted sub-slab vapors and the SVI risk to residential occupants has been eliminated.

In addition, the Trust anticipates managing the residual sub-slab vapor impacts and potential soil vapor intrusion by establishing LUCs at Building 127B and 127A and implementing associated administrative procedures.

6.0 POST-CONSTRUCTION VMS OPERATION AND MAINTENANCE, REPORTING, AND SCHEDULE

The operation and maintenance (O&M) of the passive sub-slab venting system and vapor barrier will consist of minimum yearly visual inspections of the condition of the above ground venting piping and condition of the basement concrete slab. An OMMP for the installed VMS system is under preparation and will be submitted to RWQCB under separate cover.

As proposed in the *Revised VMS Design*, a second post-construction SVI sampling at 127B will be conducted in October 2019 approximately six months after the initial sampling. The second post-construction SVI will serve to establish that the installed mitigation system is effectively attenuating vapor intrusion. The second SVI sampling will include the same indoor and ambient air sampling locations as the completed April 2019 event and the same analytical suite. In addition to the indoor and ambient samples, a sample will be collected from the vent riser of the SSVS system as well.

Additional indoor air monitoring after the second post-construction sampling will be implemented during inter-occupancy periods and after slab penetration/improvements. Indoor air inter-occupancy sampling will be conducted following the same protocols as the post-construction confirmation sampling. In the event the inter-occupancy results indicates a statistically significant increase in indoor air concentrations, the Trust will immediately notify the RWQCB and implement response actions to address the risk.

Results of annual inspections, conducted inter-occupancy sampling, and related data evaluation will be presented in the annual LUC inspection and maintenance report, which is included in the Annual O&M Report. The first VMS system inspection will be conducted during the second SVI sampling event.

The results of the second post-construction SVI confirmation sampling will be submitted to the RWQCB as a separate report. Based on the results, the Trust may request RWQCB's final concurrence that no unacceptable human health risk from vapor intrusion is present which will allow the Trust to proceed with the rental of the unit.

A preliminary schedule for the implementation of the mitigation action and post-construction confirmation sampling is as follows:

Activity/Milestone	Date
First Post-Construction Confirmation Sampling	April 2019 (Complete)
127B Construction Completion Report (CCR) and First Post-Construction Sampling Report and Preliminary Concurrence Request for 127B	August 2019
RWQCB Approval of CCR	September 2019
Second Post-Construction SVI Confirmation Sampling	October 2019
Soil Vapor Intrusion Concurrence Request for 127B	November 2019 (based on results of October 2019 post-construction confirmation sampling)
Implementation of Annual Inspections and inter-occupancy sampling	Fourth Quarter 2019 and yearly thereafter and between periods of occupancy

The presented schedule is based on timely regulatory approval of submitted documents and is subject to change due to circumstances outside the control of the Trust such as force majeure, subcontractor, equipment, and materials availability. The Trust will provide updates to the RWQCB as necessary to communicate project progress and expected delays or changes to the proposed schedule.

7.0 CONCLUSION

The construction of the VMS at Building 127B was successfully completed in March 2019 in accordance to the approved *Revised VMS Design* with no significant deviations to the design. Operation of the VMS system began March 15, 2019, when installation of the above ground piping was completed with first post-construction sampling conducted in April 2019.

The results of the April 2019 SVI investigation event indicate the source of benzene and TPH-d reported in unit 127B indoor air is most likely due to ambient air intrusion and/or typical of background concentrations for indoor air and not a result of impacted soil vapor intrusion. The reported sub-slab COC concentrations are expected due to the buildup of COC vapors under the recently-installed vapor barrier. The elevated sub-slab COC concentrations in the collected vent sample coupled with the low COC levels in indoor sampling indicate that the VMS has created an effective envelope of containment (which is the intent of the system) and that the SVI risk to residential occupants is being mitigated.

With the submittal of this CCR and first post-confirmation sampling results, the Trust request RWQCB concurrence of the following:

1. The required vapor intrusion mitigation system has been completed consistent with the approved *Revised VMS Design*, and is approved by RWQCB, and
2. There is currently no unacceptable human health risk from soil vapor intrusion in Building 127B.

As stated in *Revised VMS Design*, a second post-construction SVI sampling will be conducted at 127B and the results used to confirm and request a final RWQCB concurrence that no unacceptable human health risk from soil vapor intrusion is present in Building 127B.

8.0 REFERENCES

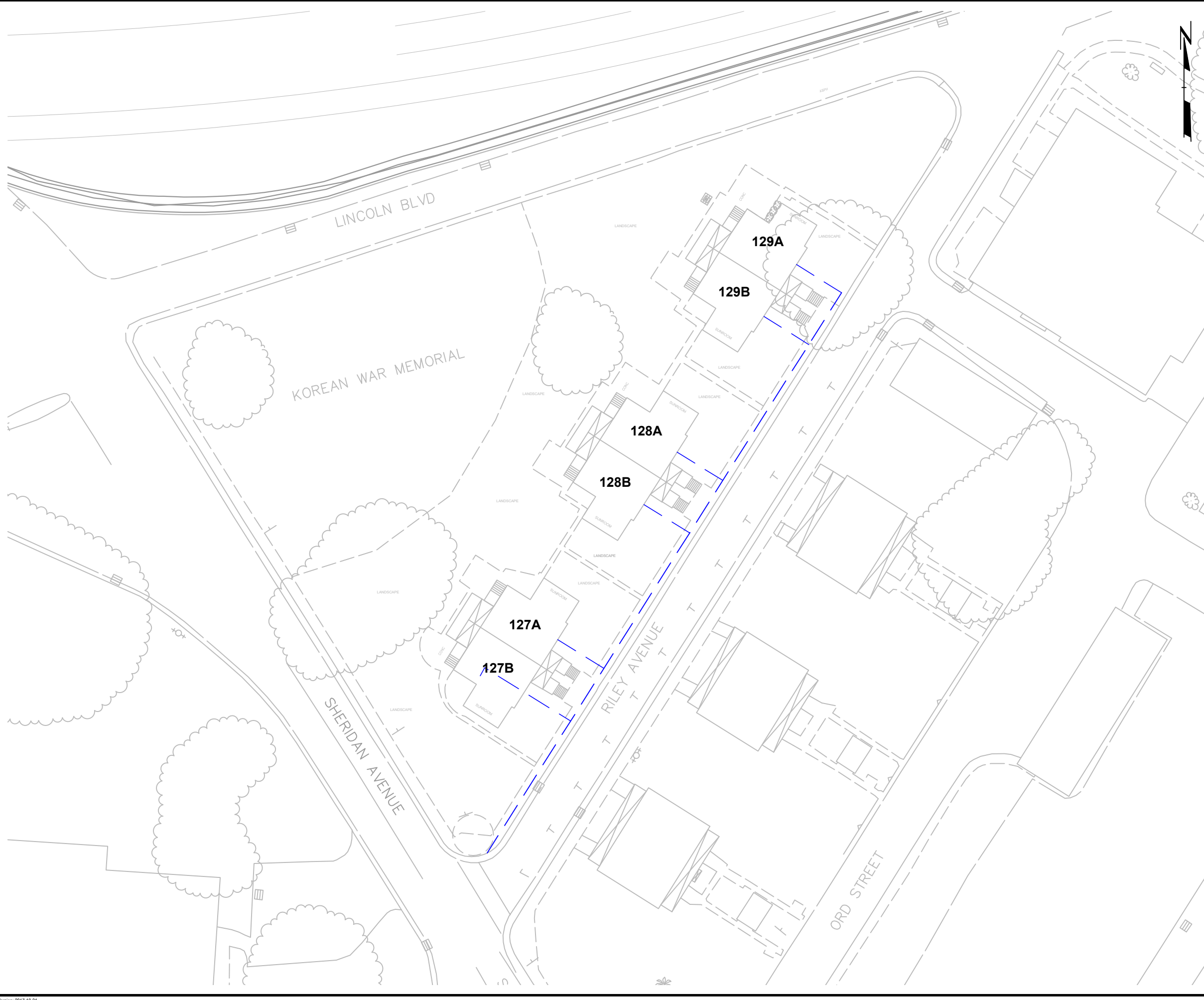
- RWQCB. 2009. *No Further Action, Fuel Distribution System, FDS Closure Certification Report Phase I, Presidio of San Francisco, San Francisco County, Water Board Case No. 38D9327*. September 16.
- RWQCB. 2017a. *Presidio Trust – Re-Opening of Closed Case, FDS Section BR 11-1*. Email message to Nina Larssen. July 20.
- RWQCB, 2018a. *Presidio Trust Request for Final Concurrence – No Unacceptable Soil Vapor Intrusion Risk and No Further Action Determination, Buildings 128B and 129A Riley Avenue, Presidio of San Francisco*. June 22.

-
- RWQCB, 2018b. *Presidio Trust Request for Final Concurrence – No Unacceptable Soil Vapor Intrusion Risk and No Further Action Determination, Buildings 128A and 129B Riley Avenue, Presidio of San Francisco*. August 16.
- RWQCB, 2018c. *Water Board Concurrence with No Unacceptable Soil Vapor Intrusion Risk, Building Unit 127A Riley Avenue, Fuel Distribution System Section BR11-1, Presidio of San Francisco, California*. October 24.
- RWQCB. 2019a. *Environmental Screening Levels*. January 2019 (Rev. 2).
http://www.waterboards.ca.gov/rwqcb2/water_issues/programs/esl.shtml
- RWQCB, 2019b. *Regional Water Quality Control Board Review of Revised Mitigation Design – Vapor Mitigation System, Building Unit 127B Riley Avenue, Fuel Distribution System Section BR11-1, dated March 2, 2019, Presidio of San Francisco*. March 8.
- IT Corporation. 1999. *Fuel Distribution System Closure Report, Presidio of San Francisco, California*.
- Maine Department of Environmental Protection Bureau of Remediation & Waste Management (MDEPBRWM). 2012. *Typical Concentrations of Petroleum Compounds in Maine Residential Indoor Air*. April (Revised January 2014).
- Montana Department of Environmental Quality (MDEQ). 2012. *Typical Indoor Air Concentrations of Volatile Organic Compounds in Non-Smoking Montana Residences Not Impacted by Vapor Intrusion*. August.
- The Presidio Trust (Trust). 2006. *Fuel Distribution System, Draft FDS Closure Certification Report – Phase 1, Presidio of San Francisco, California, REQUEST FOR CLOSURE CERTIFICATION*. January 27.
- TRC Solutions, Inc. (TRC). 2017a. *DRAFT Section BR11-1 Investigation Work Plan Fuel Distribution System, Riley Avenue, Presidio Trust of San Francisco, San Francisco, California*. September 14.
- TRC. 2017b. *Interim Update, Results of Site Investigation - BR11-1 Fuel Distribution System, Riley Avenue, Presidio Trust of San Francisco, San Francisco, California*. October 30.
- TRC. 2017c. *Addendum 1, Section BR11-1 Vapor Intrusion Assessment Work Plan and Interim Mitigation Plan, Fuel Distribution System, Riley Avenue, Presidio Trust of San Francisco, San Francisco, California*. December 20.
- TRC. 2018a. *Addendum to Vapor Intrusion Assessment Work Plan and Interim Mitigation Plan (VI Work Plan) in Response to RWQCB Comments, Section BR11-1 Fuel Distribution System, Riley Avenue, Presidio of San Francisco, San Francisco, California*. January 19.


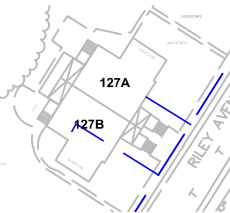

-
- TRC. 2018b. *Addendum 2, Section BR11-1 Supplemental Site Investigation Work Plan, Fuel Distribution System, Riley Avenue, Presidio of San Francisco, San Francisco, California.* March 8.
- TRC. 2018c. *Request for Final Concurrence – No Soil Vapor Intrusion Risk and No Further Action Determination, Buildings 128B and 129A Riley Avenue, Fuel Distribution System Section BR11-1, Presidio of San Francisco, San Francisco, California.* June 7.
- TRC. 2018d. *Request for Final Concurrence – No Soil Vapor Intrusion Risk and No Further Action Determination, Buildings 128A and 129B Riley Avenue, Fuel Distribution System Section BR11-1, Presidio of San Francisco, San Francisco, California.* August 3.
- TRC. 2018e. *Request for Final Concurrence – No Soil Vapor Intrusion Risk and No Further Action Determination, Building 127A Riley Avenue, Fuel Distribution System Section BR11-1, Presidio of San Francisco, San Francisco, California.* August 24.
- TRC. 2018f. *Remedial Design, Vapor Mitigation System, Building 127B Riley Avenue, Section BR11-1, Fuel Distribution System, Riley Avenue, Presidio of San Francisco, San Francisco, California.* October 18.
- TRC. 2019a. *Revised Vapor Mitigation System Design, Building 127B Riley Avenue, Section BR11-1, Fuel Distribution System, Riley Avenue, Presidio of San Francisco, San Francisco, California.* March 5.
- TRC. 2019b. *Revised Section BR11-1 Supplemental Site Investigation Report, Fuel Distribution System, Riley Avenue, Presidio of San Francisco, San Francisco, California.* August 2.
- U.S. Environmental Protection Agency Office of Solid Waste and Emergency Response (EPA/OSWER). 2011. *Background Indoor Air Concentrations of Volatile Organic Compounds in North American Residences (1990-2005): A Compilation of Statistics for Assessing Vapor Intrusion.* June.

FIGURES

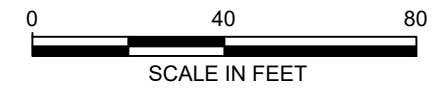
1x17 - USER: kquamell - ATTACHED: REFS - MASTER: Presidio Planimetrics, New Dots Alignment - ATTACHED IMAGES:
 DRAWING NAME: N:\Shared\CAD_DRAWING\Current\Presidio - Riley Ave Supplemental Site Investigation_July 19\Fig2 Site Map_REV JULY19.dwg --- PLOT DATE: July 16, 2019 - 8:34AM --- LAYOUT: 11X17L
 Version: 2017-10-21




LEGEND

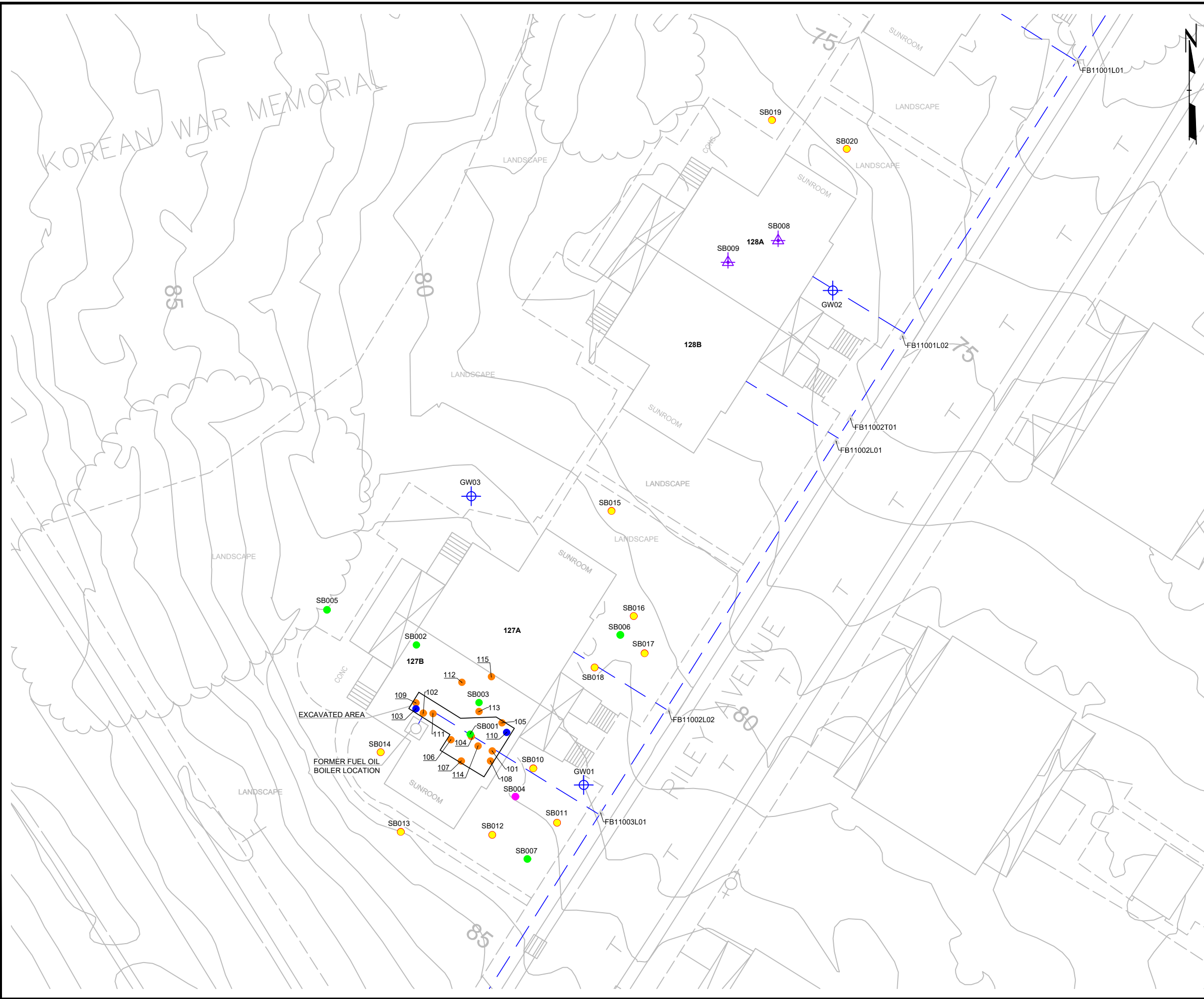
-  FORMER BR11-1 FDS LINE
-  RESIDENTIAL UNITS
-  LOCATION OF HISTORIC UNDERGROUND FUEL TANK PSF-127 (REMOVED 1978 - WES, 1990; MW, 1992)

- NOTES**
1. REFERENCES
 - 1.1. US ARMY ENGINEERS WATERWAYS EXPERIMENT STATION (WES), 1990. PHASE II PRELIMINARY ASSESSMENT UST DATA SHEETS, UST LOCATIONS AND STATUS ASSESSMENT UST/FDS 162. MARCH 1990.
 - 1.2. MONTGOMERY WATSON (MW), 1992. UST MANAGEMENT PLAN.



PROJECT: THE PRESIDIO TRUST BR11-1 FUEL DISTRIBUTION SYSTEM RILEY AVENUE, SAN FRANCISCO, CALIFORNIA	
TITLE: SITE MAP	
DRAWN BY: K. LI CHECKED BY: A. ANG APPROVED BY: A. ANG DATE: JULY 2019	PROJ NO.: 285830.04A.02 FIGURE 1
	
505 Sansome Street Suite 1600 San Francisco, CA 94111 Phone: 415.434.2600	
FILE NO.: Fig2 Site Map_REV JULY19.dwg	

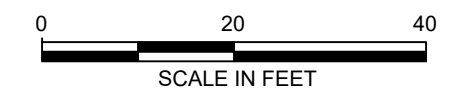
11x17 -- USER: D:\Parsons -- ATTACHED FILES: MASTER PRECISO BASEMAP, MASTER PRECISO PLANIMETRICS, New Dwyer Alignment -- ATTACHED IMAGES: DRAWING NAME: N:\PROJECTS\CAD\Presidio - Riley Ave\Remedial Design\Fig2 Site Plan.dwg -- PLOT DATE: April 25, 2019 - 2:19PM -- LAYOUT: Layout1-11x17L
 Version: 2017-10-21



LEGEND	
	FORMER BR11-1 FDS LINE
	JULY 2017 REMEDIAL EXCAVATION EXTENTS
	JUNE 2018 SOIL BORINGS
	OCT. 2017 SOIL SAMPLE LOCATIONS
	OCT. 2017 SOIL & GROUNDWATER SAMPLE LOCATION
	MAY - JULY 2017 SOIL SAMPLE LOCATIONS
	MAY - JULY 2017 SEEPWATER SAMPLE LOCATIONS
	APR. 1999 SOIL SAMPLE LOCATIONS
	GROUNDWATER MONITORING WELL
	SOIL VAPOR WELL

NOTES




- EXTERIOR WELL AND BORING LOCATIONS SURVEYED BY TOWILL IN JULY 2018. COORDINATE SYSTEM: CALIFORNIA STATE PLAN ZONE III NAD83 AND ELEVATION DATUM NAVD88.

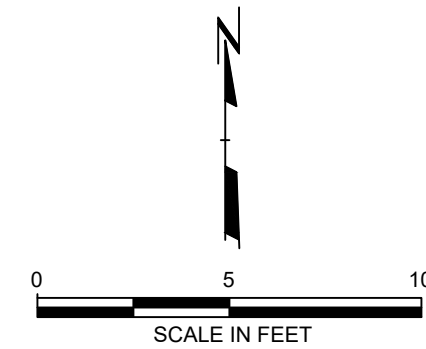
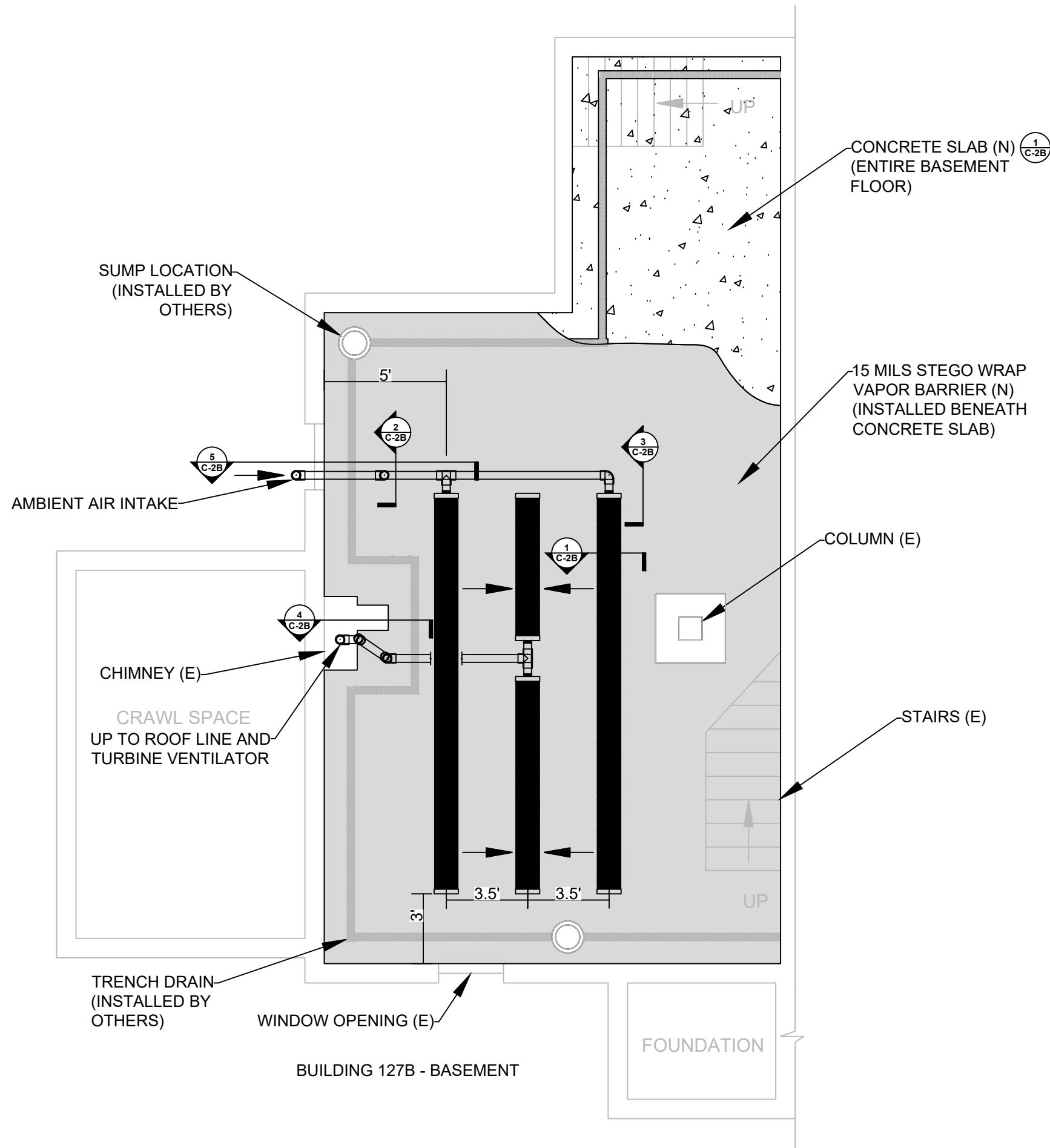



PROJECT:		THE PRESIDIO TRUST BR11-1 FUEL DISTRIBUTION SYSTEM RILEY AVENUE, SAN FRANCISCO, CALIFORNIA	
TITLE:		SITE PLAN	
DRAWN BY:	D. PARSONS	PROJ NO.:	285830.000002.TASK04
CHECKED BY:	A. ANG	FIGURE 2	
APPROVED BY:	A. ANG		
DATE:	APRIL 2019		
		505 Sansome Street Suite 1600 San Francisco, CA 94111 Phone: 415.434.2600	
FILE NO.:	Fig2 Site Plan.dwg		

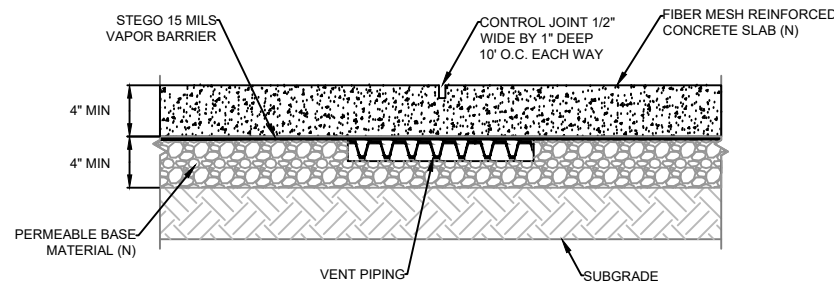
1x17 - USER: KLI - ATTACHED XREFS: SFAMP-ANG-RE-08-30-19 - ATTACHED IMAGES: DRAWING NAME: N:\PROJECTS\CAD\Presidio - Riley Ave\Remedial Design\Fig3A 127B Sub-Slab Venting System Plan.dwg -- PLOT DATE: May 16, 2019 - 5:29PM -- LAYOUT: 11X17L

LEGEND

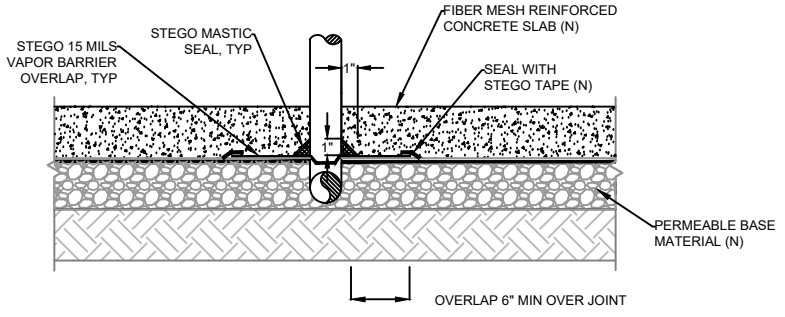
-  SUB-SLAB VAPOR VENT PIPING
-  STEGO SOIL VAPOR BARRIER
-  AIR FLOW



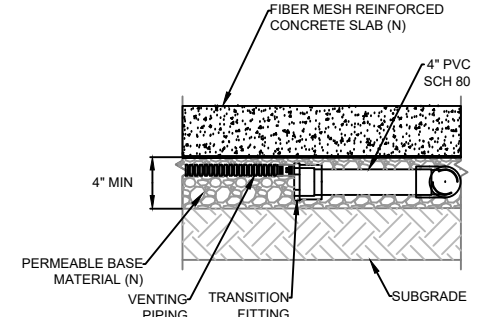
PROJECT:		THE PRESIDIO TRUST BR11-1 FUEL DISTRIBUTION SYSTEM RILEY AVENUE, SAN FRANCISCO, CALIFORNIA	
TITLE:		127B SUB-SLAB VENTING SYSTEM PLAN	
DRAWN BY:	K. LI	PROJ NO.:	285830.04A.02
CHECKED BY:	A. ANG	FIGURE 3A	
APPROVED BY:	A. ANG		
DATE:	MAY 2019		
		505 Sansome Street Suite 1600 San Francisco, CA 94111 Phone: 415.434.2600	
FILE NO.:		Fig3A 127B Sub-Slab Venting System Plan.dwg	



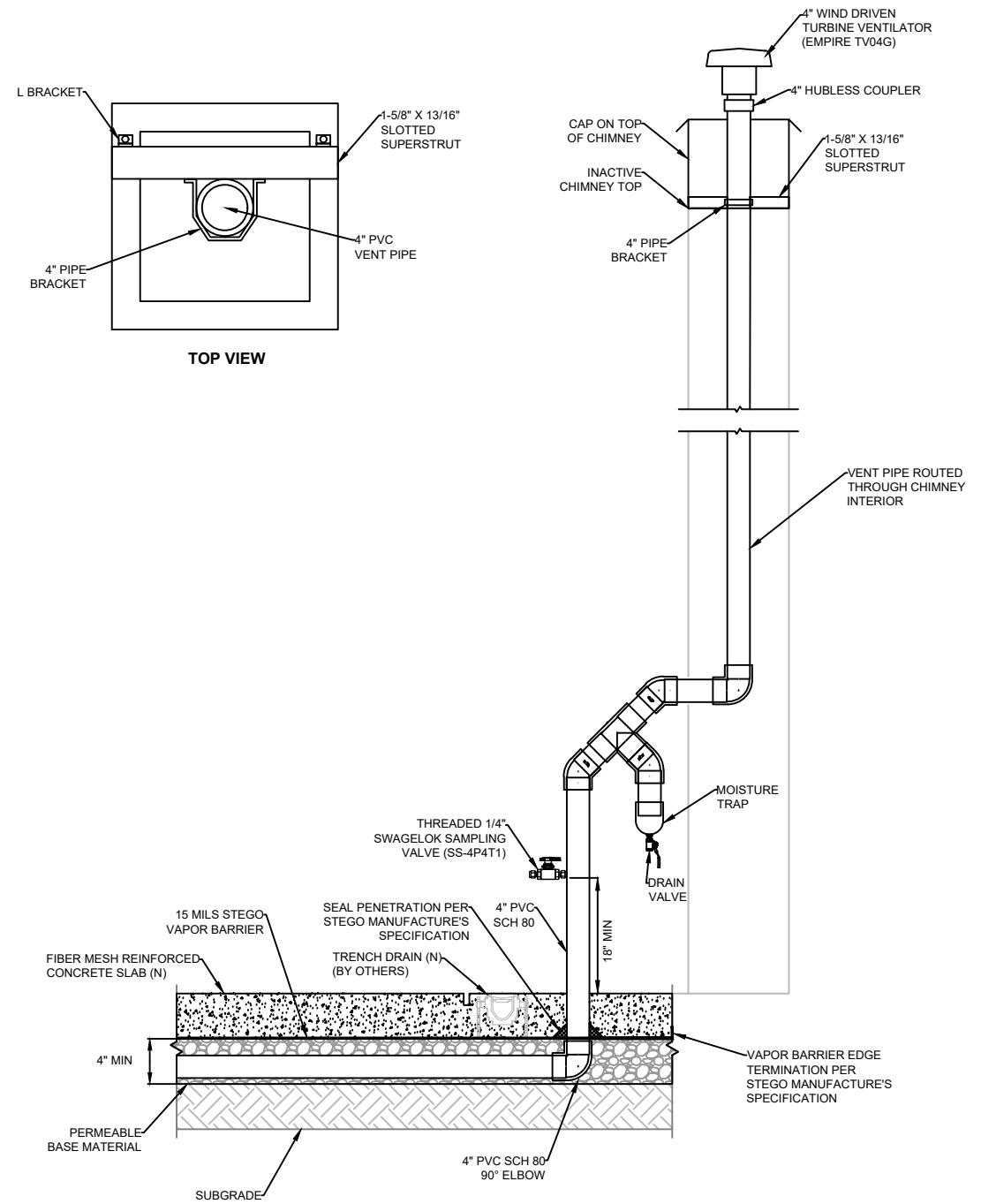
1
C-2A
TYPICAL VENT PIPE AND CONCRETE SLAB
(NOT TO SCALE)



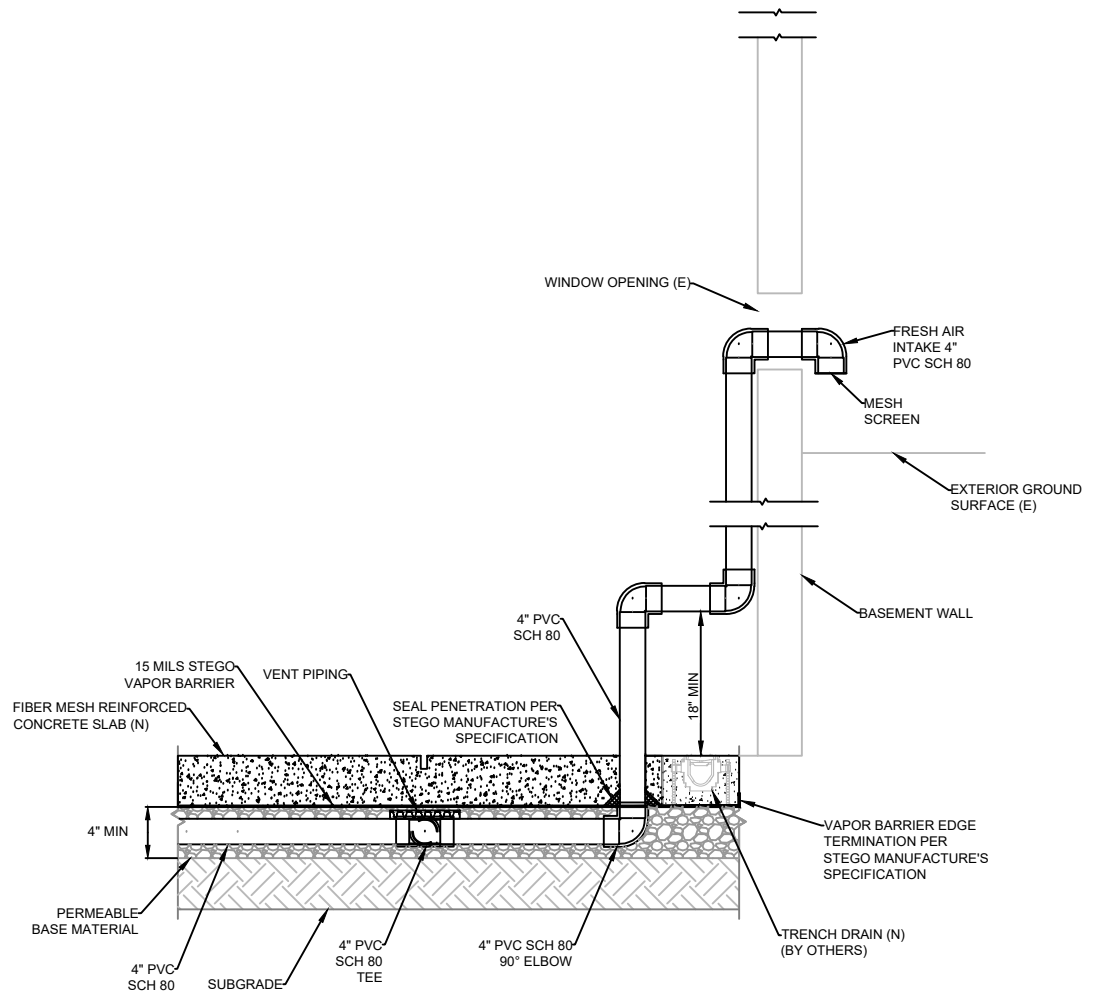
2
C-2A
TYPICAL VENT PIPE SLAB PENETRATION
(NOT TO SCALE)



3
C-2A
SUB-SLAB PIPING TRANSITION
(NOT TO SCALE)



4
C-2A
VENT PIPING
(NOT TO SCALE)

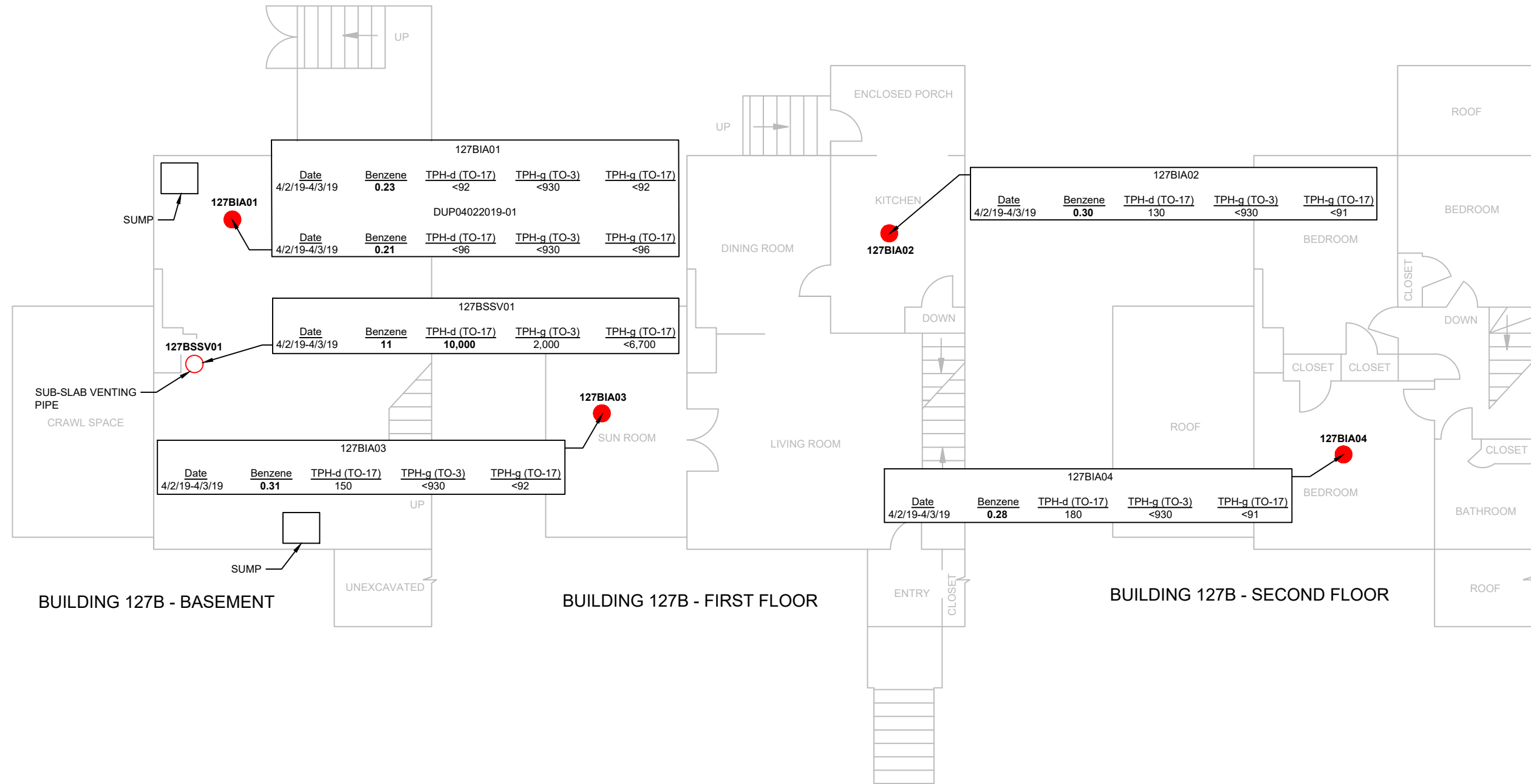


5
C-2A
AIR INTAKE PIPING
(NOT TO SCALE)

PROJECT:		THE PRESIDIO TRUST	
		BR11-1 FUEL DISTRIBUTION SYSTEM	
		RILEY AVENUE, SAN FRANCISCO, CALIFORNIA	
TITLE:			
127B SUB-SLAB VENTING SYSTEM DETAILS			
DRAWN BY:	K. LI	PROJ NO.:	285830.04A.02
CHECKED BY:	A. ANG	FIGURE 3B	
APPROVED BY:	A. ANG		
DATE:	MAY 2019		
DRAWING NAME: N:\PROJECTS\CAD\Presidio - Riley Ave\Remedial Design\Fig3B 127B Sub-Slab Venting System Details.dwg		FILE NO.: Fig3B 127B Sub-Slab Venting System Details.dwg	

1x17 - USER: KLI - ATTACHED REFS: STAMP: ANG-RE-08-30-19 - ATTACHED IMAGES: DRAWING NAME: N:\PROJECTS\CAD\Presidio - Riley Ave\Remedial Design\Fig3B 127B Sub-Slab Venting System Details.dwg -- PLOT DATE: May 16, 2019 - 5:27PM -- LAYOUT: 11X17L
 Version: 2017-10-21

11x17 - USE: D:\projects - ATTACHED IMAGES - ATTACHED IMAGES - SAN FRANCISCO PROJECTS\CAD\Presidio - Riley Ave\Remedial Design\Fig4 Post-Construction 127B Indoor Air Sampling Locations 5.24.19.dwg -- PLOT DATE: May 24, 2019 - 3:33PM -- LAYOUT: Layout1-11x17L
 Version: 2017-10-21



BUILDING 127B - BASEMENT

BUILDING 127B - FIRST FLOOR

BUILDING 127B - SECOND FLOOR

LEGEND

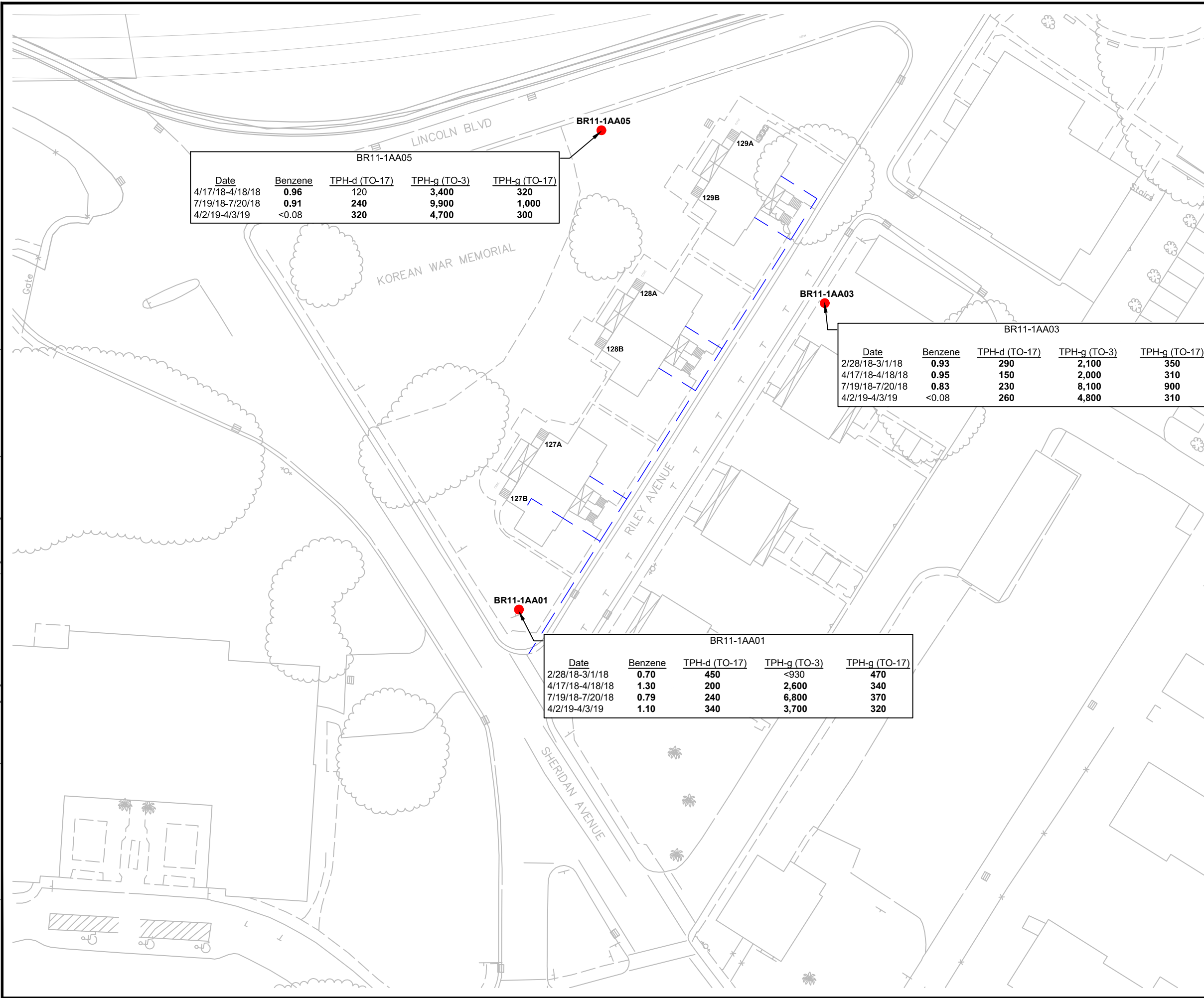
- 127BIA01 ● INDOOR AIR SAMPLING LOCATIONS
- 127BSSV01 SUB-SLAB VENTING SYSTEM SAMPLING LOCATION

NOTES

1. DRAWING NOT TO SCALE
2. ALL CONCENTRATIONS IN MICROGRAMS PER CUBIC METER ($\mu\text{g}/\text{m}^3$)
3. N/A - NOT ANALYZED
4. BOLD VALUES INDICATES THE CONCENTRATION EXCEEDS CURRENT ESL

PROJECT: THE PRESIDIO TRUST BR11-1 FUEL DISTRIBUTION SYSTEM RILEY AVENUE, SAN FRANCISCO, CALIFORNIA	
TITLE: POST-CONSTRUCTION 127B SUB-SLAB VENTING AND INDOOR AIR SAMPLING LOCATIONS	
DRAWN BY: D. PARSONS	PROJ NO.: 285830.000002.TASK04
CHECKED BY: A. ANG	FIGURE 4
APPROVED BY: A. ANG	
DATE: APRIL 2019	
505 Sansome Street Suite 1600 San Francisco, CA 94111 Phone: 415.434.2600	
FILE NO.: Fig4 Post-Construction 127B Indoor Air Sampling Locations 5.24.19.dwg	

11x17 - USER: D:\Parsons - ATTACHED IMAGES: MASTER: Presidio, Planimetrics, New Dwyer Alignment - ATTACHED IMAGES: DRAWING NAME: I:\SANFRAN\PROJECTS\CAD\Presidio - Riley Ave\Remedial Design\Fig5 Post-Construction Ambient Air Sampling Locations.dwg --- PLOT DATE: May 24, 2019 - 3:43PM --- LAYOUT: Layout1-11X17L
 Version: 2017-10-21



BR11-1AA05				
Date	Benzene	TPH-d (TO-17)	TPH-g (TO-3)	TPH-g (TO-17)
4/17/18-4/18/18	0.96	120	3,400	320
7/19/18-7/20/18	0.91	240	9,900	1,000
4/2/19-4/3/19	<0.08	320	4,700	300

BR11-1AA03				
Date	Benzene	TPH-d (TO-17)	TPH-g (TO-3)	TPH-g (TO-17)
2/28/18-3/1/18	0.93	290	2,100	350
4/17/18-4/18/18	0.95	150	2,000	310
7/19/18-7/20/18	0.83	230	8,100	900
4/2/19-4/3/19	<0.08	260	4,800	310

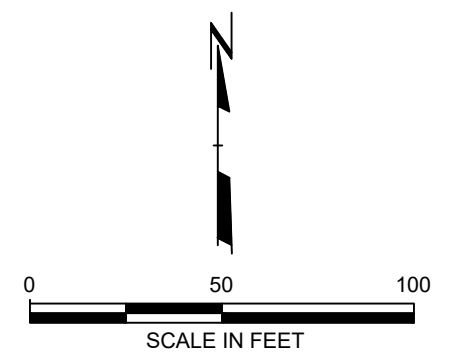
BR11-1AA01				
Date	Benzene	TPH-d (TO-17)	TPH-g (TO-3)	TPH-g (TO-17)
2/28/18-3/1/18	0.70	450	<930	470
4/17/18-4/18/18	1.30	200	2,600	340
7/19/18-7/20/18	0.79	240	6,800	370
4/2/19-4/3/19	1.10	340	3,700	320

LEGEND

--- BR11-1 FDS LINE

● BR11-1AA01 AMBIENT AIR SAMPLING LOCATIONS

- NOTES**
1. ALL CONCENTRATIONS IN MICROGRAMS PER CUBIC METER (ug/m³)
 2. BOLD VALUES INDICATES THE CONCENTRATION EXCEEDS CURRENT ESL



SOURCE: Base map by Towill, Oct.- Nov. 2015, Apr. 2016, May 2017, and Jan. 2018

PROJECT:		THE PRESIDIO TRUST BR11-1 FUEL DISTRIBUTION SYSTEM RILEY AVENUE, SAN FRANCISCO, CALIFORNIA	
TITLE:		AMBIENT AIR SAMPLING LOCATIONS	
DRAWN BY:	D. PARSONS	PROJ NO.:	285830.000002.TASK04
CHECKED BY:	A. ANG	FIGURE 5	
APPROVED BY:	A. ANG		
DATE:	APRIL 2019		
		505 Sansome Street Suite 1600 San Francisco, CA 94111 Phone: 415.434.2600	
		FILE NO.: Fig5 Post-Construction Ambient Air Sampling Locations.dwg	

TABLES

Table 1
Sub-Slab Vapor Analytical Results
Buildings 127A and 127B - Riley Avenue
Presidio of San Francisco, San Francisco, California

Residential Unit	Sample ID	Location	Date	Soil Vapor Constituents Method EPA TO-15						Soil Vapor Constituents Method EPA TO-03M LL	Indoor Air Constituents Method EPA TO-17	Soil Vapor Constituents Method EPA TO-17	Fixed Gases ASTM D-1946					
				Benzene	Ethylbenzene	Naphthalene	Toluene	p/m-Xylene	o-Xylene	TPH-Gasoline	TPH-Gasoline	TPH-Diesel	Methane ^b	Nitrogen	Carbon Dioxide	Carbon Monoxide	Oxygen	Helium
				Soil Vapor ($\mu\text{g}/\text{m}^3$)						Soil Vapor (%volume)								
127A	127ASSP01	Sub-slab	10/5/2017	21	37	<130	47	<43	81	N/A	N/A	39,000	1.51	88.7	3.85	<0.5	5.91	<0.01
	127ASSP01		2/27/2018	<8.0	<11	<4.2	<9.4	<43	<11	39,000	N/A	7,500	1.81	87.5	7.89	<0.5	2.79	<0.01
	DUP02272018-01		2/27/2018	<8.0	<11	<4.2	<9.4	<43	<11	40,000	N/A	25,000	2.01	87.6	8.07	<0.5	2.34	<0.01
	127ASSP01		7/18/2018	5.2	13	<6.1	7.6	21 J	22	120,000	N/A	30,000	1.07	86.2	7.58	<0.5	5.12	<0.0790
	DUP07182018-01		7/18/2018	5.6	12	<5.7	9.9	18 J	21	190,000	N/A	25,000	1.09	86.3	7.67	<0.5	4.94	<0.0678
	127ASSP02	Sub-slab	10/5/2017	<1.7	<2.3	<28	7.7	<9.2	<2.3	N/A	N/A	<5000	<0.5	79.3	7.51	<0.5	13.2	<0.01
	127ASSP02		2/27/2018	<1.7	<2.3	<0.88	<2.0	<9.0	<2.3	<930	N/A	<5000	<0.5	82.3	3.54	<0.5	14.1	0.016
127ASSP02	7/18/2018	<2.2	<2.6	<5.9	<2.6	<24	<12	1,000	N/A	<5000	<0.5	79.8	6.64	<0.5	13.5	0.0331		
127B	127BSSV01	Vent Riser	4/2/2019	11	5.1	<26	27	38	16	2,000	<6,700	10,000	<0.5	78.6	<0.5	<0.5	21.4	N/A
RWQCB ESLs (Tier 1, January 2019) ^a				3.2	37	2.8	10,000	3,500	3,500	3,300	3,300	8,900	1.25	--	--	--	--	--
RWQCB Residential ESLs (Soil Gas, January 2019) ^a				3.2	37	2.8	10,000	3,500	3,500	20,000	20,000	8,900	1.25	--	--	--	--	--

Notes:

Bold values indicates reported detected concentration exceeds the current ESL (2019, Rev 01) or established screening level.
 J = Analyte was detected at a concentration below the reporting limit and above the laboratory detection limit. Reported value is estimated.
 N/A = Not Analyzed

Abbreviations:

%v = percent volume	LL = Low Level
-- = not available	N/A = not analyzed
<# = not detected above the laboratory limit provided	RWQCB = Regional Water Quality Control Board
$\mu\text{g}/\text{m}^3$ = micrograms per cubic meter	TPH = Total Petroleum Hydrocarbons
AF = attenuation factor	TO = toxic organic
ASTM = American Society for Testing and Materials	
ID = identification	
ESLs = Environmental Screening Levels	

Footnotes:

^a RWQCB ESLs are from RWQCB's January 2019 (Rev. 02) Summary Table of Vapor ESLs (http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/esl.shtml).
^b Methane screening level from *Revised Vapor Mitigation System Design, Building 127B Riley Avenue*, TRC 2019

Table 2
Indoor Air Analytical Results
Building 127B - Riley Avenue
Presidio of San Francisco, San Francisco, California

Residential Unit	Sample ID	Location	Dates ^a	Indoor Air Constituents Method EPA TO-15 SIM						Indoor Air Constituents Method EPA TO-03M LL	Indoor Air Constituents Method EPA TO-17	Indoor Air Constituents Method EPA TO-17	Fixed Gases ASTM D-1946				
				Benzene	Ethylbenzene	Naphthalene	Toluene	p/m-Xylene	o-Xylene	TPH-Gasoline	TPH-Gasoline	TPH-Diesel	Methane ^c	Nitrogen	Carbon Dioxide	Carbon Monoxide	Oxygen
				Indoor Air (µg/m ³)						Indoor Air (%volume)							
127A	127AIA01	Basement	2/28/2018 - 3/1/2018	0.27	<0.11	0.055	0.21	0.11	<0.11	<930	<91	<91	<0.5	78.6	<0.5	<0.5	21.4
	DUP02282018-01		2/28/2018	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<100	110	N/A	21.5	N/A	N/A	N/A
	127AIA01		7/19/18 - 7/20/18	0.082	<0.11	<0.17	0.22	0.14	<0.11	1,200	<95	<95	<0.5	78.5	<0.5	<0.5	21.5
	DUP07192018-1	Kitchen	7/19/18 - 7/20/18	0.072 J	<0.11	<0.17	0.29	<0.22	<0.11	940	<100	<100	<0.5	78.5	<0.5	<0.5	21.5
	127AIA02		2/28/2018 - 3/1/2018	0.33	<0.11	<0.052	0.33	0.13	<0.11	<930	<100	110	<0.5	78.6	<0.5	<0.5	21.4
	127AIA02		7/19/2018	0.078 J	<0.11	<0.17	0.55	<0.22	<0.11	<930	<95	<95	<0.5	78.5	<0.5	<0.5	21.5
	127AIA03	Sunroom	2/28/2018 - 3/1/2018	0.45	0.13	0.053	0.54	0.69	0.30	<930	<83	99	<0.5	78.5	<0.5	<0.5	21.5
	DUP02282018-02		2/28/2018 - 3/1/2018	0.32	<0.11	<0.052	0.28	0.11	<0.11	<930	N/A	N/A	<0.5	78.5	<0.5	<0.5	21.5
	127AIA03	Bedroom	7/19/2018	0.088	0.17	<0.17	0.47	<0.22	<0.11	<930	120	<91	<0.5	78.6	<0.5	<0.5	21.4
	127AIA04		2/28/2018 - 3/1/2018	0.33	<0.11	<0.052	0.51	0.14	<0.11	<930	320	170	<0.5	78.5	<0.5	<0.5	21.5
127AIA04	7/19/2018		0.088	<0.11	<0.17	0.41	<0.22	<0.11	<930	150	88	<0.5	78.6	<0.5	<0.5	21.4	
127B	127BIA01	Basement	4/2/2019 - 4/3/2019	0.23	0.064	<0.17	0.41	0.18	0.079	<930	<92	<92	<0.5	78.6	<0.5	<0.5	21.4
	DUP04022019-01		4/2/2019 - 4/3/2019	0.21	0.071	<0.17	0.43	0.20	0.084	<930	<96	<96	<0.5	78.6	<0.5	<0.5	21.4
	FB04022019-1		4/2/2019	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<90	<90	N/A	N/A	N/A	N/A	N/A
	127BIA02	Kitchen	4/2/2019 - 4/3/2019	0.30	0.22	<0.17	1.1	0.89	0.46	<930	<91	130	<0.5	78.6	<0.5	<0.5	21.4
	127AIA03	Sunroom	4/2/2019 - 4/3/2019	0.31	0.17	<0.17	0.79	0.58	0.34	<930	<92	150	<0.5	78.6	<0.5	<0.5	21.4
	127AIA04	Bedroom	4/2/2019 - 4/3/2019	0.28	0.17	<0.17	0.78	0.61	0.35	<930	<91	180	<0.5	78.6	<0.5	<0.5	21.4
128A	128AIA01	Basement	2/28/2018 - 3/1/2018	0.87	0.15	0.069	2.5	0.35	0.13	<930	<91	<91	<0.5	79.1	<0.5	<0.5	20.9
	FB02282018-1		2/28/2018	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<77	<77	N/A	N/A	N/A	N/A	N/A
	128AIA01		7/19/18 - 7/20/18	0.057 J	<0.11	<0.17	0.098 J	<0.22	<0.11	<930	<91	91	<0.5	78.5	<0.5	<0.5	21.5
	128AIA02	Kitchen	2/28/2018 - 3/1/2018	0.29	<0.11	<0.052	0.41	0.28	0.13	<930	290	120	<0.5	78.5	<0.5	<0.5	21.5
	128AIA02		7/19/18 - 7/20/18	0.077 J	<0.11	<0.17	0.29	<0.22	0.061 J	<930	<95	<95	<0.5	78.6	<0.5	<0.5	21.4
	128AIA03	Sunroom	2/28/2018 - 3/1/2018	0.27	<0.11	<0.052	0.31	0.24	0.12	<930	190	99	<0.5	78.6	<0.5	<0.5	21.4
	128AIA03		7/19/18 - 7/20/18	0.064 J	<0.11	<0.17	0.30	<0.22	0.067 J	<930	<100	<100	<0.5	78.6	<0.5	<0.5	21.4
	128AIA04	Bedroom	2/28/2018 - 3/1/2018	0.30	<0.11	0.062	0.33	0.26	0.12	<930	91	<91	<0.5	78.6	<0.5	<0.5	21.4
128AIA04	7/19/18 - 7/20/18		0.074 J	<0.11	<0.17	0.35	<0.22	0.080 J	<930	<91	<91	<0.5	78.5	<0.5	<0.5	21.5	
129B	129BIA01	Basement	2/28/2018 - 3/1/2018	0.22	0.39	<0.052	0.22	1.5	0.52	<930	310	170	<0.5	78.6	<0.5	<0.5	21.4
	129BIA01		7/19/18 - 7/20/18	0.11	<0.11	<0.17	0.39	<0.22	0.057 J	<930	97	<91	<0.5	78.5	<0.5	<0.5	21.5
	129BIA02	Kitchen	2/28/2018 - 3/1/2018	0.35	0.34	<0.052	0.82	0.85	0.33	1,400	340	180	<0.5	78.6	<0.5	<0.5	21.4
	129BIA02		7/19/18 - 7/20/18	0.072 J	0.16	<0.17	0.82	0.13 J	0.12	<930	110	<100	<0.5	78.5	<0.5	<0.5	21.5
	129BIA03	Sunroom	2/28/2018 - 3/1/2018	0.25	0.32	<0.052	0.36	0.69	0.27	<930	<91	<91	<0.5	78.5	<0.5	<0.5	21.5
	129BIA03		7/19/18 - 7/20/18	0.090	0.30	<0.17	0.77	0.17 J	0.15	<930	130	100	<0.5	78.5	<0.5	<0.5	21.5
	129BIA04	Bedroom	2/28/2018 - 3/1/2018	0.38	0.37	<0.052	1.1	0.85	0.34	<930	140	170	<0.5	78.6	<0.5	<0.5	21.4
	129BIA04		7/19/18 - 7/20/18	0.089	0.38	<0.17	0.94	0.20 J	0.19	<930	120	110	<0.5	78.6	<0.5	<0.5	21.4
RWQCB ESLs (Tier 1, January 2019) ^b				0.097	1.1	0.083	310	100	100	100	100	270	0.75	--	--	--	--
RWQCB Residential ESLs (Indoor Air, January 2019) ^b				0.097	1.1	0.083	310	100	100	600	600	270	0.75	--	--	--	--

Table 2
Indoor Air Analytical Results
Building 127B - Riley Avenue
Presidio of San Francisco, San Francisco, California

Notes:
Bold values indicates the concentration exceeds the current ESL.
J = Analyte was detected at a concentration below the reporting limit and above the laboratory detection limit. Reported value is estimated.

Abbreviations:

%v = percent volume	ESLs = Environmental Screening Levels
-- = not available	LL = Low Level
<# = not detected above the laboratory limit provided	N/A = not analyzed
µg/m ³ = micrograms per cubic meter	RWQCB = Regional Water Quality Control Board
ASTM = American Society for Testing and Materials	SIM = selective ion monitoring
Ave. = Avenue	TPH = Total Petroleum Hydrocarbons
Blvd. = boulevard	TO = toxic organic
ID = identification	

Footnotes:
^a TO-15 and Fixed Gases samples collected over a 24 hour period and TO-17 samples over a 10 hour period.
^b RWQCB ESLs are from RWQCB's January 2019 (Rev. 02) Summary Table of Vapor ESLs (http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/esl.shtml).
^c Methane screening level from *Revised Vapor Mitigation System Design, Building 127B Riley Avenue*, TRC 2019

**Table 3
Ambient Air Analytical Results
Riley Avenue
Presidio of San Francisco, San Francisco, California**

Sample ID	Location	Dates ^a	Ambient Air Constituents Method EPA TO-15 SIM						Ambient Air Constituents Method EPA TO-03M LL	Ambient Air Constituents Method EPA TO-17	Ambient Air Constituents Method EPA TO-17	Fixed Gases ASTM D-1946				
			Benzene	Ethylbenzene	Naphthalene	Toluene	p/m-Xylene	o-Xylene	TPH-Gasoline	TPH-Gasoline	TPH-Diesel	Methane	Nitrogen	Carbon Dioxide	Carbon Monoxide	Oxygen
			Ambient Air (µg/m ³)						Outdoor Air (%volume)							
BR11-1AA01	South of 127B	2/28/2018 - 3/1/2018	0.70	1.2	0.086	7.1	5.0	1.8	<930	470	450	<0.500	78.6	<0.500	<0.500	21.4
		4/17/2018 - 4/18/2018	1.3	1.2	0.10	4.7	4.0	1.7	2,600	340	200	N/A	N/A	N/A	N/A	N/A
		7/19/18 - 7/20/18	0.79	3.4	0.30	13	6.6	5.6	6,800	370	240	<0.500	78.5	<0.500	<0.500	21.5
		4/2/2019 - 4/3/2019	1.1	1.7	0.65	6.0	5.7	2.4	3,700	320	340	<0.500	78.6	<0.500	<0.500	21.4
BR11-1AA02	Southeast of 128A	2/28/2018 - 3/1/2018	0.79	1.3	0.055	8.1	5.5	1.9	1,200	340	300	<0.500	78.6	<0.500	<0.500	21.4
		4/17/2018 - 4/18/2018	0.99	1.2	0.11	4.3	3.8	1.6	3,100	480	130	N/A	N/A	N/A	N/A	N/A
FB02282018-2		2/28/2018	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<77	<77	N/A	N/A	N/A	N/A	N/A
BR11-1AA03	Southeast of 129B	2/28/2018 - 3/1/2018	0.93	1.3	<0.052	8.0	6.1	2.1	2,100	350	290	<0.500	78.6	<0.500	<0.500	21.4
		4/17/2018 - 4/18/2018	0.95	1.0	0.075	3.8	3.3	1.4	2,000	310	150	N/A	N/A	N/A	N/A	N/A
		7/19/18 - 7/20/18	0.83	3.5	0.31	14.0	6.6	5.6	8,100	900	230	<0.500	78.5	<0.500	<0.500	21.5
		4/2/2019 - 4/3/2019	<0.080	<0.11	<0.26	<0.19	<0.22	<0.11	4,800	260	310	<0.500	78.6	<0.500	<0.500	21.4
FB04022019-2		4/2/2019	N/A	N/A	N/A	N/A	N/A	N/A	<90	<90	N/A	N/A	N/A	N/A	N/A	
BR11-1AA04	Front Yard 127B	4/17/2018 - 4/18/2018	1.2	1.3	0.12	4.9	4.3	1.8	3,300	370	170	N/A	N/A	N/A	N/A	N/A
BR11-1AA05	Northwest of 128A near Lincoln Blvd.	4/17/2018 - 4/18/2018	0.96	1.3	0.12	4.4	4.3	1.7	3,400	320	120	N/A	N/A	N/A	N/A	N/A
		7/19/18 - 7/20/18	0.91	3.1	<0.17	13	5.5	5	9,900	1,000	240	<0.500	78.5	<0.500	<0.500	21.5
		4/2/2019 - 4/3/2019	<0.080	<0.11	<0.26	<0.19	<0.22	<0.11	4,700	300	320	<0.500	78.5	<0.500	<0.500	21.5
BR11-1AA06	Northeast of 129A corner of Lincoln Blvd. and Riley Ave.	4/17/2018 - 4/18/2018	0.95	1.2	0.098	4.1	3.8	1.6	3,100	280	150	N/A	N/A	N/A	N/A	N/A
BR11-1AA07	South of 127B corner of Infantry Terrace and Fisher Loop	4/17/2018 - 4/18/2018	0.92	1.2	<0.052	4.1	3.6	1.6	3,300	190	110	N/A	N/A	N/A	N/A	N/A
RWQCB ESLs (Tier 1, January 2019) ^b			0.097	1.1	0.083	310	100	100	100	100	270	--	--	--	--	--
RWQCB Residential ESLs (Indoor Air, January 2019) ^b			0.097	1.1	0.083	310	100	100	600	600	270	--	--	--	--	--

Notes:

Bold values indicates the concentration exceeds the shown current ESL.
Shading indicates that the non detected value is above the shown current ESL.

Abbreviations:

%v = percent volume
-- = not available
<# = not detected above the laboratory limit provided
µg/m³ = micrograms per cubic meter
ASTM = American Society for Testing and Materials
Ave. = Avenue
Blvd. = boulevard
ID = identification

ESLs = Environmental Screening Levels
LL = Low Level
N/A = not analyzed
RWQCB = Regional Water Quality Control Board
SIM - selective ion monitoring
TPH = Total Petroleum Hydrocarbons
TO = toxic organic

Footnotes:

^a TO-15 and Fixed Gases samples collected over a 24 hour period and TO-17 samples over a 10 hour period.
^b RWQCB ESLs are from RWQCB's January 2019 (Rev. 02) Summary Table of Vapor ESLs (http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/esl.shtml).

ATTACHMENT A
VMS RWQCB Approval



San Francisco Bay Regional Water Quality Control Board

March 8, 2019
Geotracker ID: T10000001505 (JDW)

Presidio Trust
Attn. Ms. Nina Larssen
Remediation Project Manager
67 Martinez Street, P.O. Box 29052
San Francisco, CA 94129
Via email: nlarssen@presidiotrust.gov

**Subject: Regional Water Board Review of Revised Mitigation Design – Vapor Mitigation System, Building Unit 127B Riley Avenue, Fuel Distribution System Section BR11-1, dated March 5, 2019
Presidio of San Francisco**

Dear Ms. Larssen:

I reviewed the subject document that presents the design of a passive vapor mitigation system (VMS) to mitigate soil vapor intrusion into Riley Avenue Unit 127B. A schedule is also presented for submissions of a Construction Completion Report, an Operation, Maintenance, and Monitoring Plan, and other future deliverables. I concur with the VMS design as proposed.

If you have any questions, please contact me at 510.622.2375 or jeff.white@waterboards.ca.gov.

Sincerely,

Jeff White
Water Resource Control Engineer
Groundwater Protection Division

bc:

Alfonso Ang, TRC, AAng@trcsolutions.com
Justin Hanzel-Durbin, TRC, JHanzel-Durbin@trcsolutions.com
Sally Schoemann, TRC, sschoemann@trcsolutions.com
Alec Naugle, Regional Water Board, alec.naugle@waterboards.ca.gov

DR. TERRY F. YOUNG, CHAIR | MICHAEL MONTGOMERY, EXECUTIVE OFFICER

1515 Clay St., Suite 1400, Oakland, CA 94612 | www.waterboards.ca.gov/sanfranciscobay



ATTACHMENT B
Trust "N2" Compliance Approvals



CATEGORICAL EXCLUSION

Issued by the Presidio Trust Compliance Division
Presidio Trust, 103 Montgomery Street San Francisco, 94129 p: (415) 561-5365

Project Number: CR 17-051 (19009)

Date: November 19, 2018

Project Title Building 127B Installation of Vapor Mitigation and
Drainage Systems (FDS Section BR11-1 Investigation
& Remediation)

Administrative Review

Project Manager: Nina Larssen

Title: Remediation Project
Manager

Department: Environmental

PROJECT CONDITIONS

Not Applicable

SUPPORTING INFORMATION

The following material is incorporated by reference as supporting documentation for this CE:

Correspondence, Ventilator Spec, Vapor Mitigation System Plan and Detail, Photos

CRITERIA for ISSUANCE of CATEGORICAL EXCLUSION

(See "Extraordinary Circumstances" at 36 CFR 1010.7(b))	Yes	No
1. Have significant adverse effects on public health or safety?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Have adverse effects on such unique geographic characteristics as historic or cultural resources, park, recreation, or refuge lands, sole or principal drinking water aquifers, wetlands, floodplains, or ecologically significant or critical areas?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3. Have highly controversial environmental effects?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Have highly uncertain and potentially significant environmental effects or involve unique or unknown environmental risks?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Establish a precedent for future action or represent a decision in principle about future actions with potentially significant environmental effects?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Be directly related to other actions with individually insignificant but cumulatively significant environmental effects?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7. Have adverse effects on properties listed or eligible for listing on the National Register of Historic Places?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
8. Have adverse effects on species listed or proposed to be listed on the List of Endangered or Threatened Species, or have adverse effects on designated Critical Habitat for these species?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
9. Require compliance with Executive Order 11988 (Floodplain Management), Executive Order 11990 (Protection of Wetlands), Executive Order 13007 (Indian Sacred Sites), or the Fish and Wildlife Coordination Act?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

10. Threaten to violate a Federal, State, local, or tribal law or requirement imposed for the protection of the environment?

CATEGORICAL EXCLUSION

Categorical Exclusion: 36 CFR 1010.7(a) | (29) |

Construction or rehabilitation in previously disturbed or developed areas required to meet health or safety regulations, or to meet requirements for making facilities accessible to the handicapped provided such construction or rehabilitation is implemented in a manner consistent with applicable Executive Orders;

DETERMINATION

I find that the action could not individually or cumulatively have a significant effect on the environment, and therefore is covered under a Categorical Exclusion. No extraordinary circumstances apply, and the category used to exclude the action from further NEPA review or public input is listed in the Presidio Trust's Regulations implementing the NEPA as indicated above.


CEO or Designee

11.19.18
Date

Historic Preservation Specialist

Date



PRESIDIO TRUST CERTIFICATE OF COMPLIANCE

*with the National Historic Preservation Act under the
Programmatic Agreement for Operations And Maintenance*

Date: November 19, 2018
 To: Nina Larssen , Remediation Project Manager
 From: Federal Preservation Officer
 Project: CR 17-051 (19009)
 Title: Building 127B Intallation of Vapor Mitigation and Drainage Systems (FDS Section BR11-1 Investigation & Remediation)

Description: An investigation of soil, groundwater, and vapor intrusion into units 127A, 128A/B and 129A/B (reviewed under CR 17-051) has confirmed that there may be a risk to human health from soil vapor intrusion into historic building 127B (1931, Duplex). This project will install a sub-slab vapor mitigation system and a drainage system (to prevent ongoing water intrusion) in the basement of the unit. Work will include demolition of the concrete slab, removal of contaminated soil, backfill with clean soil, placement of the ventilation system, vapor barrier and a new concrete slab and drainage system. Trench drains, sump pump, and ventilation piping will be installed at the gravel level. The vapor barrier will be applied above the gravel, and 4 inches of concrete will be layered above that. The ventilation system will use an existing opening for air intake and a new opening will be created in the fireplace to run the ventilation piping up through the chimney. A metal screen will be added to the top of the chimney and piping will run through the screen terminating with a ventilation fan at the top of the chimney. Once installation of the vapor mitigation system in 127B is complete, two rounds of vapor intrusion investigation will be performed. Land use controls will be implemented and the concrete slabs in 127A and 127B will be inspected annually to ensure the slabs are intact and the venting system in 127B is operating as intended.

The above mentioned undertaking has been found to have No Adverse Effect on historic properties in Area B of the Presidio of San Francisco. This conclusion is supported by the screening form and additional analysis contained in the project file. You may proceed with the project once you have met the NEPA compliance requirements, and based on conformance with the following stipulations:

- | | |
|--|-----------|
| | Completed |
| 1. This approval is limited to the submitted scope of work. Contact Historic Compliance Coordinator Megan Borthwick, mborthwick@presidiotrust.gov or 561-5062 if there are any changes to the project. | _____ |
| 2. The project manager is responsible for obtaining all applicable permits. Contact Permitting Manager Mike McGill (561-2785). | _____ |

It is the responsibility of the Project Manager to have all the stipulations completed, dated and initialed as stated above

Robert Thomson
Federal Preservation Officer

cc: Historic Compliance Coordinator

ATTACHMENT C
Vapor Mitigation System Materials and Equipment Specifications

SECTION 31 21 16.13

SUB-SLAB VENTING SYSTEM

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:

- 1. Substrate preparation.
- 2. AdvantEdge or Vapor-Vent™ HD installation.
- 3. AdvanEdge or Vapor-Vent HD accessories.

- B. Related Documents: The following Documents contain requirements that relate to this Section:

- 1. Corrective Action Plan and Remedial Design, Buildings 127A, 127B, and 128A Riley Avenue, Section BR11-1, Fuel Distribution System, Riley Avenue, Presidio of San Francisco, San Francisco, California
- 2. Presidio Trust Lendrum Court Final Technical Provisions – Section 22.01 Waste Management and Disposal

1.3 PERFORMANCE REQUIREMENTS

- A. General: The Contractor shall provide a sub-slab vapor venting system installed within a permeable material layer that collects gas vapors and directs them to a discharge or collection point (vent riser) as specified in the Drawings and that complies with the physical requirements set forth by the manufacturer. This specification covers installation of the sub-slab venting system up to the riser vent penetration terminated through building slab.

1.4 SUBMITTALS

- A. The Contractor shall submit Product Data for each component of the sub-slab venting system specified, including manufacturer's specifications.
- B. Sample – The Contractor shall submit representative samples of the following for approval:
 - 1. Gas venting piping, AdvantEdge or Vapor-Vent HD.
 - 2. AdvantEdge or Vapor-Vent HD accessories.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: The Contractor or installer shall be an experienced installer for the installation of sub-slab venting system.
- B. Manufacturer Qualification: The Contractor shall obtain all sub-slab venting system components
- C. Pre-installation Conference: The Contractor shall attend a pre-installation conference with Engineer, other trades influenced by sub-slab venting system installation and special inspector (if any) to assure proper site and installation conditions.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. The Contractor shall ensure all materials are delivered to project site as specified by manufacturer, are labeled with manufacturer’s name, product brand name and type, date of manufacture, shelf life, and directions for handling.
- B. The Contractor shall store materials as specified by the manufacturer in a clean, dry, protected location and within the temperature range required by manufacturer. The Contractor shall protect stored materials from direct sunlight.
- C. The Contractor shall repair or remove and replace material that is damaged.

PART 2 – PRODUCTS

2.1 PERMEABLE MATERIAL (SUBSTRATE)

- A. Permeable layer material shall be as follows:

Sieve Size	Percentage Passing Sieve
Gravel or Crushed Rock	
1 inch	90 – 100
¾ inch	30 - 100
½ inch	5 - 25
3/8 inch	0 - 6

2.2 SUB-SLAB GAS VENT MATERIALS

- A. AdvantEdge or Vapor-Vent HD– low profile, trenchless, flexible, sub slab vapor collection system manufactured by Advanance Drainage Systems (ADS), or Land Science Technologies.
- B. Vent materials physical properties

VENT PROPERTIES	TEST METHOD	ADVANTEDGE or VAPOR-VENT HD
Material		HDPE
Comprehensive Strength	ASTM D-1621	11,400 lbs / ft ²
In-plane flow (Hydraulic gradient-0.1)	ASTM D-4716	30 gpm / ft of width
Chemical Resistance		Excellent
FABRIC PROPERTIES	TEST METHOD	ADVANTEDGE OR VAPOR-VENT
Grab Tensile Strength	ASTM D-4632	110 lbs.
Puncture Strength	ASTM D-4833	30 lbs.
Mullen Burst Strength	ASTM D-3786	90 PSI
AOS	ASTM D-4751	50 U.S. Sieve
Flow Rate	ASTM D-4491	95 gpm / ft ²
UV Stability (500 hours)	ASTM D-4355	70% Retained
DIMENSIONAL DATA		
Thickness		1"
Standard Widths		12"
Roll Length		165 ft 68 lbs

- C. Riser pipe transition shall be schedule (SCH) 80, polyvinyl chloride (PVC) pipe meeting American Society for Testing and Materials (ASTM) D1785-12 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120

2.3 AUXILIARY MATERIALS

- A. Sub-slab venting system fittings including end outs, end caps, elbows and tees manufactures by ADS or Land Science Technologies.
- B. Reinforced Tape as recommended by manufactured for connection between sub-slab venting pipe and round PVC pipe.
- C. SCH 80, PVC fittings meeting ASTM D2467-13a - Standard Specification for Polyvinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 80.
- D. PVC primer and glue and meeting ASTM F656-1 - Standard Specification for Primers for Use in Solvent Cement Joints of Poly(Vinyl Chloride) (PVC) Plastic Pipe and Fittings and ASTM D2564-12 - Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems, respectively.
- E. Pipe Sleeves shall be SCH 40, galvanized steel pipes meeting ASTM A53, Type E, Grade A, with plain ends.
- F. Pipe Sleeve Sealant shall be aerosol polyurethane foam sealant meeting ASTM C1620-12 or approved equivalent.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. The Contractor shall examine substrates, areas, and conditions under which gas vent system will be installed, with installer present, for compliance with requirements. The Contractor shall not proceed with installation until unsatisfactory conditions have been corrected.

3.2 SUBSTRATE PREPARATION

- A. The Contractor shall verify substrate is prepared according to project requirements.

3.3 PREPARATION FOR VAPOR-VENT HD

- A. The Contractor shall mark the layout of sub-slab venting system piping as shown in Drawings.

3.4 SUB-SLAB VENTING PIPING INSTALLATION

- A. The Contractor shall install piping over substrate material where designated on drawings with the flat base of the core placed down and shall be overlapped in accordance with manufacturer's recommendations.
- B. At areas where piping strips intersect, the Contractor shall cut and fold back fabric to expose the dimpled core. The Contractor shall arrange the strips so that the top strip interconnects into the bottom strip. The Contractor shall unfold fabric to cover the core and use reinforcing tape, as approved by the manufacturer, to seal the connection to prevent sand or gravel from entering the core.

- C. When crossing piping strips over footings or grade beams, the Contractor shall coordinate with the structural engineer for appropriate use and placement of solid PVC pipe materials per the Drawings. The Contractor shall place solid pipe over or through the foundation concrete element (e.g., and attach a AdvantEdge or Vapor-Vent End Out at both ends of the pipe before connecting back the sub-slab venting system piping. The Contractor shall seal the sub-slab venting piping to the AdvantEdge or Vapor-Vent End Out fitting using reinforcement tape.
- D. The Contractor shall install sleeves for pipes passing through concrete foundation walls as follows:
 - 1. Cut sleeves to length for mounting flush with both surfaces.
 - 2. Build sleeves into new walls as work progresses.
 - 3. Install large enough sleeve to provide 1-inch annular space between sleeve and pipe.
- E. The Contractor shall place vent risers per the Drawings. The Contractor shall connect sub-slab venting piping to AdvantEdge or Vapor-Vent End Out and seal with reinforced tape. The Contractor shall use AdvantEdge or Vapor-Vent End Out with the specified diameter piping as shown in the Drawings.

3.5 PLACEMENT OF OVERLYING AND ADJACENT MATERIALS

- A. The Contractor shall place or install all overlying and adjacent permeable layer material using approved procedures and guidelines to prevent damage to the AdvantEdge or Vapor-Vent HD piping and related installations.
- B. Equipment shall not be directly driven over and stakes or any other materials may not be driven through the AdvantEdge or Vapor-Vent HD.

3.6 CONSTRUCTION WASTE MANAGEMENT

- A. General: The Contractor shall comply with the requirements of Section 22.01 Waste Management and Disposal of the Final Technical Specifications for the Presidio Trust Remediation Lendrum Court dated May 26, 2016, for removal and disposal of construction debris and waste.
- B. The Contractor shall separate and recycle waste materials to the maximum extent possible.

END OF SECTION

ADS ADVANEDGE® PIPE SPECIFICATION

Scope

This specification describes 12- and 18-inch (300 and 450 mm) ADS AdvanEDGE oblong corrugated pipe for use in subsurface drainage applications.

Product Requirements

ADS AdvanEDGE shall have annular interior and exterior corrugations.

- 12- and 18-inch (300 to 450 mm) shall meet ASTM D7001.

ADS AdvanEDGE outside dimensions shall be 1.5" thick by 12.5" wide or 1.5" thick by 18.5" wide. AdvanEDGE shall have internal bracing adjoining each long wall to prevent crushing under typical loading. AdvanEDGE shall be made available with or without an external geotextile wrap.

Material Properties

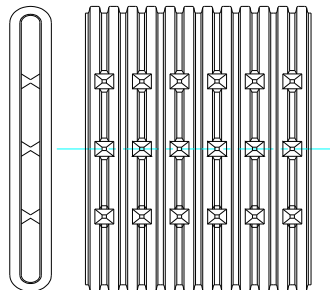
All pipe and fittings shall be made of polyethylene with a minimum cell classification of 424420C as defined and described in the latest version of ASTM D3350.

Perforations

Nominal Pipe Size, in (mm)	12 (300)	18 (450)
Slot Length (avg), in (mm)	1.125 (29)	1.125 (29)
Slot Width (avg), in (mm)	0.125 (3.2)	0.125 (3.2)
Water Inlet Area (approx.), in ² /ft	15	20

Filter Fabric

Fabric Properties	Test Method	Minimum Average Roll Values
Grab Tensile Strength (lbs.) (weakest principle direction)	ASTM D4632	120
Grab Elongation (%) (weakest principle direction)	ASTM D4632	60
Trapezoidal Tear (lbs.) (weakest principle direction)	ASTM D4533	40
Puncture (lbs.)	ASTMD4833	30
Permittivity (sec ⁻¹)	ASTM D4491	0.7
AOS (U.S. Sieve Size)	ASTM D4751	60
U.V. Resistance	ASTM D4355	70



UNDER-SLAB VAPOR BARRIER

PART 1 – GENERAL

1.1 SUMMARY

- A. Products supplied under this section:
 - 1. Vapor barrier and installation accessories for installation under concrete slabs.
- B. Related sections:
 - 1. Section 03 30 00 Cast-in-Place Concrete
 - 2. Section 07 26 00 Vapor Retarders

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM E1745- 11 Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
 - 2. ASTM E1643- 11 Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
- B. Technical Reference - American Concrete Institute (ACI):
 - 1. ACI 302.2R-06 Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.
 - 2. ACI 302.1R-15 Guide to Concrete Floor and Slab Construction.

1.3 SUBMITTALS

- A. Quality control/assurance:
 - 1. Summary of test results per paragraph 9.3 of ASTM E1745.
 - 2. Manufacturer's samples and literature.
 - 3. Manufacturer's installation instructions for placement, seaming, penetration prevention and repair, and perimeter seal per ASTM E1643.
 - 4. All mandatory ASTM E1745 testing must be performed on a single production roll per ASTM E1745 Section 8.1.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Vapor barrier shall have all of the following qualities:
 - 1. Maintain permeance of less than 0.01 Perms [grains/(ft² · hr · inHg)] as tested in accordance with mandatory conditioning tests per ASTM E1745 Section 7.1 (7.1.1-7.1.5).
 - 2. Other performance criteria:
 - a. Strength: ASTM E1745 Class A.
 - b. Thickness: 15 mils minimum
 - 3. Provide third party documentation that all testing was performed on a single production roll per ASTM E1745 Section 8.1
- B. Vapor barrier products:
 - 1. Basis of Design: Stego Wrap Vapor Barrier (15-mil) by Stego Industries LLC., (877) 464-7834 www.stegoindustries.com.
 - 2. No substitutions.

2.2 ACCESSORIES

- A. Seams:
 - 1. Stego Tape by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.

- B. Sealing Penetrations of Vapor barrier:
 1. Stego Mastic by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
 2. Stego Tape by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
- C. Perimeter/edge seal:
 1. Stego Crete Claw by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
 2. Stego Term Bar by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
 3. StegoTack Tape (double-sided sealant tape) by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
- D. Penetration Prevention:
 1. Beast Foot by Stego Industries LLC, (877) 464-7834 www.stegoindustries.com.
- E. Vapor Barrier-Safe Screed System
 1. Beast Screed by Stego Industries, LLC, (877) 464-7834 www.stegoindustries.com.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Ensure that subsoil is approved by Architect or Geotechnical Engineer.
 1. Level and compact base material.

3.2 INSTALLATION

- A. Install vapor barrier in accordance ASTM E1643.
 1. Unroll vapor barrier with the longest dimension parallel with the direction of the concrete placement and face laps away from the expected direction of the placement whenever possible.
 2. Extend vapor barrier to the perimeter of the slab. If practicable, terminate it at the top of the slab, otherwise (a) at a point acceptable to the structural engineer or (b) where obstructed by impediments, such as dowels, waterstops, or any other site condition requiring early termination of the vapor barrier. At the point of termination, seal vapor barrier to the foundation wall, grade beam or slab itself.
 - a. Seal vapor barrier to the entire slab perimeter using Stego Crete Claw, per manufacturer's instructions.
 - OR
 - b. Seal vapor barrier to the entire perimeter wall or footing/grade beam with double sided StegoTack Tape, or both Stego Term Bar and StegoTack Tape, per manufacturer's instructions. Ensure the concrete is clean and dry prior to adhering tape.
 3. Overlap joints 6 inches and seal with manufacturer's seam tape.
 4. Apply seam tape/Crete Claw to a clean and dry vapor barrier.
 5. Seal all penetrations (including pipes) per manufacturer's instructions.
 6. For interior forming applications, avoid the use of non-permanent stakes driven through vapor barrier. Use blunt-end and/or threaded nail stakes (screed pad posts) and insert them into Beast Foot. Ensure Beast Foot's peel-and-stick adhesive base is fully adhered to the vapor barrier
 7. If non-permanent stakes must be driven through vapor retarder, repair as recommended by vapor retarder manufacturer.
 8. Use reinforcing bar supports with base sections that eliminate or minimize the potential for puncture of the vapor barrier.
 9. Repair damaged areas with vapor barrier material of similar (or better) permeance, puncture and tensile.

10. For vapor barrier-safe concrete screeding applications, install Beast Screed (vapor barrier-safe screed system) per manufacturer's instructions prior to placing concrete.

END OF SECTION

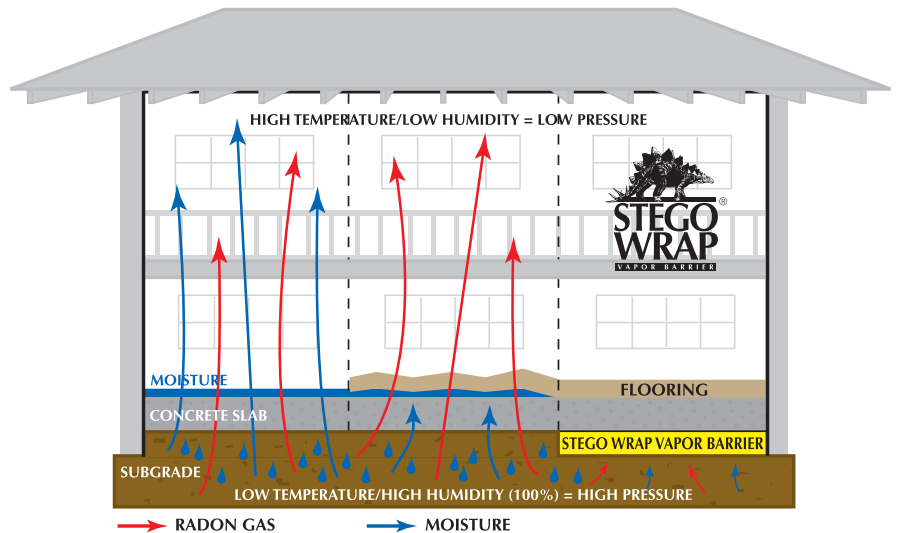


STEGO® WRAP VAPOR BARRIER

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.

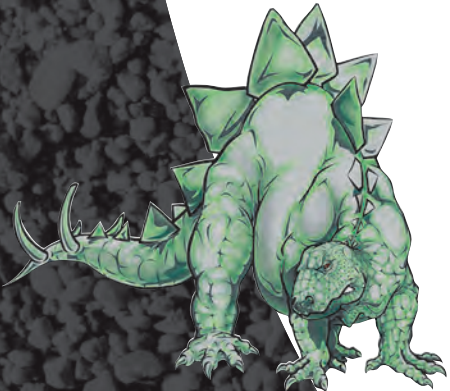
Infiltration of moisture through concrete slabs is a major building defect liability. Stego Wrap Vapor Barrier has an extremely low permeance preventing water vapor, soil gases (i.e. Radon), alkaline salts and soil sulfates from compromising the integrity of the building envelope and leading to serious 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 Stachybotrys 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).



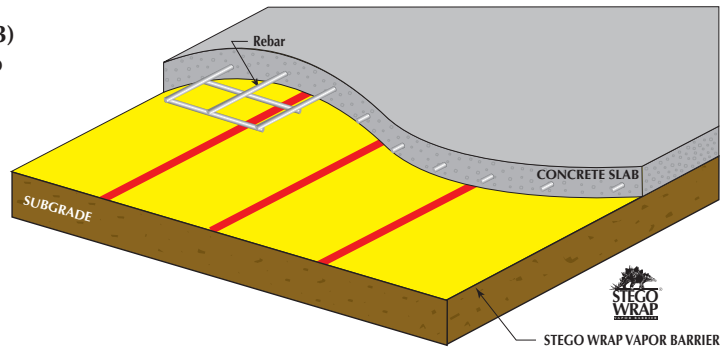
STEGO® WRAP VAPOR BARRIER SPECIFICATIONS

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/(ft² *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, the stegosaurus logo, Crete Claw, and StegoTack are all deemed to be registered and protectable trademarks of Stego Industries, LLC.



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 specifica-

tions 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)/m ² *day
Radon Diffusion Coefficient		5.5 x 10 ⁻¹⁴ m ² /second
Thickness	ACI 302.1R-04 - Minimum Thickness (10 mils)	15 mils
Roll Dimensions		14 ft. wide x 140 ft. long or 1,960 ft ²
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 bituminous/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 Thermoplastic 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 penetration. 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 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 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



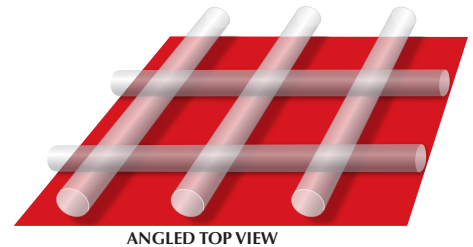
STEGO CRETE CLAW® TAPE

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.

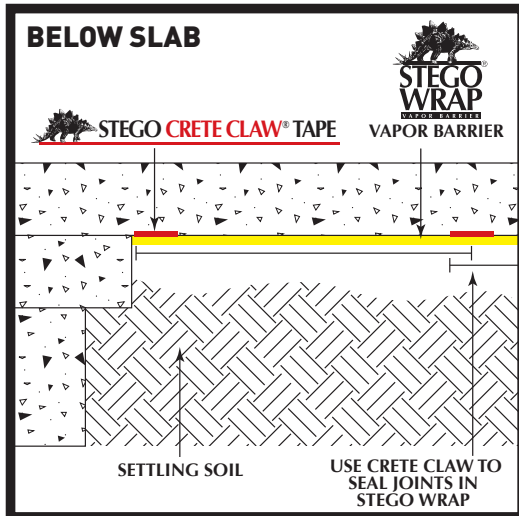
The patent-pending design allows wet concrete to cast into the textured surface of Crete Claw



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.
Shear 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

Stego, the stegosaurus logo, Crete Claw, and StegoTack are all deemed to be registered and protectable trademarks of Stego Industries, LLC.

04/2013

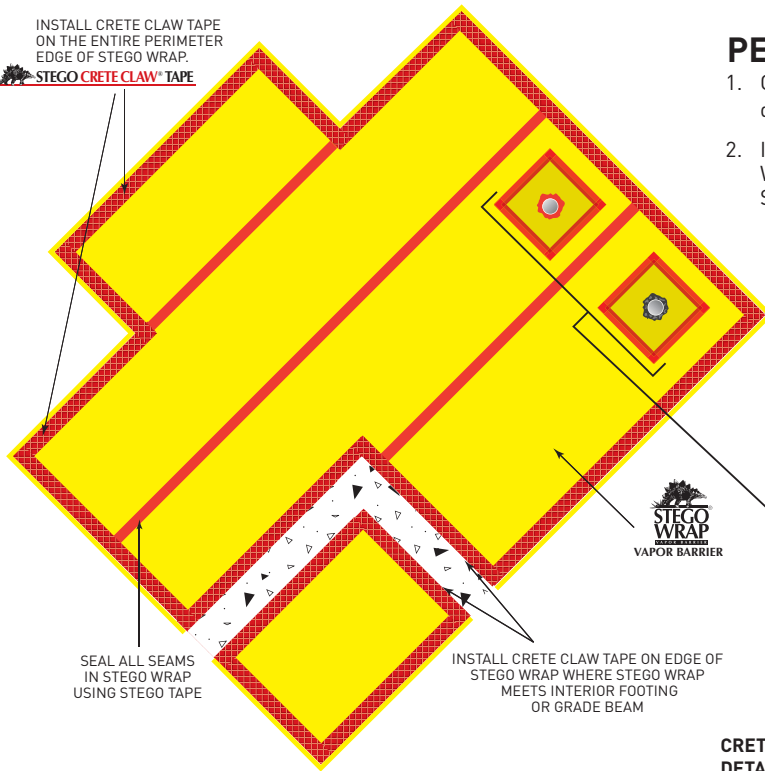
STEGO CRETE CLAW[®] TAPE

INSTALLATION INSTRUCTIONS

TOP-DOWN VIEWS OF A BUILDING FOOTPRINT



INSTALL CRETE CLAW TAPE ON THE ENTIRE PERIMETER EDGE OF STEGO WRAP.
STEGO CRETE CLAW[®] TAPE



SEAL ALL SEAMS IN STEGO WRAP USING STEGO TAPE

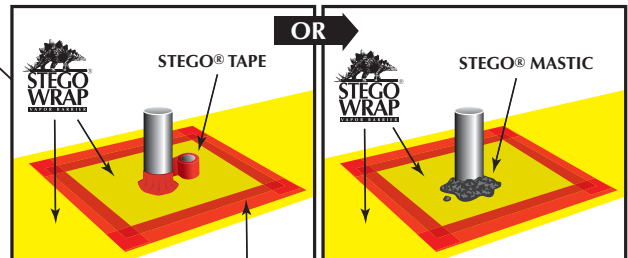
INSTALL CRETE CLAW TAPE ON EDGE OF STEGO WRAP WHERE STEGO WRAP MEETS INTERIOR FOOTING OR GRADE BEAM



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.

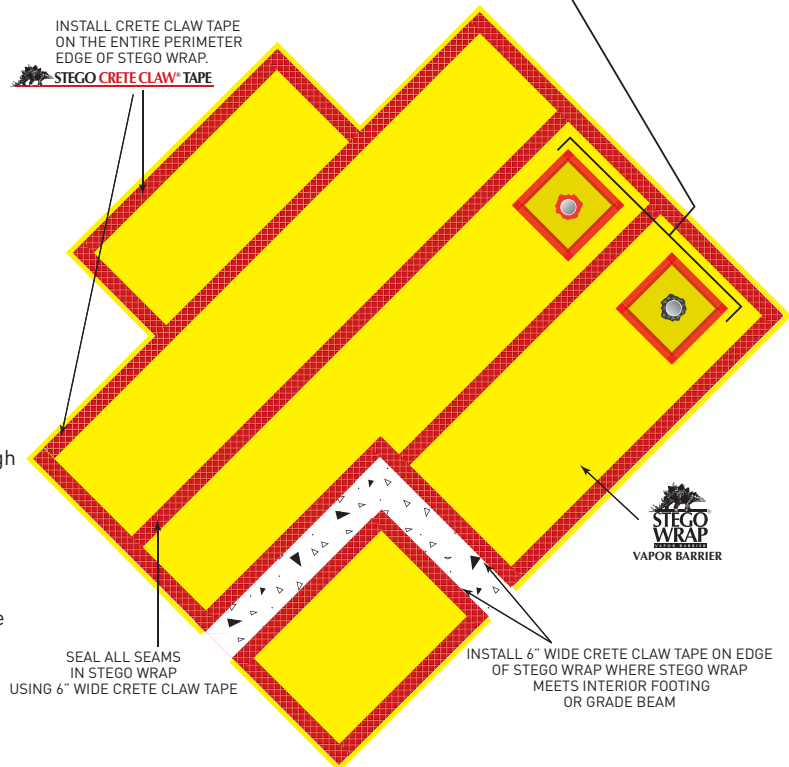
SECURING STEGO WRAP TO THE BOTTOM OF THE SLAB

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.

INSTALL CRETE CLAW TAPE ON THE ENTIRE PERIMETER EDGE OF STEGO WRAP.
STEGO CRETE CLAW[®] TAPE



SEAL ALL SEAMS IN STEGO WRAP USING 6" WIDE CRETE CLAW TAPE

INSTALL 6" WIDE CRETE CLAW TAPE ON EDGE OF STEGO WRAP WHERE STEGO WRAP MEETS INTERIOR FOOTING OR GRADE BEAM



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.
Shear 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.
Shear 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

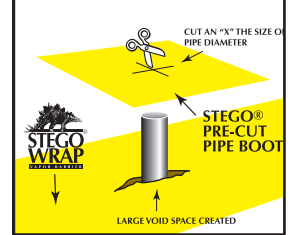
PROPERTY	RESULTS
Dimensions	4 feet long, 1 1/8 inches wide
Color	Red
Material	Recycled PVC
Weight	4.7 oz. (132 grams)





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



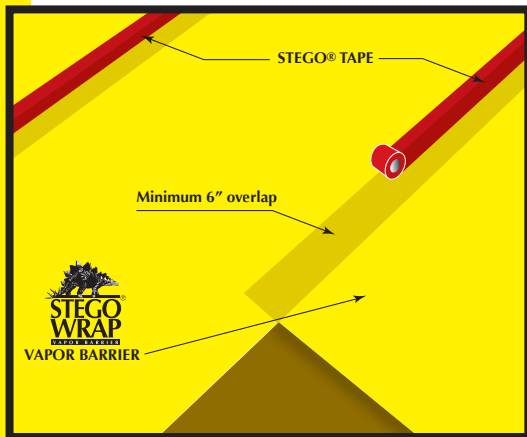
PART 1

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.

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 2a: SEAL TO SLAB AT PERIMETER

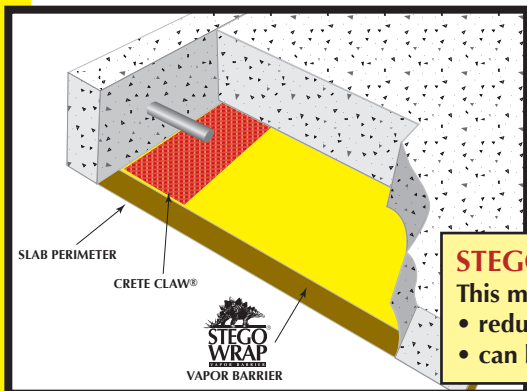


FIGURE 2b: SEAL TO PERIMETER WALL

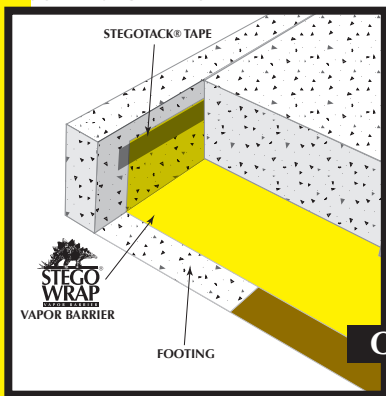
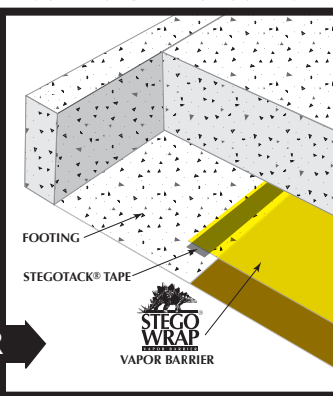


FIGURE 2c: SEAL TO FOOTING



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.

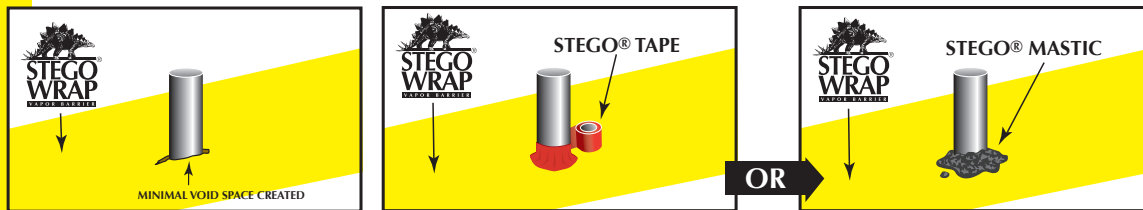
- In the event that Stego Wrap is damaged during or after installation, repairs must be made. Stego Tape can be used to repair small holes in the material. For larger holes, cut a piece of Stego Wrap to a size and shape that covers any damage by a minimum overlap of six inches in all directions. Clean 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



- 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:

- Install Stego Wrap around pipe penetrations by slitting/cutting material as needed. Try to minimize the void space created.
- 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]**
- 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.
- Cut an "X" the size of the pipe diameter in the center of the pipe boot and slide tightly over pipe.
- Tape down all sides of the pipe boot with Stego Tape.
- 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

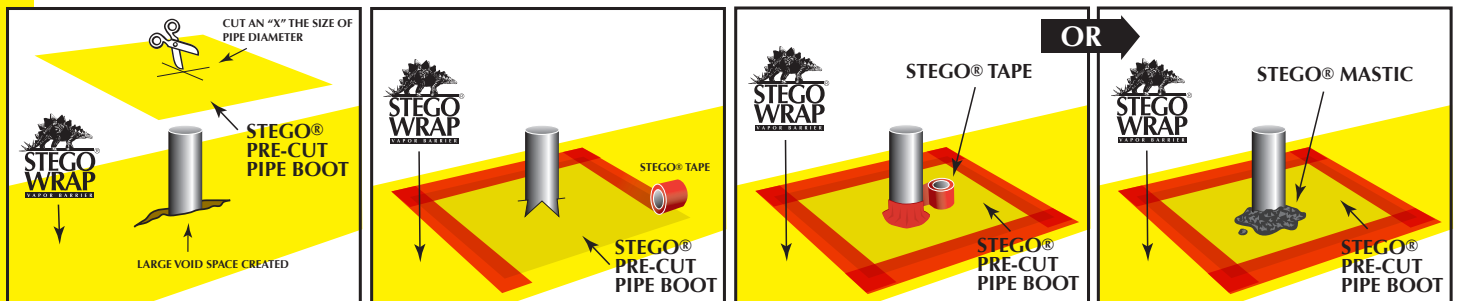
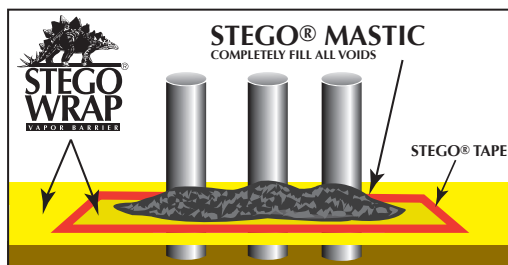


FIGURE 5: MULTIPLE PIPE PENETRATION SEALING



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.

PART 2

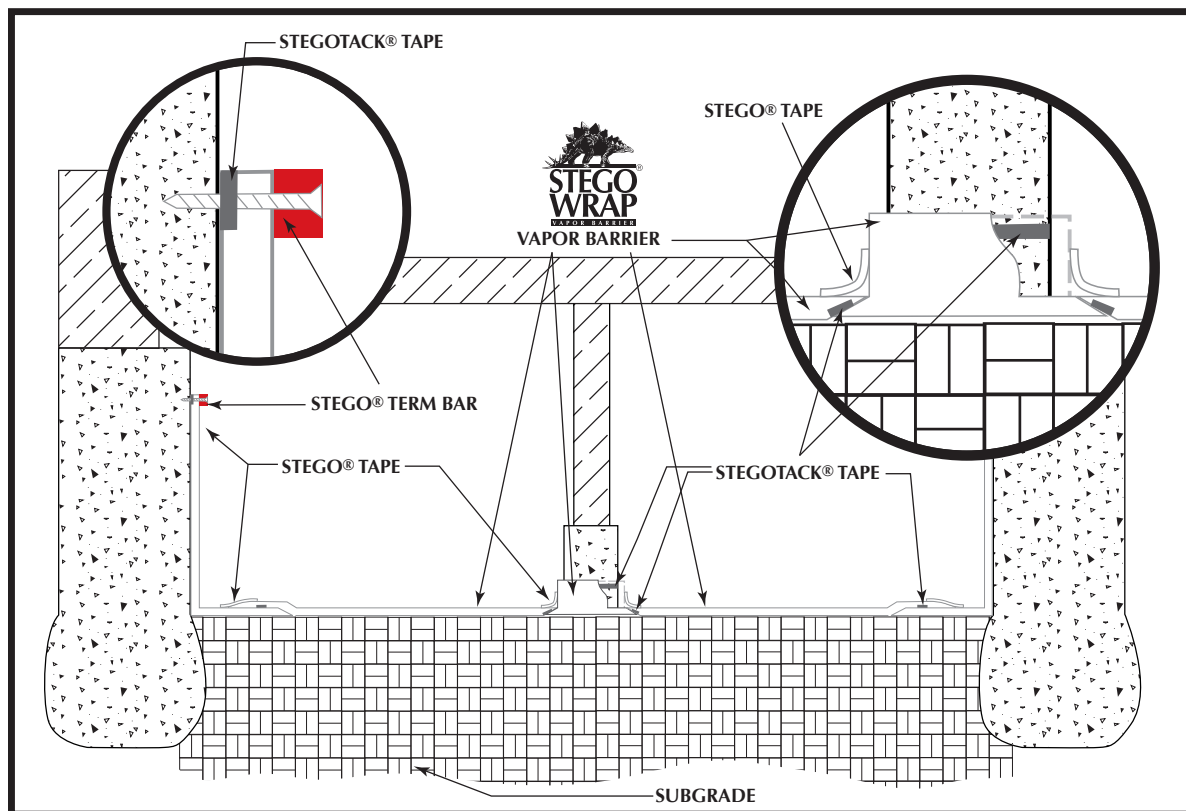
STEGO WRAP VAPOR BARRIER/RETARDER INSTALLATION INSTRUCTIONS



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.

Vulcan
Materials Company
Pleasanton Plant
SMARA 91-01-0010



3/12/2018

To Whom It May Concern:

Vulcan Materials Company (Vulcan) shall furnish aggregates in connection with the above-referenced project. The Typical physical properties of the aggregate are summarized below.

26032 - 3/4" x 1/2" CRUSHED

GRADATION		
SIEVE SIZE	PERCENT PASSING	VMC SPECIFICATION
1" (25.0 mm)	100	100
3/4" (19.0 mm)	86	75-100
1/2" (12.5 mm)	18	5-25
3/8" (9.5 mm)	5	0-10
No. 4 (4.75 mm)	2	0-5
No. 8 (2.36 mm)	2	0-3

PHYSICAL PROPERTIES

TEST METHOD	TEST RESULT
ASTM C 127 - Specific Gravity (SSD)	2.708
Absorption	1.4%
CTM 227 - Cleanness Value	77

Due to the natural segregation of aggregates that occurs during transportation, Vulcan will only guarantee the aggregate gradations at Vulcan's production facility not the project site. Vulcan makes no representations or warranties as to whether this submittal complies with any project specifications or standards set forth in any contracts or design drawings, and is not responsible for obtaining any necessary approvals or certifications for use of these aggregates.

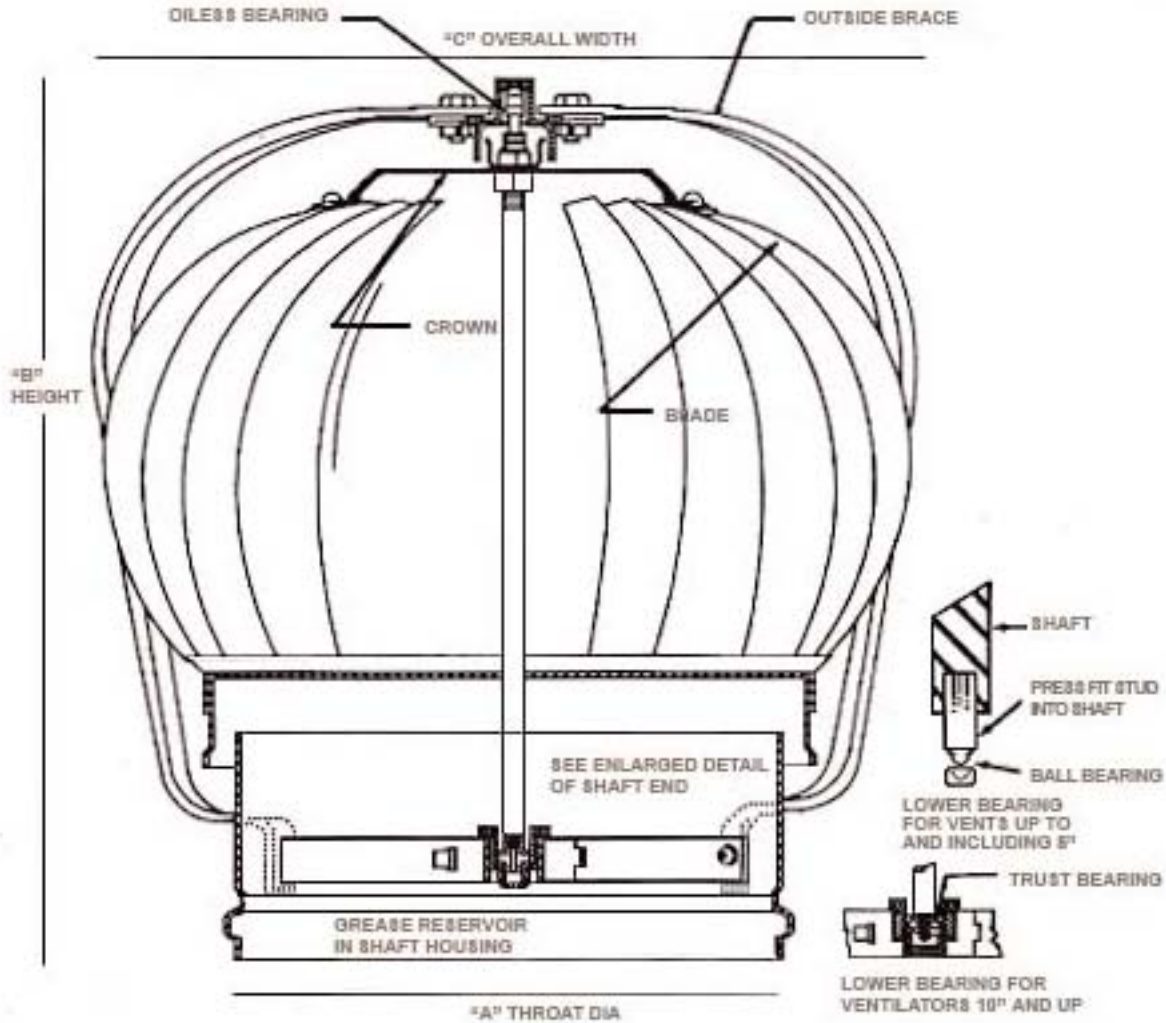
This submittal is valid for 90-days from date of submittal.

Respectfully,
 Vulcan Materials Company
 Technical Services Department
 Pleasanton Regional Laboratory

cc:

VULCAN HEREBY EXCLUDES ALL WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PURPOSE, AND ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, OF THE MATERIAL SOLD BY VULCAN TO BUYER HEREUNDER, OTHER THAN THE APPLICABLE EXPRESS WARRANTY STATED ABOVE. VULCAN MAKES NO WARRANTY OR GUARANTY OF FINISHED WORK WHATSOEVER. IN NO EVENT SHALL VULCAN BE LIABLE OR RESPONSIBLE FOR ANY INDIRECT, INCIDENTAL, CONSEQUENTIAL, SPECIAL, EXEMPLARY, LIQUIDATED OR PUNITIVE DAMAGES, INCLUDING, BUT NOT LIMITED TO, LOST PROFITS, WHETHER SUCH CLAIM IS BASED ON EXPRESS OR IMPLIED WARRANTY, CONTRACT, TORT (INCLUDING NEGLIGENCE) OR OTHERWISE, EVEN IF THE POSSIBILITY OF SUCH DAMAGES HAS BEEN DISCLOSED IN ADVANCE BY BUYER OR COULD HAVE BEEN REASONABLY FORESEEN.

TURBINE VENTILATORS



CONSTRUCTION SPECIFICATIONS

"A" THROAT SIZE	GAUGE			NO. OF BRACES	BRACE MATERIAL
	CROWN GALV.	BLADE GALV.	THROAT GALV.		
4	24	28	26	3	ALUMINUM
6	24	28	26	3	ALUMINUM
8	24	28	26	3	ALUMINUM
10	24	28	26	3	ALUMINUM
12	24	28	24	3	ALUMINUM
14	22	26	24	3	ALUMINUM
16	22	26	24	3	STEEL
18	22	26	24	4	STEEL
20	20	26	24	4	STEEL
24	20	26	22	4	STEEL

DIMENSIONAL AND PERFORMANCE DATA

"A" THROAT SIZE	"B" HEIGHT	"C" OVERALL WIDTH	EXHAUSTED CAPACITY*	APPROX. SHIPPING WEIGHT
4	12	10 1/4	125	5
6	14 1/2	12 3/4	147	7
8	15	14 1/4	255	8
10	16 1/4	16 1/4	425	11
12	17	19	631	13
14	19 3/4	22 3/4	700	21
16	21 3/4	25 1/2	950	31
18	24	29	1200	38
20	25 1/4	31 5/8	1700	46
24	28 1/4	35 3/4	2350	58

*4 MPH WIND CFM

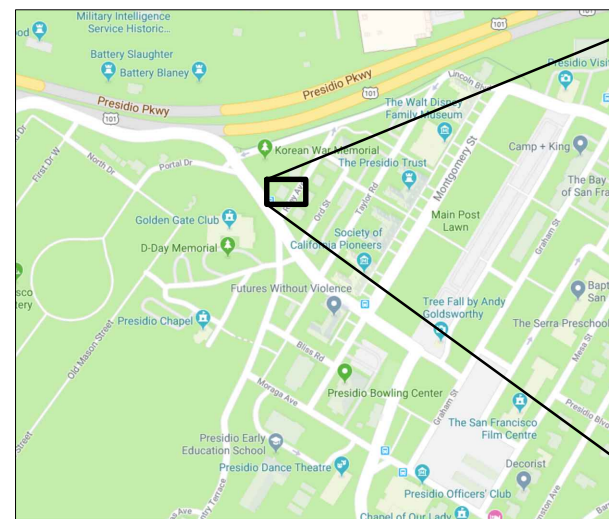
ATTACHMENT D
As-Built Drawings

VAPOR MITIGATION SYSTEM 127B RILEY AVENUE BR11-1 FUEL DISTRIBUTION SYSTEM PRESIDIO OF SAN FRANCISCO SAN FRANCISCO, CALIFORNIA

PREPARED FOR: THE PRESIDIO TRUST
103 MONTGOMERY STREET
SAN FRANCISCO, CALIFORNIA

PREPARED BY: TRC SOLUTIONS, INC.
505 SANSOME STREET, SUITE 1600
SAN FRANCISCO, CALIFORNIA

SHEET INDEX	
SHEET NUMBER	SHEET TITLE
C-1	TITLE SHEET
C-2A	127B SUB-SLAB VENTING SYSTEM PLAN
C-2B	127B SUB-SLAB VENTING SYSTEM DETAILS



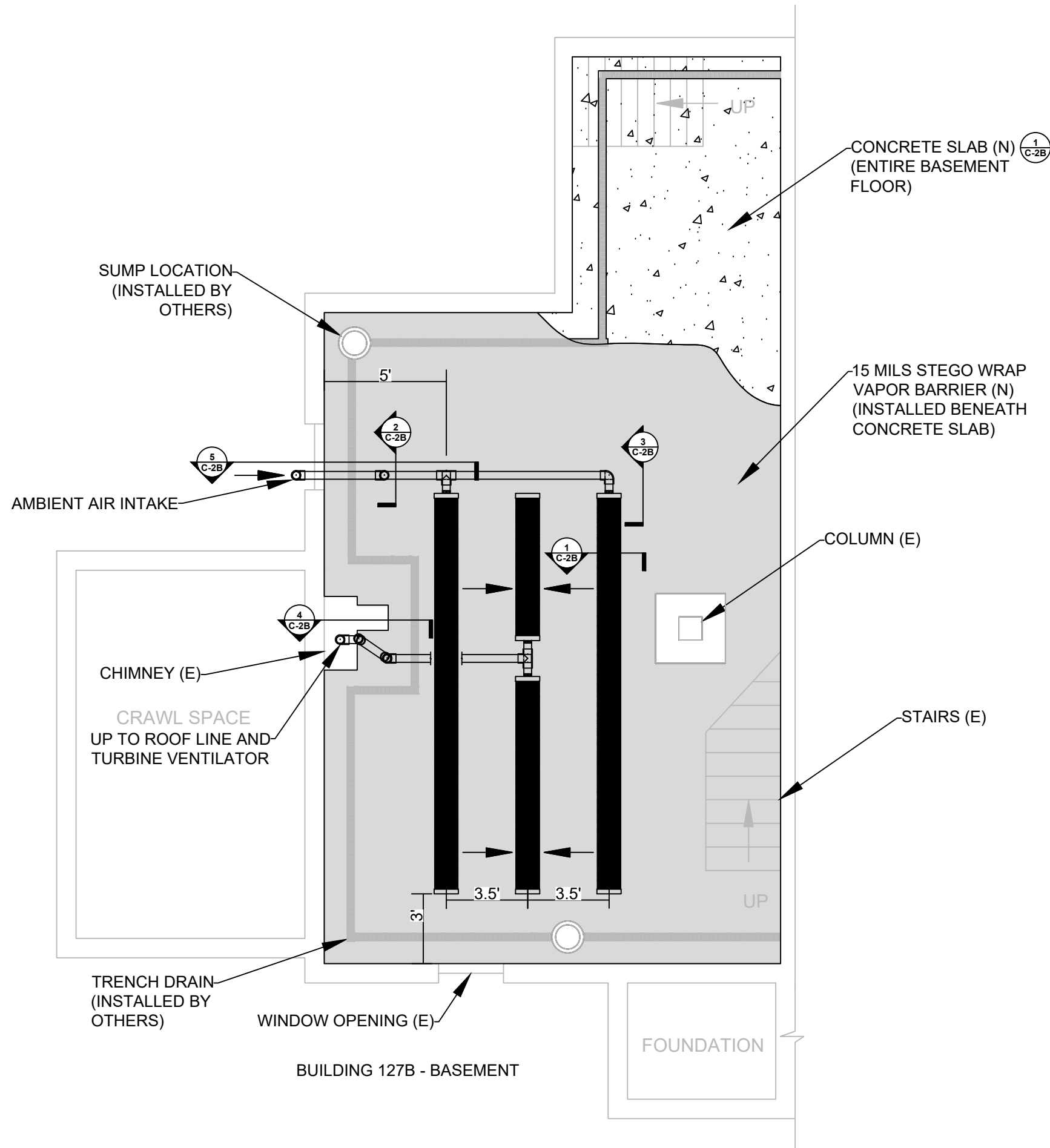
VICINITY MAP (NOT TO SCALE)






SITE MAP (NOT TO SCALE)

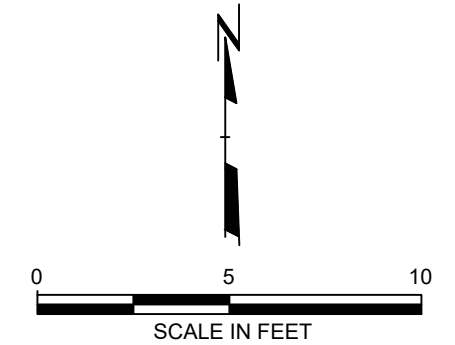
SEAL:		PROFESSIONAL ENGINEER:	
		ALFONSO ANG	
		DATE:	
		05/13/2019	
		License Exp. 09/30/2019	
0	KL	MAY 2019	AS-BUILT
NO.	BY	DATE	REVISION
			APPD.
PROJECT:			
THE PRESIDIO TRUST BR11-1 FUEL DISTRIBUTION SYSTEM RILEY AVENUE, SAN FRANCISCO, CALIFORNIA			
TITLE:			
TITLE SHEET			
DRAWN BY:	K. LI	PROJ NO.:	285830.04A.02
CHECKED BY:	A. ANG	C-1	
APPROVED BY:	A. ANG		
DATE:	MAY 2019		
		505 Sansome Street Suite 1600 San Francisco, CA 94111 Phone: 415.434.2600	
FILE NO.:		C-1 Title Sheet stamped.dwg	



1x17 - USER: P:\p\ang - ATTACHED XREFS: STAMP: ANG-RPE 09/30/19 - ATTACHED IMAGES: DRAWING NAME: \\santiran-fp\SANFRAN\PROJECTS\CAD\Presidio - Riley Ave\Remedial Design\C-2A 127B Sub-Slab Venting System Plan_stamped.dwg -- PLOT DATE: August 26, 2019 - 11:03AM -- LAYOUT: 11X17L



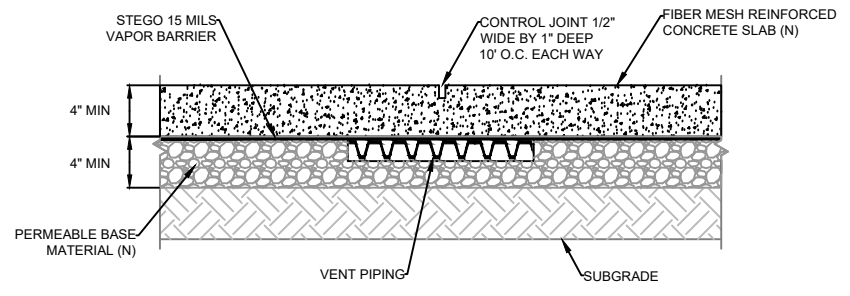
LEGEND

-  SUB-SLAB VAPOR VENT PIPING
-  STEGO SOIL VAPOR BARRIER
-  AIR FLOW

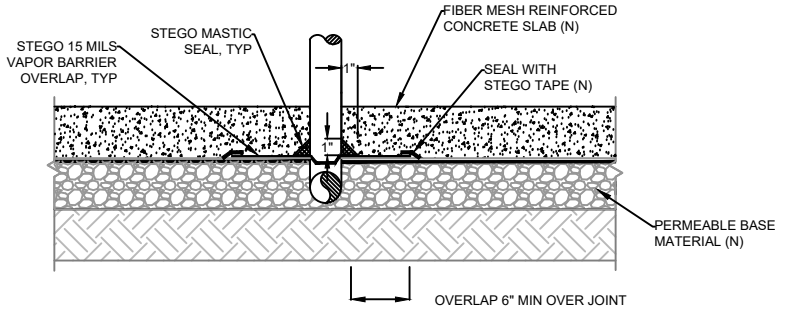


SEAL:		PROFESSIONAL ENGINEER:		
		ALFONSO ANG		
		DATE:		
		05/13/2019		
		License Exp. 09/30/2019		
0	KL	MAY 2019	AS-BUILT	AA
NO.	BY	DATE	REVISION	APPD.
PROJECT: THE PRESIDIO TRUST BR11-1 FUEL DISTRIBUTION SYSTEM RILEY AVENUE, SAN FRANCISCO, CALIFORNIA				
TITLE: 127B SUB-SLAB VENTING SYSTEM PLAN				
DRAWN BY: K. LI		PROJ NO.: 285830.04A.02		
CHECKED BY: A. ANG		C-2A		
APPROVED BY: A. ANG				
DATE: MAY 2019				
		505 Sansome Street Suite 1600 San Francisco, CA 94111 Phone: 415.434.2600		
		FILE NO.: C-2A 127B Sub-Slab Venting System Plan stamped.dwg		

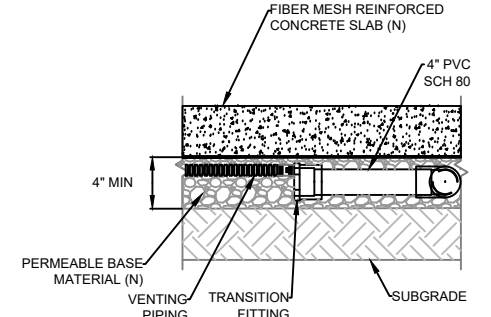
1x17 - USER: P:\p\ang - ATTACHED XREFS: STAMP-ANG-REF-09-30-19 - ATTACHED IMAGES: R:\Drawings\127B Sub-Slab Venting System Details - stamped.dwg --- PLOT DATE: August 26, 2019 - 11:03AM --- LAYOUT: 11X17L
DRAWING NAME: I:\sfr\ran\proj\127B Sub-Slab Venting System Details - stamped.dwg



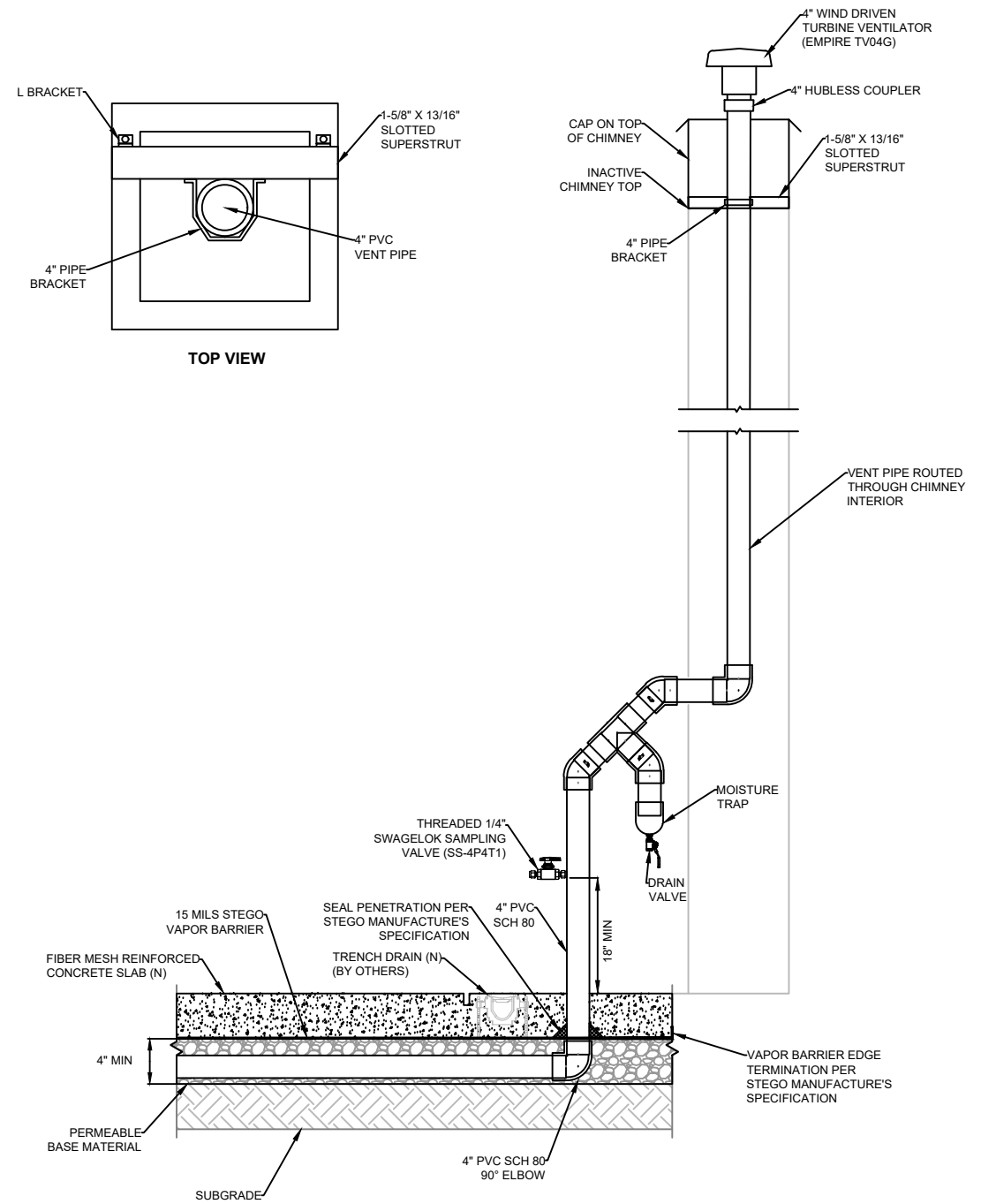
1
C-2A
TYPICAL VENT PIPE AND CONCRETE SLAB
(NOT TO SCALE)



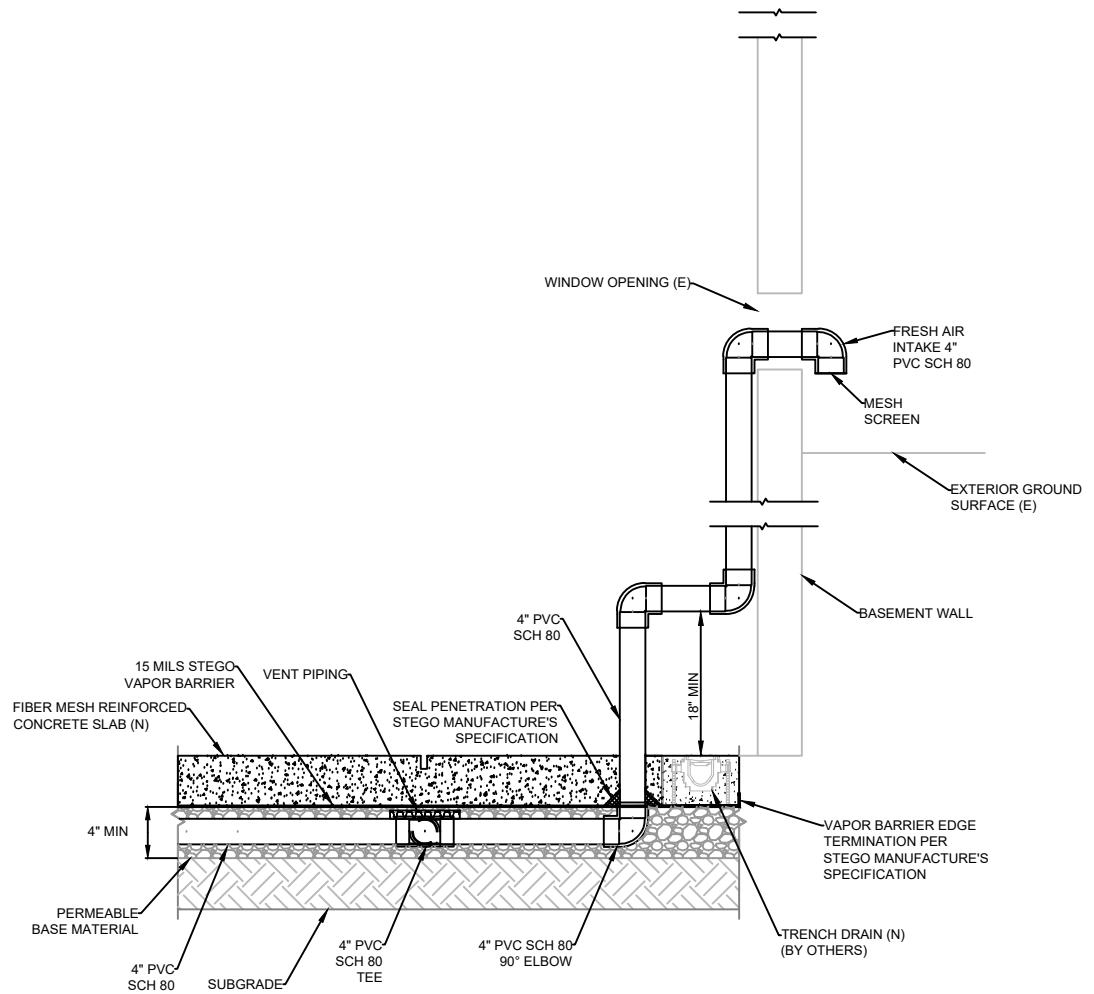
2
C-2A
TYPICAL VENT PIPE SLAB PENETRATION
(NOT TO SCALE)



3
C-2A
SUB-SLAB PIPING TRANSITION
(NOT TO SCALE)



4
C-2A
VENT PIPING
(NOT TO SCALE)



5
C-2A
AIR INTAKE PIPING
(NOT TO SCALE)

SEAL:	
	PROFESSIONAL ENGINEER:
	ALFONSO ANG
	DATE: 05/13/2019
License Exp. 09/30/2019	

0	KL	MAY 2019	AS-BUILT		AA
NO.	BY	DATE	REVISION		APP'D.

PROJECT: **THE PRESIDIO TRUST
BR11-1 FUEL DISTRIBUTION SYSTEM
RILEY AVENUE, SAN FRANCISCO, CALIFORNIA**

TITLE: **127B SUB-SLAB VENTING SYSTEM DETAILS**

DRAWN BY:	K. LI	PROJ NO.:	285830.04A.02
CHECKED BY:	A. ANG	C-2B	
APPROVED BY:	A. ANG		
DATE:	MAY 2019		

505 Sansome Street
Suite 1600
San Francisco, CA 94111
Phone: 415.434.2600

FILE NO.: C-2B 127B Sub-Slab Venting System Details stamped.dwg

ATTACHMENT E
Construction Photographs

Attachment E Construction Photographs



Photo 1: Initial VMS Layout and Trenching



Photo 2: VMS subsurface piping



Photo 3: Trenching

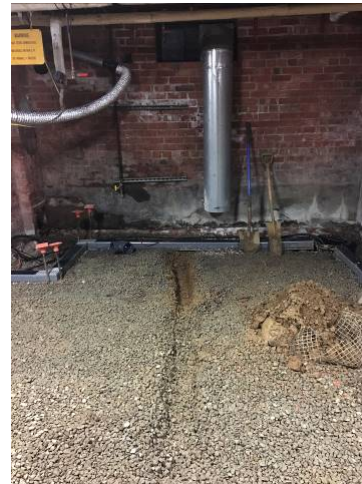



Photo 4: Trenching



Photo 5: VMS Piping Installation



Photo 6: VMS Piping Installation

TRC Job No.	Photographs Taken By:	Page No.	Client:	Site Name & Address:	
285830	TRC Solutions, Inc.	1 of 6	Presidio Trust	Building 127B Riley Avenue – VMS Const.	

Attachment E Construction Photographs



Photo 7: VMS Piping Installation



Photo 8: VMS Piping Installation



Photo 9: Fresh Air Intake




Photo 10: Vent Riser



Photo 11: Vapor Barrier Installation



Photo 12: Vapor Barrier Installation

TRC Job No.	Photographs Taken By:	Page No.	Client:	Site Name & Address:	
285830	TRC Solutions, Inc.	2 of 6	Presidio Trust	Building 127B Riley Avenue – VMS Const.	

**Attachment E
Construction Photographs**



Photo 13: Vent Riser Penetration Sealing



Photo 14: Pre-concrete



Photo 15: Concrete slab installation.



Photo 16: Concrete slab installation.



Photo 17: Concrete slab installation.

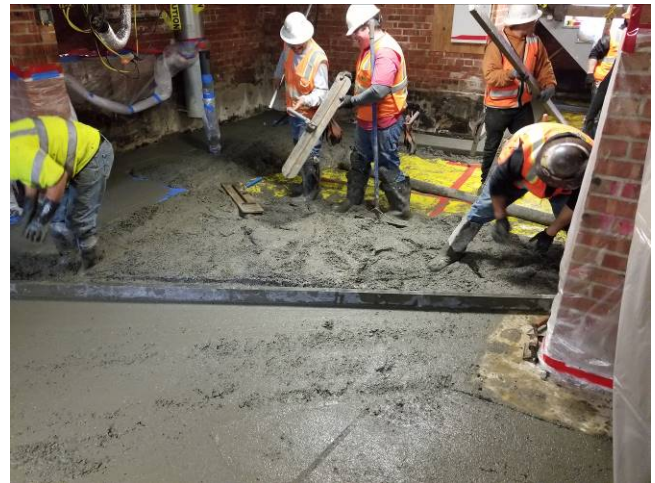



Photo 18: Concrete slab installation.

TRC Job No.	Photographs Taken By:	Page No.	Client:	Site Name & Address:	
285830	TRC Solutions, Inc.	3 of 6	Presidio Trust	Building 127B Riley Avenue – VMS Const.	

Attachment E Construction Photographs



Photo 19: Concrete Slab Installation



Photo 20: Concrete Slab Installation



Photo 21: Concrete Slab Installation



Photo 22: Concrete Slab Installation

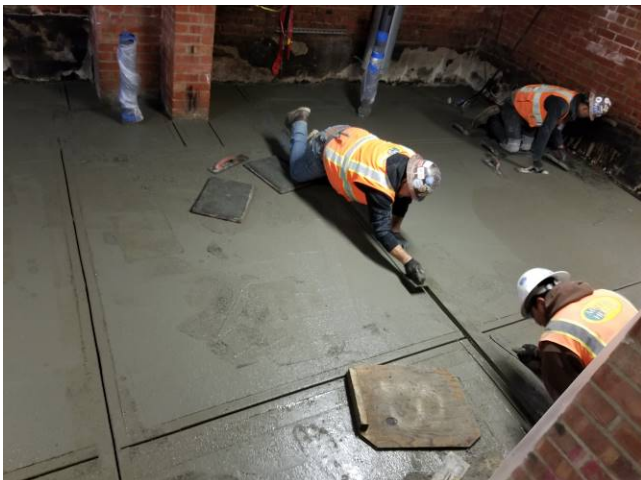


Photo 23: Concrete Slab Installation

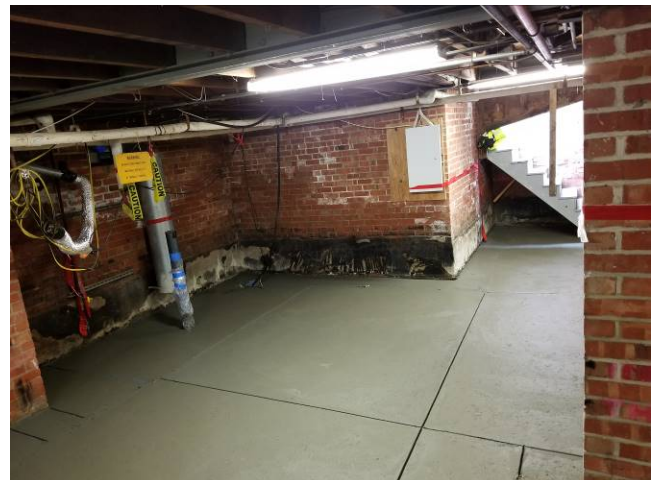



Photo 24: Concrete Slab Installation

TRC Job No.	Photographs Taken By:	Page No.	Client:	Site Name & Address:	
285830	TRC Solutions, Inc.	4 of 6	Presidio Trust	Building 127B Riley Avenue – VMS Const.	

Attachment E Construction Photographs



Photo 25: Concrete Slab



Photo 26: Concrete Slab



Photo 27: Concrete Slab



Photo 28: Concrete Slab



Photo 29: Concrete Slab (cured)

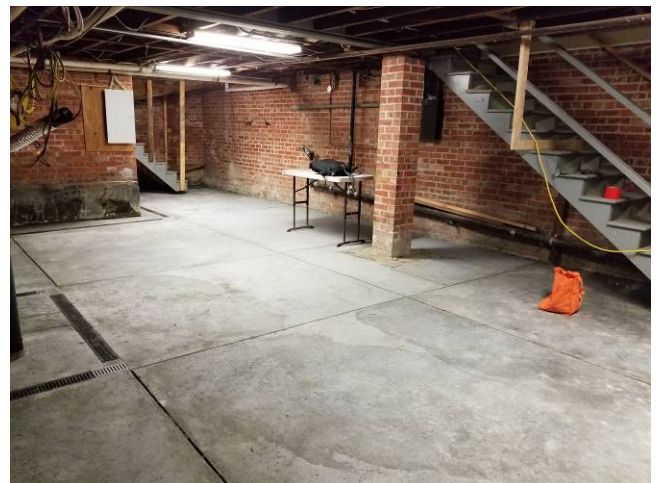



Photo 30: Concrete Slab (cured)

TRC Job No.	Photographs Taken By:	Page No.	Client:	Site Name & Address:	
285830	TRC Solutions, Inc.	5 of 6	Presidio Trust	Building 127B Riley Avenue – VMS Const.	

Attachment E Construction Photographs



Photo 31: Fresh Air Intake



Photo 32: Fresh Air Intake



Photo 33: Vent Riser




Photo 34: Vent Riser



Photo 35: Vent Riser (top of chimney)



Photo 36: Wind-driven Ventilator

TRC Job No.	Photographs Taken By:	Page No.	Client:	Site Name & Address:	
285830	TRC Solutions, Inc.	6 of 6	Presidio Trust	Building 127B Riley Avenue – VMS Const.	

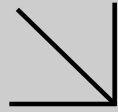
ATTACHMENT F
Laboratory Analytical Reports



Calscience

Supplemental Report 1

The original report has been revised/corrected.



WORK ORDER NUMBER: 19-04-0344

The difference is service



AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: TRC Solutions

Client Project Name: 285830.02A.03

Attention: Alfonso Ang
2300 Clayton Road
Suite 610
Concord, CA 94520-2142

Approved for release on 04/15/2019 by:
Lori Thompson
Project Manager

ResultLink ▶

Email your PM ▶

Eurofins Calscience (Calscience) certifies that the test results provided in this report meet all NELAC Institute requirements for parameters for which accreditation is required or available. Any exceptions to NELAC Institute requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.

Contents

Client Project Name: 285830.02A.03
 Work Order Number: 19-04-0344

1	Work Order Narrative.	3
2	Sample Summary.	4
3	Client Sample Data.	5
	3.1 ASTM D-1946 Fixed Gases (Air).	5
	3.2 EPA TO-15 Full List (Air).	8
	3.3 EPA TO-15 SIM (Air).	9
	3.4 EPA TO-3 (M) TPH Gasoline (Air).	14
4	Quality Control Sample Data.	16
	4.1 Sample Duplicate.	16
	4.2 LCS/LCSD.	17
5	Summa Canister Vacuum Summary.	22
6	Sample Analysis Summary.	23
7	Glossary of Terms and Qualifiers.	24
8	Chain-of-Custody/Sample Receipt Form.	25

Work Order Narrative

Work Order: 19-04-0344

Page 1 of 1

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 04/04/19. They were assigned to Work Order 19-04-0344.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of ≤ 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.



Calscience

Sample Summary

Client: TRC Solutions	Work Order:	19-04-0344
2300 Clayton Road, Suite 610	Project Name:	285830.02A.03
Concord, CA 94520-2142	PO Number:	118986
	Date/Time Received:	04/04/19 10:00
	Number of Containers:	9

Attn: Alfonso Ang

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
127BIA01	19-04-0344-1	04/03/19 09:51	1	Air
127BIA02	19-04-0344-2	04/03/19 09:52	1	Air
127BIA03	19-04-0344-3	04/03/19 07:37	1	Air
127BIA04	19-04-0344-4	04/03/19 08:12	1	Air
DUP04022019-01	19-04-0344-5	04/03/19 09:51	1	Air
BR11-1 AA01	19-04-0344-6	04/03/19 07:42	1	Air
BR11-1 AA03	19-04-0344-7	04/03/19 07:30	1	Air
BR11-1 AA05	19-04-0344-8	04/03/19 09:50	1	Air
127BSSV01	19-04-0344-9	04/02/19 14:10	1	Air

Return to Contents



Calscience

Analytical Report

TRC Solutions
2300 Clayton Road, Suite 610
Concord, CA 94520-2142

Date Received: 04/04/19
Work Order: 19-04-0344
Preparation: N/A
Method: ASTM D-1946
Units: %v

Project: 285830.02A.03

Page 1 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
127BIA01	19-04-0344-1-A	04/03/19 09:51	Air	GC 65	N/A	04/04/19 18:44	190404L01

Parameter	Result	RL	DF	Qualifiers
Methane	ND	0.500	1.00	
Carbon Dioxide	ND	0.500	1.00	
Carbon Monoxide	ND	0.500	1.00	
Oxygen (+ Argon)	21.4	0.500	1.00	
Nitrogen	78.6	0.500	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
127BIA02	19-04-0344-2-A	04/03/19 09:52	Air	GC 65	N/A	04/04/19 19:02	190404L01

Parameter	Result	RL	DF	Qualifiers
Methane	ND	0.500	1.00	
Carbon Dioxide	ND	0.500	1.00	
Carbon Monoxide	ND	0.500	1.00	
Oxygen (+ Argon)	21.4	0.500	1.00	
Nitrogen	78.6	0.500	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
127BIA03	19-04-0344-3-A	04/03/19 07:37	Air	GC 65	N/A	04/04/19 19:21	190404L01

Parameter	Result	RL	DF	Qualifiers
Methane	ND	0.500	1.00	
Carbon Dioxide	ND	0.500	1.00	
Carbon Monoxide	ND	0.500	1.00	
Oxygen (+ Argon)	21.4	0.500	1.00	
Nitrogen	78.6	0.500	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
127BIA04	19-04-0344-4-A	04/03/19 08:12	Air	GC 65	N/A	04/04/19 19:39	190404L01

Parameter	Result	RL	DF	Qualifiers
Methane	ND	0.500	1.00	
Carbon Dioxide	ND	0.500	1.00	
Carbon Monoxide	ND	0.500	1.00	
Oxygen (+ Argon)	21.4	0.500	1.00	
Nitrogen	78.6	0.500	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

TRC Solutions
2300 Clayton Road, Suite 610
Concord, CA 94520-2142

Date Received: 04/04/19
Work Order: 19-04-0344
Preparation: N/A
Method: ASTM D-1946
Units: %v

Project: 285830.02A.03

Page 2 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
DUP04022019-01	19-04-0344-5-A	04/03/19 09:51	Air	GC 65	N/A	04/04/19 19:57	190404L01

Parameter	Result	RL	DF	Qualifiers
Methane	ND	0.500	1.00	
Carbon Dioxide	ND	0.500	1.00	
Carbon Monoxide	ND	0.500	1.00	
Oxygen (+ Argon)	21.4	0.500	1.00	
Nitrogen	78.6	0.500	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BR11-1 AA01	19-04-0344-6-A	04/03/19 07:42	Air	GC 65	N/A	04/04/19 20:15	190404L01

Parameter	Result	RL	DF	Qualifiers
Methane	ND	0.500	1.00	
Carbon Dioxide	ND	0.500	1.00	
Carbon Monoxide	ND	0.500	1.00	
Oxygen (+ Argon)	21.4	0.500	1.00	
Nitrogen	78.6	0.500	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BR11-1 AA03	19-04-0344-7-A	04/03/19 07:30	Air	GC 65	N/A	04/04/19 20:33	190404L01

Parameter	Result	RL	DF	Qualifiers
Methane	ND	0.500	1.00	
Carbon Dioxide	ND	0.500	1.00	
Carbon Monoxide	ND	0.500	1.00	
Oxygen (+ Argon)	21.4	0.500	1.00	
Nitrogen	78.6	0.500	1.00	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BR11-1 AA05	19-04-0344-8-A	04/03/19 09:50	Air	GC 65	N/A	04/04/19 20:52	190404L01

Parameter	Result	RL	DF	Qualifiers
Methane	ND	0.500	1.00	
Carbon Dioxide	ND	0.500	1.00	
Carbon Monoxide	ND	0.500	1.00	
Oxygen (+ Argon)	21.4	0.500	1.00	
Nitrogen	78.6	0.500	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

TRC Solutions
2300 Clayton Road, Suite 610
Concord, CA 94520-2142

Date Received: 04/04/19
Work Order: 19-04-0344
Preparation: N/A
Method: ASTM D-1946
Units: %v

Project: 285830.02A.03

Page 3 of 3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
127BSSV01	19-04-0344-9-A	04/02/19 14:10	Air	GC 65	N/A	04/05/19 13:56	190405L01

Parameter	Result	RL	DF	Qualifiers
Methane	ND	0.500	1.00	
Carbon Dioxide	ND	0.500	1.00	
Carbon Monoxide	ND	0.500	1.00	
Oxygen (+ Argon)	21.4	0.500	1.00	
Nitrogen	78.6	0.500	1.00	

Method Blank	099-16-444-949	N/A	Air	GC 65	N/A	04/04/19 12:13	190404L01
--------------	----------------	-----	-----	-------	-----	-------------------	-----------

Parameter	Result	RL	DF	Qualifiers
Methane	ND	0.500	1.00	
Carbon Dioxide	ND	0.500	1.00	
Carbon Monoxide	ND	0.500	1.00	
Oxygen (+ Argon)	ND	0.500	1.00	
Nitrogen	ND	0.500	1.00	

Method Blank	099-16-444-950	N/A	Air	GC 65	N/A	04/05/19 13:19	190405L01
--------------	----------------	-----	-----	-------	-----	-------------------	-----------

Parameter	Result	RL	DF	Qualifiers
Methane	ND	0.500	1.00	
Carbon Dioxide	ND	0.500	1.00	
Carbon Monoxide	ND	0.500	1.00	
Oxygen (+ Argon)	ND	0.500	1.00	
Nitrogen	ND	0.500	1.00	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

TRC Solutions
2300 Clayton Road, Suite 610
Concord, CA 94520-2142

Date Received: 04/04/19
Work Order: 19-04-0344
Preparation: N/A
Method: EPA TO-15
Units: ug/m3

Project: 285830.02A.03

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
127BSSV01	19-04-0344-9-A	04/02/19 14:10	Air	GC/MS OOO	N/A	04/05/19 22:27	190405L02

Parameter	Result	RL	DF	Qualifiers
Benzene	11	1.6	1.00	
Toluene	27	1.9	1.00	
Ethylbenzene	5.1	2.2	1.00	
p/m-Xylene	38	17	1.00	
o-Xylene	16	8.7	1.00	
Naphthalene	ND	26	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	98	57-129	
1,2-Dichloroethane-d4	93	47-137	
Toluene-d8	97	78-156	

Method Blank	099-15-765-131	N/A	Air	GC/MS OOO	N/A	04/05/19 16:29	190405L02
--------------	----------------	-----	-----	-----------	-----	-------------------	-----------

Parameter	Result	RL	DF	Qualifiers
Benzene	ND	1.6	1.00	
Toluene	ND	1.9	1.00	
Ethylbenzene	ND	2.2	1.00	
p/m-Xylene	ND	17	1.00	
o-Xylene	ND	8.7	1.00	
Naphthalene	ND	26	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	92	57-129	
1,2-Dichloroethane-d4	91	47-137	
Toluene-d8	97	78-156	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

TRC Solutions
2300 Clayton Road, Suite 610
Concord, CA 94520-2142

Date Received: 04/04/19
Work Order: 19-04-0344
Preparation: N/A
Method: EPA TO-15 SIM
Units: ug/m3

Project: 285830.02A.03

Page 1 of 5

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
127BIA01	19-04-0344-1-A	04/03/19 09:51	Air	GC/MS YY	N/A	04/04/19 21:30	190404L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Benzene	0.23	0.080	0.041	1.00	
Toluene	0.41	0.19	0.058	1.00	
Ethylbenzene	0.064	0.11	0.053	1.00	J
p/m-Xylene	0.18	0.22	0.11	1.00	J
o-Xylene	0.079	0.11	0.056	1.00	J
Naphthalene	ND	0.26	0.17	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	87	45-153	
1,2-Dichloroethane-d4	77	37-163	
Toluene-d8	105	73-121	

127BIA02	19-04-0344-2-A	04/03/19 09:52	Air	GC/MS YY	N/A	04/04/19 22:23	190404L02
----------	----------------	-------------------	-----	----------	-----	-------------------	-----------

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Benzene	0.30	0.080	0.041	1.00	
Toluene	1.1	0.19	0.058	1.00	
Ethylbenzene	0.22	0.11	0.053	1.00	
p/m-Xylene	0.89	0.22	0.11	1.00	
o-Xylene	0.46	0.11	0.056	1.00	
Naphthalene	ND	0.26	0.17	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	89	45-153	
1,2-Dichloroethane-d4	82	37-163	
Toluene-d8	110	73-121	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

TRC Solutions
2300 Clayton Road, Suite 610
Concord, CA 94520-2142

Date Received: 04/04/19
Work Order: 19-04-0344
Preparation: N/A
Method: EPA TO-15 SIM
Units: ug/m3

Project: 285830.02A.03

Page 2 of 5

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
127BIA03	19-04-0344-3-A	04/03/19 07:37	Air	GC/MS YY	N/A	04/04/19 23:15	190404L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Benzene	0.31	0.080	0.041	1.00	
Toluene	0.79	0.19	0.058	1.00	
Ethylbenzene	0.17	0.11	0.053	1.00	
p/m-Xylene	0.58	0.22	0.11	1.00	
o-Xylene	0.34	0.11	0.056	1.00	
Naphthalene	ND	0.26	0.17	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	90	45-153	
1,2-Dichloroethane-d4	79	37-163	
Toluene-d8	108	73-121	

127BIA04	19-04-0344-4-A	04/03/19 08:12	Air	GC/MS YY	N/A	04/05/19 00:08	190404L02
----------	----------------	-------------------	-----	----------	-----	-------------------	-----------

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Benzene	0.28	0.080	0.041	1.00	
Toluene	0.78	0.19	0.058	1.00	
Ethylbenzene	0.17	0.11	0.053	1.00	
p/m-Xylene	0.61	0.22	0.11	1.00	
o-Xylene	0.35	0.11	0.056	1.00	
Naphthalene	ND	0.26	0.17	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	90	45-153	
1,2-Dichloroethane-d4	86	37-163	
Toluene-d8	110	73-121	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

TRC Solutions
2300 Clayton Road, Suite 610
Concord, CA 94520-2142

Date Received: 04/04/19
Work Order: 19-04-0344
Preparation: N/A
Method: EPA TO-15 SIM
Units: ug/m3

Project: 285830.02A.03

Page 3 of 5

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
DUP04022019-01	19-04-0344-5-A	04/03/19 09:51	Air	GC/MS YY	N/A	04/05/19 01:02	190404L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Benzene	0.21	0.080	0.041	1.00	
Toluene	0.43	0.19	0.058	1.00	
Ethylbenzene	0.071	0.11	0.053	1.00	J
p/m-Xylene	0.20	0.22	0.11	1.00	J
o-Xylene	0.084	0.11	0.056	1.00	J
Naphthalene	ND	0.26	0.17	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	90	45-153	
1,2-Dichloroethane-d4	74	37-163	
Toluene-d8	111	73-121	

BR11-1 AA01	19-04-0344-6-A	04/03/19 07:42	Air	GC/MS YY	N/A	04/05/19 01:53	190404L02
-------------	----------------	-------------------	-----	----------	-----	-------------------	-----------

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Benzene	1.1	0.080	0.041	1.00	
Toluene	6.0	0.19	0.058	1.00	
Ethylbenzene	1.7	0.11	0.053	1.00	
p/m-Xylene	5.7	0.22	0.11	1.00	
o-Xylene	2.4	0.11	0.056	1.00	
Naphthalene	0.65	0.26	0.17	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	96	45-153	
1,2-Dichloroethane-d4	71	37-163	
Toluene-d8	114	73-121	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

TRC Solutions
2300 Clayton Road, Suite 610
Concord, CA 94520-2142

Date Received: 04/04/19
Work Order: 19-04-0344
Preparation: N/A
Method: EPA TO-15 SIM
Units: ug/m3

Project: 285830.02A.03

Page 4 of 5

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BR11-1 AA03	19-04-0344-7-A	04/03/19 07:30	Air	GC/MS YY	N/A	04/05/19 02:45	190404L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Benzene	ND	0.080	0.041	1.00	
Toluene	ND	0.19	0.058	1.00	
Ethylbenzene	ND	0.11	0.053	1.00	
p/m-Xylene	ND	0.22	0.11	1.00	
o-Xylene	ND	0.11	0.056	1.00	
Naphthalene	ND	0.26	0.17	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	94	45-153	
1,2-Dichloroethane-d4	87	37-163	
Toluene-d8	104	73-121	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
BR11-1 AA05	19-04-0344-8-A	04/03/19 09:50	Air	GC/MS YY	N/A	04/05/19 03:36	190404L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Benzene	ND	0.080	0.041	1.00	
Toluene	ND	0.19	0.058	1.00	
Ethylbenzene	ND	0.11	0.053	1.00	
p/m-Xylene	ND	0.22	0.11	1.00	
o-Xylene	ND	0.11	0.056	1.00	
Naphthalene	ND	0.26	0.17	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	88	45-153	
1,2-Dichloroethane-d4	81	37-163	
Toluene-d8	102	73-121	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

Analytical Report

TRC Solutions
2300 Clayton Road, Suite 610
Concord, CA 94520-2142

Date Received: 04/04/19
Work Order: 19-04-0344
Preparation: N/A
Method: EPA TO-15 SIM
Units: ug/m3

Project: 285830.02A.03

Page 5 of 5

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-15-775-62	N/A	Air	GC/MS YY	N/A	04/04/19 18:02	190404L02

Comment(s): - Results were evaluated to the MDL (DL), concentrations \geq to the MDL (DL) but $<$ RL (LOQ), if found, are qualified with a "J" flag.

Parameter	Result	RL	MDL	DF	Qualifiers
Benzene	ND	0.080	0.041	1.00	
Toluene	ND	0.19	0.058	1.00	
Ethylbenzene	ND	0.11	0.053	1.00	
p/m-Xylene	ND	0.22	0.11	1.00	
o-Xylene	ND	0.11	0.056	1.00	
Naphthalene	ND	0.26	0.17	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	95	45-153	
1,2-Dichloroethane-d4	103	37-163	
Toluene-d8	100	73-121	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

TRC Solutions
2300 Clayton Road, Suite 610
Concord, CA 94520-2142

Date Received: 04/04/19
Work Order: 19-04-0344
Preparation: N/A
Method: EPA TO-3M
Units: ug/m3

Project: 285830.02A.03

Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
127BIA01	19-04-0344-1-A	04/03/19 09:51	Air	GC 13	N/A	04/04/19 20:08	190404L01
<u>Parameter</u>		<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>		
TPH as Gasoline		ND	930	1.00			
127BIA02	19-04-0344-2-A	04/03/19 09:52	Air	GC 13	N/A	04/04/19 18:17	190404L01
<u>Parameter</u>		<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>		
TPH as Gasoline		ND	930	1.00			
127BIA03	19-04-0344-3-A	04/03/19 07:37	Air	GC 13	N/A	04/04/19 18:31	190404L01
<u>Parameter</u>		<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>		
TPH as Gasoline		ND	930	1.00			
127BIA04	19-04-0344-4-A	04/03/19 08:12	Air	GC 13	N/A	04/04/19 18:41	190404L01
<u>Parameter</u>		<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>		
TPH as Gasoline		ND	930	1.00			
DUP04022019-01	19-04-0344-5-A	04/03/19 09:51	Air	GC 13	N/A	04/04/19 19:57	190404L01
<u>Parameter</u>		<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>		
TPH as Gasoline		ND	930	1.00			
BR11-1 AA01	19-04-0344-6-A	04/03/19 07:42	Air	GC 13	N/A	04/04/19 19:02	190404L01
<u>Parameter</u>		<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>		
TPH as Gasoline		3700	930	1.00			
BR11-1 AA03	19-04-0344-7-A	04/03/19 07:30	Air	GC 13	N/A	04/04/19 19:14	190404L01
<u>Parameter</u>		<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>		
TPH as Gasoline		4800	930	1.00			
BR11-1 AA05	19-04-0344-8-A	04/03/19 09:50	Air	GC 13	N/A	04/04/19 19:25	190404L01
<u>Parameter</u>		<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>		
TPH as Gasoline		4700	930	1.00			

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Analytical Report

TRC Solutions
 2300 Clayton Road, Suite 610
 Concord, CA 94520-2142

Date Received: 04/04/19
 Work Order: 19-04-0344
 Preparation: N/A
 Method: EPA TO-3M
 Units: ug/m3

Project: 285830.02A.03

Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-15-709-42	N/A	Air	GC 13	N/A	04/04/19 11:07	190404L01

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
TPH as Gasoline	ND	930	1.00	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Quality Control - Sample Duplicate

TRC Solutions
2300 Clayton Road, Suite 610
Concord, CA 94520-2142

Date Received: 04/04/19
Work Order: 19-04-0344
Preparation: N/A
Method: EPA TO-3M

Project: 285830.02A.03

Page 1 of 1

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	Duplicate Batch Number
BR11-1 AA05	Sample	Air	GC 13	N/A	04/04/19 19:25	190404D01
BR11-1 AA05	Sample Duplicate	Air	GC 13	N/A	04/04/19 20:19	190404D01
<u>Parameter</u>		<u>Sample Conc.</u>	<u>DUP Conc.</u>	<u>RPD</u>	<u>RPD CL</u>	<u>Qualifiers</u>
TPH as Gasoline		4683	4082	14	0-20	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

TRC Solutions
2300 Clayton Road, Suite 610
Concord, CA 94520-2142

Date Received: 04/04/19
Work Order: 19-04-0344
Preparation: N/A
Method: ASTM D-1946

Project: 285830.02A.03

Page 1 of 5

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
099-16-444-949	LCS	Air	GC 65	N/A	04/04/19 10:04	190404L01			
099-16-444-949	LCSD	Air	GC 65	N/A	04/04/19 11:55	190404L01			
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Methane	4.530	4.301	95	4.251	94	80-120	1	0-30	
Carbon Dioxide	15.01	15.04	100	15.22	101	80-120	1	0-30	
Carbon Monoxide	7.020	6.801	97	6.709	96	80-120	1	0-30	
Oxygen (+ Argon)	3.990	4.105	103	4.188	105	80-120	2	0-30	
Nitrogen	69.45	64.84	93	64.37	93	80-120	1	0-30	


 Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

TRC Solutions
2300 Clayton Road, Suite 610
Concord, CA 94520-2142

Date Received: 04/04/19
Work Order: 19-04-0344
Preparation: N/A
Method: ASTM D-1946

Project: 285830.02A.03

Page 2 of 5

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
099-16-444-950	LCS	Air	GC 65	N/A	04/05/19 10:33	190405L01			
099-16-444-950	LCSD	Air	GC 65	N/A	04/05/19 13:01	190405L01			
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Methane	4.530	4.294	95	4.363	96	80-120	2	0-30	
Carbon Dioxide	15.01	14.99	100	15.56	104	80-120	4	0-30	
Carbon Monoxide	7.020	6.793	97	6.873	98	80-120	1	0-30	
Oxygen (+ Argon)	3.990	4.041	101	3.757	94	80-120	7	0-30	
Nitrogen	69.45	64.57	93	64.14	92	80-120	1	0-30	

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

TRC Solutions
2300 Clayton Road, Suite 610
Concord, CA 94520-2142

Date Received: 04/04/19
Work Order: 19-04-0344
Preparation: N/A
Method: EPA TO-15

Project: 285830.02A.03

Page 3 of 5

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
099-15-765-131	LCS	Air	GC/MS OOO	N/A	04/05/19 14:04	190405L02			
099-15-765-131	LCSD	Air	GC/MS OOO	N/A	04/05/19 14:51	190405L02			
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Benzene	79.87	87.60	110	87.87	110	60-156	0	0-40	
Toluene	94.21	100.5	107	101.3	107	56-146	1	0-43	
Ethylbenzene	108.6	115.6	106	116.7	108	52-154	1	0-38	
p/m-Xylene	217.1	223.4	103	225.5	104	42-156	1	0-41	
o-Xylene	108.6	109.9	101	111.0	102	52-148	1	0-38	
Naphthalene	131.1	129.3	99	129.6	99	40-190	0	0-30	


 Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS/LCSD

TRC Solutions
2300 Clayton Road, Suite 610
Concord, CA 94520-2142

Date Received: 04/04/19
Work Order: 19-04-0344
Preparation: N/A
Method: EPA TO-15 SIM

Project: 285830.02A.03

Page 4 of 5

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
099-15-775-62	LCS	Air	GC/MS YY	N/A	04/04/19 14:18	190404L02			
099-15-775-62	LCSD	Air	GC/MS YY	N/A	04/04/19 15:01	190404L02			
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Benzene	1.597	1.880	118	1.874	117	27-153	0	0-34	
Toluene	1.884	2.287	121	2.276	121	28-154	0	0-42	
Ethylbenzene	2.171	2.553	118	2.539	117	27-153	1	0-46	
p/m-Xylene	4.342	5.117	118	5.099	117	21-165	0	0-51	
o-Xylene	2.171	2.548	117	2.506	115	22-160	2	0-48	
Naphthalene	2.621	2.917	111	2.618	100	40-190	11	0-30	


 Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS

TRC Solutions
2300 Clayton Road, Suite 610
Concord, CA 94520-2142

Date Received: 04/04/19
Work Order: 19-04-0344
Preparation: N/A
Method: EPA TO-3M

Project: 285830.02A.03

Page 5 of 5

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-15-709-42	LCS	Air	GC 13	N/A	04/04/19 10:33	190404L01
<u>Parameter</u>		<u>Spike Added</u>	<u>Conc. Recovered</u>	<u>LCS %Rec.</u>	<u>%Rec. CL</u>	<u>Qualifiers</u>
TPH as Gasoline		932500	992700	106	80-120	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits

Summa Canister Vacuum Summary

Work Order: 19-04-0344

Page 1 of 1

Sample Name	Vacuum Out	Vacuum In	Equipment	Description
127BIA01	-29.50 in Hg	-2.60 in Hg	D836	Summa Canister 6L
127BIA02	-29.50 in Hg	-4.80 in Hg	D908	Summa Canister 6L
127BIA03	-29.50 in Hg	-3.80 in Hg	D175	Summa Canister 6L
127BIA04	-29.50 in Hg	-4.60 in Hg	D270	Summa Canister 6L
DUP04022019-01	-29.50 in Hg	-5.20 in Hg	D814	Summa Canister 6L
BR11-1 AA01	-29.50 in Hg	-3.00 in Hg	D383	Summa Canister 6L
BR11-1 AA03	-29.50 in Hg	-0.80 in Hg	D612	Summa Canister 6L
BR11-1 AA05	-29.50 in Hg	-7.00 in Hg	D638	Summa Canister 6L
127BSSV01	-29.50 in Hg	-2.20 in Hg	LC1031	Summa Canister 1L

Sample Analysis Summary Report

Work Order: 19-04-0344

Page 1 of 1

<u>Method</u>	<u>Extraction</u>	<u>Chemist ID</u>	<u>Instrument</u>	<u>Analytical Location</u>
ASTM D-1946	N/A	748	GC 65	2
ASTM D-1946	N/A	1144	GC 65	2
EPA TO-15	N/A	1087	GC/MS OOO	2
EPA TO-15 SIM	N/A	460	GC/MS YY	2
EPA TO-3M	N/A	1144	GC 13	2

Glossary of Terms and Qualifiers

Work Order: 19-04-0344

Page 1 of 1

<u>Qualifiers</u>	<u>Definition</u>
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
CI	See case narrative.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
ME	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.
	Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.
	A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.



Calscience

7440 Lincoln Way, Garden Grove, CA 92841-1427 • (714) 895-5494
For courier service / sample drop off information, contact us@eurofins.com or call us.

AIR CHAIN-OF-CUSTODY RECORD

DATE: 4/3/19
PAGE: 1 OF 1

LAB USE ONLY
19-04-0344

LABORATORY CLIENT: **TRC**

ADDRESS: **505 Sansome St. Suite 1600** STATE: **CA** ZIP: **94111**

CITY: **San Francisco**

TEL: **415-644-3003** E-MAIL: **aang@trccompanies.com**

TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD"):
 SAME DAY 24 HR 48 HR 72 HR 5 DAYS STANDARD

EDD: COELT EDF OTHER

SPECIAL INSTRUCTIONS: **Report to MDL TO-15 SIM**

CLIENT PROJECT NAME / NO.: **285830.02A.03**

PROJECT CONTACT: **Alfonso Ang**

PROJECT ADDRESS: **Riley Avenue**

CITY: **San Francisco** STATE: **CA** ZIP: **94129**

P.O. NO.: **118986**

LAB CONTACT OR QUOTE NO.:

SAMPLER(S): (PRINT) **Kevin Li, Jim Chidester**

REQUESTED ANALYSES

BTEX + Naphthalene TO-15

Methane, Fixed Gases D-1946

ASTM

TPH-g TO-3M LL

BTEX + Naphthalene TO-15

TRC

San Francisco CA 94129

**Please cc: Kli@trccompanies.com
jchidester@trccompanies.com**

LAB USE ONLY	SAMPLE ID	FIELD ID / POINT OF COLLECTION	MATRIX		SAMPLING EQUIPMENT			START SAMPLING INFORMATION			STOP SAMPLING INFORMATION				
			Indoor (I) Soil Vap. (SV) Ambient (A)	Indoor (I) Soil Vap. (SV) Ambient (A)	Media ID	Canister Size 8L or 1L	Flow Controller ID	Date	Time (24 hr clock)	Canister Pressure (in Hg)	Date	Time (24 hr clock)	Canister Pressure (in Hg)		
1	127BIA01		I	I	D836	6L	FC334	04/02/19	8:47	-30	04/03/19	9:51	-6	X	BTEX + Naphthalene TO-15
2	127BIA02		I	I	D908	6L	FC110		8:51			9:52	-7	X	
3	127BIA03		I	I	D175	6L	FC189		8:53			7:37	-5	X	
4	127BIA04		I	I	D270	6L	FC33		8:55			8:12	-5	X	
5	DUP04022019-01		I	I	D814	6L	FC313		8:48			9:51	-7	X	
6	BR11-AA01		A	A	D383	6L	FC253		8:30			7:42	-5	X	
7	BR11-AA03		A	A	D612	6L	FC105		8:36			7:30	-3	X	
8	BR11-AA05		A	A	D638	6L	FC168		8:40			9:50	-7	X	
9	127BSS01-KL	127BSSV01	SV	SV	LC1031	1L	SGM273	04/02/19	14:05	-30	04/02/19	14:10	-5	X	X

Relinquished by: (Signature) *[Signature]* Date: **4/3/19** Time: **1409**

Relinquished by: (Signature) *[Signature]* Date: **4/4/19** Time: **10:00**

Relinquished by: (Signature) *[Signature]* Date: _____ Time: _____

0344

1/3/2019



800-322-5555
www.gso.com

Ship From
CAL SCIENCE- CONCORD

Tracking #: 544329981

NPS

4/3/2019



800-322-5555
www.gso.com

Ship From
CAL SCIENCE- CONCORD
ALAN KEMP
5063 COMMERCIAL CIRCLE

Tracking #: 544329980

NPS



4/3/2019



800-322-5555
www.gso.com

Ship From
CAL SCIENCE- CONCORD
ALAN KEMP
5063 COMMERCIAL CIRCLE
#H
CONCORD, CA 94520

Tracking #: 544329983

NPS



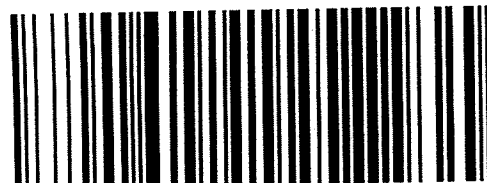
Ship To
CEL
SAMPLE RECEIVING
7440 LINCOLN WAY
GARDEN GROVE, CA 92841

ORC
GARDEN GROVE

C

COD: \$0.00
Weight: 0 lb(s)
Reference:
TRC
Delivery Instructions:

S92841A



Signature Type: STANDARD

636577

Print Date: 4/3/2019 2:25 PM

Package 3 of 3

LABEL INSTRUCTIONS:

Do not copy or reprint this label for additional shipments - each package must have a unique barcode.
Step 1: Use the "Print Label" button on this page to print the shipping label on a laser or inkjet printer.

SAMPLE RECEIPT CHECKLIST

COOLER 0 OF 0

CLIENT: TRC

DATE: 04/04/2019

TEMPERATURE: (Criteria: 0.0°C – 6.0°C, not frozen except sediment/tissue)

Thermometer ID: SC6 (CF: -0.2°C); Temperature (w/o CF): _____ °C (w/ CF): _____ °C; Blank Sample

Sample(s) outside temperature criteria (PM/APM contacted by: _____)

Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling

Sample(s) received at ambient temperature; placed on ice for transport by courier

Ambient Temperature: Air Filter

Checked by: 836

CUSTODY SEAL: BOX

Cooler Present and Intact Present but Not Intact Not Present N/A

Checked by: 836

Sample(s) Present and Intact Present but Not Intact Not Present N/A

Checked by: 1053

SAMPLE CONDITION:

Chain-of-Custody (COC) document(s) received with samples Yes No N/A

COC document(s) received complete Yes No N/A

Sampling date Sampling time Matrix Number of containers

No analysis requested Not relinquished No relinquished date No relinquished time

Sampler's name indicated on COC Yes No N/A

Sample container label(s) consistent with COC Yes No N/A

Sample container(s) intact and in good condition Yes No N/A

Proper containers for analyses requested Yes No N/A

Sufficient volume/mass for analyses requested Yes No N/A

Samples received within holding time Yes No N/A

Aqueous samples for certain analyses received within 15-minute holding time

pH Residual Chlorine Dissolved Sulfide Dissolved Oxygen Yes No N/A

Proper preservation chemical(s) noted on COC and/or sample container Yes No N/A

Unpreserved aqueous sample(s) received for certain analyses

Volatile Organics Total Metals Dissolved Metals

Acid/base preserved samples - pH within acceptable range Yes No N/A

Container(s) for certain analysis free of headspace..... Yes No N/A

Volatile Organics Dissolved Gases (RSK-175) Dissolved Oxygen (SM 4500)

Carbon Dioxide (SM 4500) Ferrous Iron (SM 3500) Hydrogen Sulfide (Hach)

Tedlar™ bag(s) free of condensation Yes No N/A

CONTAINER TYPE:

(Trip Blank Lot Number: _____)

Aqueous: VOA VOA_h VOA_{na2} 100PJ 100PJ_{na2} 125AGB 125AGB_h 125AGB_p 125PB 125PB_{z_{na}} (pH__9)

250AGB 250CGB 250CGB_s (pH__2) 250PB 250PB_n (pH__2) 500AGB 500AGJ 500AGJ_s (pH__2) 500PB

1AGB 1AGB_{na2} 1AGB_s (pH__2) 1AGB_s (O&G) 1PB 1PB_{na} (pH__12) _____ _____ _____

Solid: 4ozCGJ 8ozCGJ 16ozCGJ Sleeve (____) EnCores® (____) TerraCores® (____) _____ _____ _____

Air: Tedlar™ Canister Sorbent Tube PUF _____ Other Matrix (____): _____ _____ _____

Container: A = Amber, B = Bottle, C = Clear, E = Envelope, G = Glass, J = Jar, P = Plastic, and Z = Ziploc/Resealable Bag

Preservative: b = buffered, f = filtered, h = HCl, n = HNO₃, na = NaOH, na₂ = Na₂S₂O₃, p = H₃PO₄, Labeled/Checked by: 1053

s = H₂SO₄, u = ultra-pure, x = Na₂SO₃+NaHSO₄.H₂O, z_{na} = Zn (CH₃CO₂)₂ + NaOH Reviewed by: 836

SAMPLE ANOMALY REPORT

DATE: 04/1/2019

SAMPLES, CONTAINERS, AND LABELS:

- Sample(s) NOT RECEIVED but listed on COC
 - Sample(s) received but NOT LISTED on COC
 - Holding time expired (list client or ECI sample ID and analysis)
 - Insufficient sample amount for requested analysis (list analysis)
 - Improper container(s) used (list analysis)
 - Improper preservative used (list analysis)
 - pH outside acceptable range (list analysis)
 - No preservative noted on COC or label (list analysis and notify lab)
 - Sample container(s) not labeled
 - Client sample label(s) illegible (list container type and analysis)
 - Client sample label(s) do not match COC (comment)
 - Project information
 - Client sample ID
 - Sampling date and/or time
 - Number of container(s)
 - Requested analysis
 - Sample container(s) compromised (comment)
 - Broken
 - Water present in sample container
 - Air sample container(s) compromised (comment)
 - Flat
 - Very low in volume
 - Leaking (not transferred; duplicate bag submitted)
 - Leaking (transferred into ECI Tedlar™ bags*)
 - Leaking (transferred into client's Tedlar™ bags*)
- * Transferred at client's request.

Comments

(-9) labeled as
127 BSS 01
(Date / time match)

MISCELLANEOUS: (Describe)

Comments

HEADSPACE:

(Containers with bubble > 6 mm or ¼ inch for volatile organic or dissolved gas analysis)

ECI Sample ID	ECI Container ID	Total Number**	ECI Sample ID	ECI Container ID	Total Number**

(Containers with bubble for other analysis)

ECI Sample ID	ECI Container ID	Total Number**	Requested Analysis

Comments: _____

Reported by: 1053
 Reviewed by: 802

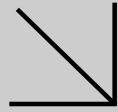
** Record the total number of containers (i.e., vials or bottles) for the affected sample.



Environmental
Calscience

Supplemental Report 2

Additional requested analyses are reported as a stand-alone report.



WORK ORDER NUMBER: 19-04-0344

The difference is service



AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: TRC Solutions

Client Project Name: 285830.02A.03

Attention: Alfonso Ang
2300 Clayton Road
Suite 610
Concord, CA 94520-2142

Approved for release on 04/19/2019 by:
Lori Thompson
Project Manager

ResultLink ▶

Email your PM ▶

Eurofins Calscience (Calscience) certifies that the test results provided in this report meet all NELAC Institute requirements for parameters for which accreditation is required or available. Any exceptions to NELAC Institute requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.



Contents

Client Project Name: 285830.02A.03
Work Order Number: 19-04-0344

1	Work Order Narrative.	3
2	Sample Summary.	4
3	Client Sample Data.	5
	3.1 EPA TO-3 (M) TPH Gasoline (Air).	5
4	Quality Control Sample Data.	6
	4.1 Sample Duplicate.	6
	4.2 LCS/LCSD.	7
5	Summa Canister Vacuum Summary.	8
6	Sample Analysis Summary.	9
7	Glossary of Terms and Qualifiers.	10
8	Chain-of-Custody/Sample Receipt Form.	11

Condition Upon Receipt:

Samples were received under Chain-of-Custody (COC) on 04/04/19. They were assigned to Work Order 19-04-0344.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

Holding Times:

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of ≤ 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

Quality Control:

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

Subcontractor Information:

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

Additional Comments:

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.



Calscience

Sample Summary

Client: TRC Solutions	Work Order:	19-04-0344
2300 Clayton Road, Suite 610	Project Name:	285830.02A.03
Concord, CA 94520-2142	PO Number:	118986
	Date/Time Received:	04/04/19 10:00
	Number of Containers:	9

Attn: Alfonso Ang

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
127BSSV01	19-04-0344-9	04/02/19 14:10	1	Air


Return to Contents



Calscience

Analytical Report

TRC Solutions
2300 Clayton Road, Suite 610
Concord, CA 94520-2142

Date Received: 04/04/19
Work Order: 19-04-0344
Preparation: N/A
Method: EPA TO-3M
Units: ug/m3

Project: 285830.02A.03

Page 1 of 1

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
127BSSV01	19-04-0344-9-A	04/02/19 14:10	Air	GC 13	N/A	04/16/19 13:14	190416L02

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
TPH as Gasoline	2000	930	1.00	

Method Blank	099-15-709-43	N/A	Air	GC 13	N/A	04/16/19 11:46	190416L02
--------------	---------------	-----	-----	-------	-----	-------------------	-----------

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
TPH as Gasoline	ND	930	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

Quality Control - Sample Duplicate

TRC Solutions
2300 Clayton Road, Suite 610
Concord, CA 94520-2142

Date Received: 04/04/19
Work Order: 19-04-0344
Preparation: N/A
Method: EPA TO-3M

Project: 285830.02A.03

Page 1 of 1

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	Duplicate Batch Number
127BSSV01	Sample	Air	GC 13	N/A	04/16/19 13:14	190416D02
127BSSV01	Sample Duplicate	Air	GC 13	N/A	04/16/19 13:43	190416D02

Parameter	Sample Conc.	DUP Conc.	RPD	RPD CL	Qualifiers
TPH as Gasoline	1951	1941	1	0-20	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

Quality Control - LCS

TRC Solutions
2300 Clayton Road, Suite 610
Concord, CA 94520-2142

Date Received: 04/04/19
Work Order: 19-04-0344
Preparation: N/A
Method: EPA TO-3M

Project: 285830.02A.03

Page 1 of 1

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
099-15-709-43	LCS	Air	GC 13	N/A	04/16/19 11:33	190416L02
<u>Parameter</u>		<u>Spike Added</u>	<u>Conc. Recovered</u>	<u>LCS %Rec.</u>	<u>%Rec. CL</u>	<u>Qualifiers</u>
TPH as Gasoline		932500	951200	102	80-120	



Return to Contents

RPD: Relative Percent Difference. CL: Control Limits

Summa Canister Vacuum Summary

Work Order: 19-04-0344

Page 1 of 1

Sample Name	Vacuum Out	Vacuum In	Equipment	Description
127BIA01	-29.50 in Hg	-2.60 in Hg	D836	Summa Canister 6L
127BIA02	-29.50 in Hg	-4.80 in Hg	D908	Summa Canister 6L
127BIA03	-29.50 in Hg	-3.80 in Hg	D175	Summa Canister 6L
127BIA04	-29.50 in Hg	-4.60 in Hg	D270	Summa Canister 6L
DUP04022019-01	-29.50 in Hg	-5.20 in Hg	D814	Summa Canister 6L
BR11-1 AA01	-29.50 in Hg	-3.00 in Hg	D383	Summa Canister 6L
BR11-1 AA03	-29.50 in Hg	-0.80 in Hg	D612	Summa Canister 6L
BR11-1 AA05	-29.50 in Hg	-7.00 in Hg	D638	Summa Canister 6L
127BSSV01	-29.50 in Hg	-2.20 in Hg	LC1031	Summa Canister 1L



Calscience

Sample Analysis Summary Report

Work Order: 19-04-0344

Page 1 of 1

<u>Method</u>	<u>Extraction</u>	<u>Chemist ID</u>	<u>Instrument</u>	<u>Analytical Location</u>
EPA TO-3M	N/A	1144	GC 13	2


Return to Contents

Location 2: 7445 Lampson Avenue, Garden Grove, CA 92841

Glossary of Terms and Qualifiers

Work Order: 19-04-0344

Page 1 of 1

<u>Qualifiers</u>	<u>Definition</u>
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
CI	See case narrative.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
ME	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.
	Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.
	A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.



Calscience

7440 Lincoln Way, Garden Grove, CA 92841-1427 • (714) 895-5494
For courier service / sample drop off information, contact us@eurofins.com or call us.

AIR CHAIN-OF-CUSTODY RECORD

DATE: 4/3/19
PAGE: 1 OF 1

LAB USE ONLY
19-04-0344

LABORATORY CLIENT: TRC

ADDRESS: 505 Sansome St. Suite 1600
CITY: San Francisco STATE: CA ZIP: 94111

TEL: 415-644-3003 E-MAIL: aang@trccompanies.com
TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD"):
 SAME DAY 24 HR 48 HR 72 HR 5 DAYS STANDARD

UNIT: COELT EDF OTHER

SPECIAL INSTRUCTIONS:
Report to MDL TO-15 SIM

Please cc: Kli@trccompanies.com
jchidester@trccompanies.com

CLIENT PROJECT NAME / NO.: 285830.02A.03

PROJECT CONTACT: Alfonso Ang

PROJECT ADDRESS: Riley Avenue

CITY: San Francisco STATE: CA ZIP: 94129

P.O. NO.: 118986

LAB CONTACT OR QUOTE NO.:

SAMPLER(S): (PRINT)
Kevin Li, Jim Chidester

REQUESTED ANALYSES
BTEX+Naphthalene TO-15
Methane, Fixed Gases D-1946
ASTM
TPH-g TO-3M LL

LAB USE ONLY	SAMPLE ID	FIELD ID / POINT OF COLLECTION	MATRIX			SAMPLING EQUIPMENT			START SAMPLING INFORMATION			STOP SAMPLING INFORMATION				
			Indoor (I) Soil Vap. (SV) Ambient (A)	Media ID	Canister Size 8L or 1L	Flow Controller ID	Date	Time (24-hr clock)	Canister Pressure (in Hg)	Date	Time (24-hr clock)	Canister Pressure (in Hg)				
1	127BIA01		I	D836	6L	FC334	04/02/19	8:47	04/03/19	9:51	-30	04/03/19	9:51	-6	X	BTEX+Naphthalene TO-15
2	127BIA02		I	D908	6L	FC110		8:51		9:52			9:52	-7	X	
3	127BIA03		I	D175	6L	FC189		8:53		7:37			7:37	-5	X	
4	127BIA04		I	D270	6L	FC33		8:55		8:12			8:12	-5	X	
5	DUP04022019-01		I	D814	6L	FC313		8:48		9:51			9:51	-7	X	
6	BR11-AA01		A	D383	6L	FC253		8:30		7:42			7:42	-5	X	
7	BR11-AA03		A	D612	6L	FC105		8:36		7:30			7:30	-3	X	
8	BR11-AA05		A	D638	6L	FC168		8:40		9:50			9:50	-7	X	
9	127BSS01-KL	127BSSV01	SV	LC1031	1L	SGM273	04/02/19	14:05	04/02/19	14:10	-30	04/02/19	14:10	-5	X	

Relinquished by: (Signature) Date: 4/3/19 Time: 1409

Relinquished by: (Signature) Date: 4/4/19 Time: 10:00

Relinquished by: (Signature) Date: Time:

(GSO)

0344

1/3/2019



800-322-5555
www.gso.com

Ship From
CAL SCIENCE- CONCORD

Tracking #: 544329981

NPS

4/3/2019



800-322-5555
www.gso.com

Ship From
CAL SCIENCE- CONCORD
ALAN KEMP
5063 COMMERCIAL CIRCLE

Tracking #: 544329980

NPS



4/3/2019



800-322-5555
www.gso.com

Ship From
CAL SCIENCE- CONCORD
ALAN KEMP
5063 COMMERCIAL CIRCLE
#H
CONCORD, CA 94520

Tracking #: 544329983

NPS



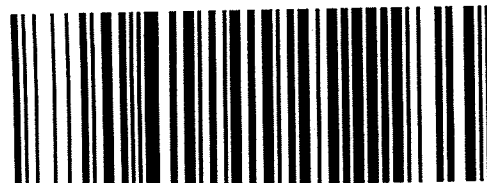
Ship To
CEL
SAMPLE RECEIVING
7440 LINCOLN WAY
GARDEN GROVE, CA 92841

ORC
GARDEN GROVE

C

COD: \$0.00
Weight: 0 lb(s)
Reference:
TRC
Delivery Instructions:

S92841A



Signature Type: STANDARD

636577

Print Date: 4/3/2019 2:25 PM

Package 3 of 3

LABEL INSTRUCTIONS:

Do not copy or reprint this label for additional shipments - each package must have a unique barcode.
Step 1: Use the "Print Label" button on this page to print the shipping label on a laser or inkjet printer.

SAMPLE RECEIPT CHECKLIST

COOLER 0 OF 0

CLIENT: TRC

DATE: 04/04/2019

TEMPERATURE: (Criteria: 0.0°C – 6.0°C, not frozen except sediment/tissue)

Thermometer ID: SC6 (CF: -0.2°C); Temperature (w/o CF): _____ °C (w/ CF): _____ °C; Blank Sample

Sample(s) outside temperature criteria (PM/APM contacted by: _____)

Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling

Sample(s) received at ambient temperature; placed on ice for transport by courier

Ambient Temperature: Air Filter

Checked by: 836

CUSTODY SEAL: BOX

Cooler Present and Intact Present but Not Intact Not Present N/A

Checked by: 836

Sample(s) Present and Intact Present but Not Intact Not Present N/A

Checked by: 1053

SAMPLE CONDITION:

	Yes	No	N/A
Chain-of-Custody (COC) document(s) received with samples	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COC document(s) received complete	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Sampling date <input type="checkbox"/> Sampling time <input type="checkbox"/> Matrix <input type="checkbox"/> Number of containers			
<input type="checkbox"/> No analysis requested <input type="checkbox"/> Not relinquished <input type="checkbox"/> No relinquished date <input type="checkbox"/> No relinquished time			
Sampler's name indicated on COC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container label(s) consistent with COC	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Sample container(s) intact and in good condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proper containers for analyses requested	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sufficient volume/mass for analyses requested	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Samples received within holding time	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aqueous samples for certain analyses received within 15-minute holding time			
<input type="checkbox"/> pH <input type="checkbox"/> Residual Chlorine <input type="checkbox"/> Dissolved Sulfide <input type="checkbox"/> Dissolved Oxygen	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Proper preservation chemical(s) noted on COC and/or sample container	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Unpreserved aqueous sample(s) received for certain analyses			
<input type="checkbox"/> Volatile Organics <input type="checkbox"/> Total Metals <input type="checkbox"/> Dissolved Metals			
Acid/base preserved samples - pH within acceptable range	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Container(s) for certain analysis free of headspace.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> Volatile Organics <input type="checkbox"/> Dissolved Gases (RSK-175) <input type="checkbox"/> Dissolved Oxygen (SM 4500)			
<input type="checkbox"/> Carbon Dioxide (SM 4500) <input type="checkbox"/> Ferrous Iron (SM 3500) <input type="checkbox"/> Hydrogen Sulfide (Hach)			
Tedlar™ bag(s) free of condensation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CONTAINER TYPE:

(Trip Blank Lot Number: _____)

Aqueous: VOA VOA_h VOA_{na2} 100PJ 100PJ_{na2} 125AGB 125AGB_h 125AGB_p 125PB 125PB_{z_{na}} (pH__9)
 250AGB 250CGB 250CGB_s (pH__2) 250PB 250PB_n (pH__2) 500AGB 500AGJ 500AGJ_s (pH__2) 500PB
 1AGB 1AGB_{na2} 1AGB_s (pH__2) 1AGB_s (O&G) 1PB 1PB_{na} (pH__12) _____ _____ _____

Solid: 4ozCGJ 8ozCGJ 16ozCGJ Sleeve (____) EnCores® (____) TerraCores® (____) _____ _____ _____

Air: Tedlar™ Canister Sorbent Tube PUF _____ **Other Matrix** (____): _____ _____ _____

Container: **A** = Amber, **B** = Bottle, **C** = Clear, **E** = Envelope, **G** = Glass, **J** = Jar, **P** = Plastic, and **Z** = Ziploc/Resealable Bag

Preservative: **b** = buffered, **f** = filtered, **h** = HCl, **n** = HNO₃, **na** = NaOH, **na₂** = Na₂S₂O₃, **p** = H₃PO₄, Labeled/Checked by: 1053

s = H₂SO₄, **u** = ultra-pure, **x** = Na₂SO₃+NaHSO₄.H₂O, **z_{na}** = Zn (CH₃CO₂)₂ + NaOH Reviewed by: 836

SAMPLE ANOMALY REPORT

DATE: 04/1/2019

SAMPLES, CONTAINERS, AND LABELS:

- Sample(s) NOT RECEIVED but listed on COC
 - Sample(s) received but NOT LISTED on COC
 - Holding time expired (list client or ECI sample ID and analysis)
 - Insufficient sample amount for requested analysis (list analysis)
 - Improper container(s) used (list analysis)
 - Improper preservative used (list analysis)
 - pH outside acceptable range (list analysis)
 - No preservative noted on COC or label (list analysis and notify lab)
 - Sample container(s) not labeled
 - Client sample label(s) illegible (list container type and analysis)
 - Client sample label(s) do not match COC (comment)
 - Project information
 - Client sample ID
 - Sampling date and/or time
 - Number of container(s)
 - Requested analysis
 - Sample container(s) compromised (comment)
 - Broken
 - Water present in sample container
 - Air sample container(s) compromised (comment)
 - Flat
 - Very low in volume
 - Leaking (not transferred; duplicate bag submitted)
 - Leaking (transferred into ECI Tedlar™ bags*)
 - Leaking (transferred into client's Tedlar™ bags*)
- * Transferred at client's request.

Comments

(-9) labeled as
127 BSS 01
(Date / time match)

MISCELLANEOUS: (Describe)

Comments

HEADSPACE:

(Containers with bubble > 6 mm or ¼ inch for volatile organic or dissolved gas analysis)

ECI Sample ID	ECI Container ID	Total Number**	ECI Sample ID	ECI Container ID	Total Number**

(Containers with bubble for other analysis)

ECI Sample ID	ECI Container ID	Total Number**	Requested Analysis

Comments: _____

Reported by: 1053
 Reviewed by: 802

** Record the total number of containers (i.e., vials or bottles) for the affected sample.

4/17/2019

Mr. Alfonso Ang

TRC Companies, Inc.

505 Sansome St.

San Francisco CA 94111

Project Name: Riley Avenue

Project #: 285830.02A.03

Workorder #: 1904092

Dear Mr. Alfonso Ang

The following report includes the data for the above referenced project for sample(s) received on 4/4/2019 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-17 VI 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 Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. 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

WORK ORDER #: 1904092

Work Order Summary

CLIENT:	Mr. Alfonso Ang TRC Companies, Inc. 505 Sansome St. San Francisco, CA 94111	BILL TO:	Accounts Payable/Windsor TRC Companies, Inc. 21 Griffin Rd North Windsor, CT 06095
PHONE:	415.644.3000	P.O. #	118983
FAX:	415.541.9378	PROJECT #	285830.02A.03 Riley Avenue
DATE RECEIVED:	04/04/2019	CONTACT:	Kelly Buettner
DATE COMPLETED:	04/17/2019		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>
01A	127BIA01	Modified TO-17 VI
02A	127BIA02	Modified TO-17 VI
03A	127BIA03	Modified TO-17 VI
04A	127BIA04	Modified TO-17 VI
05A	DUP04022019-01	Modified TO-17 VI
06A	BR11-1AA01	Modified TO-17 VI
07A	BR11-1AA03	Modified TO-17 VI
08A	BR11-1AA05	Modified TO-17 VI
09A	FB04022019-1	Modified TO-17 VI
10A	FB04022019-2	Modified TO-17 VI
11A	127BSSV01	Modified TO-17 VI
12A	Lab Blank	Modified TO-17 VI
13A	CCV	Modified TO-17 VI
14A	LCS	Modified TO-17 VI
14AA	LCSD	Modified TO-17 VI

CERTIFIED BY: 
 Technical Director

DATE: 04/17/19

Certification numbers: AZ Licensure AZ0775, FL NELAP - E8 , LA NELAP - 02089, NH NELAP - 209218, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-18-13, UT NELAP CA009332018-10, VA NELAP - 9505, WA NELAP - C935

Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
 Accreditation number: CA300005-011, Effective date: 10/18/2018, Expiration date: 10/17/2019.

Eurofins Air Toxics LLC. certifies that the test results contained in this report meet all requirements of the NELAC standards

This report shall not be reproduced, except in full, without the written approval of Eurofins Air Toxics LLC.

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
 (916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified EPA Method TO-17 (VI Tubes)
TRC Companies, Inc.
Workorder# 1904092

Eleven TO-17 VI Tube samples were received on April 04, 2019. The laboratory performed the analysis via modified EPA Method TO-17 using GC/MS in the full scan mode. TO-17 'VI' sorbent tubes are thermally desorbed onto a secondary trap. The trap is thermally desorbed to elute the components into the GC/MS system for compound separation and detection.

At the client's request, a modification may be applied to EPA Method TO-17 to transport sorbent tubes above the 4 deg C temperature threshold. Laboratory studies demonstrate a high level of stability for VOCs on the TO-17 'VI' tube at room temperature for periods of up to 14 days. Tubes can be shipped to and from the field site at ambient conditions as long as the 14-day sample hold time is upheld. Trip blanks and field surrogate spikes are used as additional control measures to monitor recovery and background contribution during tube transport.

Since the TO-17 VI application significantly extends the scope of target compounds addressed in TO-17, the laboratory has implemented a method modification outlined in the table below. Specific project requirements may over-ride the laboratory modification.

<i>Requirement</i>	<i>TO-17</i>	<i>ATL Modifications</i>
Distributed Volume Pairs	Collection of distributed volume pairs required for monitoring ambient air to insure high quality.	If site is well-characterized or performance previously verified, single tube sampling may be appropriate. Distributed pairs may be impractical for soil gas collection due to configuration and volume constraints.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

A sampling volume of 11.1 L was used to convert ng to ug/m³ for the associated Lab Blank and samples FB04022019-1 and FB04022019-2.

The reported CCV and LCS for each daily batch may be derived from more than one analytical file.

Definition of Data Qualifying Flags

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

B - Compound present in blank (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

Summary of Detected Compounds EPA METHOD TO-17

Client Sample ID: 127BIA01

Lab ID#: 1904092-01A

No Detections Were Found.

Client Sample ID: 127BIA02

Lab ID#: 1904092-02A

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
TPH (Diesel Range C10-C22)	1000	91	1400	130

Client Sample ID: 127BIA03

Lab ID#: 1904092-03A

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
TPH (Diesel Range C10-C22)	1000	92	1600	150

Client Sample ID: 127BIA04

Lab ID#: 1904092-04A

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
TPH (Diesel Range C10-C22)	1000	91	2000	180

Client Sample ID: DUP04022019-01

Lab ID#: 1904092-05A

No Detections Were Found.

Client Sample ID: BR11-1AA01

Lab ID#: 1904092-06A

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
TPH (Gasoline Range)	1000	90	3600	320
TPH (Diesel Range C10-C22)	1000	90	3800	340

Client Sample ID: BR11-1AA03

Lab ID#: 1904092-07A

Summary of Detected Compounds EPA METHOD TO-17

Client Sample ID: BR11-1AA03

Lab ID#: 1904092-07A

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
TPH (Gasoline Range)	1000	90	2900	260
TPH (Diesel Range C10-C22)	1000	90	3400	310

Client Sample ID: BR11-1AA05

Lab ID#: 1904092-08A

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
TPH (Gasoline Range)	1000	92	3300	300
TPH (Diesel Range C10-C22)	1000	92	3500	320

Client Sample ID: FB04022019-1

Lab ID#: 1904092-09A

No Detections Were Found.

Client Sample ID: FB04022019-2

Lab ID#: 1904092-10A

No Detections Were Found.

Client Sample ID: 127BSSV01

Lab ID#: 1904092-11A

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
TPH (Diesel Range C10-C22)	1000	6700	1500	10000



Air Toxics

Client Sample ID: 127BIA01

Lab ID#: 1904092-01A

EPA METHOD TO-17

File Name:	11041010	Date of Extraction: NA	Date of Collection: 4/2/19 3:34:00 PM
Dil. Factor:	1.00	Date of Analysis: 4/10/19 05:42 PM	

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
TPH (Gasoline Range)	1000	92	Not Detected	Not Detected
TPH (Diesel Range C10-C22)	1000	92	Not Detected	Not Detected

Air Sample Volume(L): 10.8
Container Type: TO-17 VI Tube



Air Toxics

Client Sample ID: 127BIA02

Lab ID#: 1904092-02A

EPA METHOD TO-17

File Name:	11041011	Date of Extraction: NA	Date of Collection: 4/2/19 2:42:00 PM
Dil. Factor:	1.00	Date of Analysis: 4/10/19 06:24 PM	

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
TPH (Gasoline Range)	1000	91	Not Detected	Not Detected
TPH (Diesel Range C10-C22)	1000	91	1400	130

Air Sample Volume(L): 11.0
Container Type: TO-17 VI Tube



Air Toxics

Client Sample ID: 127BIA03

Lab ID#: 1904092-03A

EPA METHOD TO-17

File Name:	11041012	Date of Extraction: NA	Date of Collection: 4/2/19 2:39:00 PM
Dil. Factor:	1.00	Date of Analysis: 4/10/19 07:06 PM	

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
TPH (Gasoline Range)	1000	92	Not Detected	Not Detected
TPH (Diesel Range C10-C22)	1000	92	1600	150

Air Sample Volume(L): 10.9
Container Type: TO-17 VI Tube



Air Toxics

Client Sample ID: 127BIA04

Lab ID#: 1904092-04A

EPA METHOD TO-17

File Name:	11041013	Date of Extraction: NA	Date of Collection: 4/2/19 2:35:00 PM
Dil. Factor:	1.00	Date of Analysis: 4/10/19 07:47 PM	

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
TPH (Gasoline Range)	1000	91	Not Detected	Not Detected
TPH (Diesel Range C10-C22)	1000	91	2000	180

Air Sample Volume(L): 11.0
Container Type: TO-17 VI Tube



Air Toxics

Client Sample ID: DUP04022019-01

Lab ID#: 1904092-05A

EPA METHOD TO-17

File Name:	11041014	Date of Extraction: NA	Date of Collection: 4/2/19 4:15:00 PM
Dil. Factor:	1.00	Date of Analysis: 4/10/19 08:29 PM	

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
TPH (Gasoline Range)	1000	96	Not Detected	Not Detected
TPH (Diesel Range C10-C22)	1000	96	Not Detected	Not Detected

Air Sample Volume(L): 10.4
Container Type: TO-17 VI Tube



Air Toxics

Client Sample ID: BR11-1AA01

Lab ID#: 1904092-06A

EPA METHOD TO-17

File Name:	11041015	Date of Extraction: NA	Date of Collection: 4/2/19 3:42:00 PM
Dil. Factor:	1.00	Date of Analysis: 4/10/19 09:12 PM	

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
TPH (Gasoline Range)	1000	90	3600	320
TPH (Diesel Range C10-C22)	1000	90	3800	340

Air Sample Volume(L): 11.1
Container Type: TO-17 VI Tube



Air Toxics

Client Sample ID: BR11-1AA03

Lab ID#: 1904092-07A

EPA METHOD TO-17

File Name:	11041016	Date of Extraction: NA	Date of Collection: 4/2/19 3:48:00 PM
Dil. Factor:	1.00	Date of Analysis: 4/10/19 09:54 PM	

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
TPH (Gasoline Range)	1000	90	2900	260
TPH (Diesel Range C10-C22)	1000	90	3400	310

Air Sample Volume(L): 11.1
Container Type: TO-17 VI Tube



Air Toxics

Client Sample ID: BR11-1AA05

Lab ID#: 1904092-08A

EPA METHOD TO-17

File Name:	11041017	Date of Extraction:	NA	Date of Collection:	4/2/19 3:28:00 PM
Dil. Factor:	1.00			Date of Analysis:	4/10/19 10:36 PM

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
TPH (Gasoline Range)	1000	92	3300	300
TPH (Diesel Range C10-C22)	1000	92	3500	320

Air Sample Volume(L): 10.9
Container Type: TO-17 VI Tube



Air Toxics

Client Sample ID: FB04022019-1

Lab ID#: 1904092-09A

EPA METHOD TO-17

File Name:	11041007	Date of Extraction:	NA	Date of Collection:	4/2/19 9:01:00 AM
Dil. Factor:	1.00			Date of Analysis:	4/10/19 03:36 PM

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
TPH (Gasoline Range)	1000	90	Not Detected	Not Detected
TPH (Diesel Range C10-C22)	1000	90	Not Detected	Not Detected

Air Sample Volume(L): 11.1
Container Type: TO-17 VI Tube



Air Toxics

Client Sample ID: FB04022019-2

Lab ID#: 1904092-10A

EPA METHOD TO-17

File Name:	11041008	Date of Extraction: NA	Date of Collection: 4/2/19 9:04:00 AM
Dil. Factor:	1.00	Date of Analysis: 4/10/19 04:18 PM	

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
TPH (Gasoline Range)	1000	90	Not Detected	Not Detected
TPH (Diesel Range C10-C22)	1000	90	Not Detected	Not Detected

Air Sample Volume(L): 11.1
Container Type: TO-17 VI Tube



Air Toxics

Client Sample ID: 127BSSV01

Lab ID#: 1904092-11A

EPA METHOD TO-17

File Name:	11041009	Date of Extraction: NA	Date of Collection: 4/2/19 2:14:00 PM
Dil. Factor:	1.00	Date of Analysis: 4/10/19 05:00 PM	

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
TPH (Gasoline Range)	1000	6700	Not Detected	Not Detected
TPH (Diesel Range C10-C22)	1000	6700	1500	10000

Air Sample Volume(L): 0.150
Container Type: TO-17 VI Tube



Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 1904092-12A

EPA METHOD TO-17

File Name:	11041006	Date of Extraction: NA	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 4/10/19 02:21 PM	

Compound	Rpt. Limit (ng)	Rpt. Limit (ug/m3)	Amount (ng)	Amount (ug/m3)
TPH (Gasoline Range)	1000	90	Not Detected	Not Detected
TPH (Diesel Range C10-C22)	1000	90	Not Detected	Not Detected

Air Sample Volume(L): 11.1
Container Type: NA - Not Applicable



Air Toxics

Client Sample ID: CCV

Lab ID#: 1904092-13A

EPA METHOD TO-17

File Name:	11041002	Date of Extraction: NA	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 4/10/19 11:33 AM	

Compound	%Recovery
TPH (Gasoline Range)	105
TPH (Diesel Range C10-C22)	105

Air Sample Volume(L): 1.00
Container Type: NA - Not Applicable



Air Toxics

Client Sample ID: LCS

Lab ID#: 1904092-14A

EPA METHOD TO-17

File Name:	11041003	Date of Extraction: NA	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 4/10/19 12:15 PM	

Compound	%Recovery	Method Limits
TPH (Gasoline Range)	104	60-140
TPH (Diesel Range C10-C22)	Not Spiked	60-140

Air Sample Volume(L): 1.00

Container Type: NA - Not Applicable



Air Toxics

Client Sample ID: LCSD

Lab ID#: 1904092-14AA

EPA METHOD TO-17

File Name:	11041004	Date of Extraction: NA	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 4/10/19 12:57 PM	

Compound	%Recovery	Method Limits
TPH (Gasoline Range)	90	60-140
TPH (Diesel Range C10-C22)	Not Spiked	60-140

Air Sample Volume(L): 1.00

Container Type: NA - Not Applicable