November 9, 2015

Jerry Wickham PG, CHG
Alameda County Department of Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502-6540

Subject: Baseline Vapor and Air Monitoring Report for Building 300 for the Former Pacific Electric Motors Site 1009 66th Avenue, Oakland, California (Fuel Leak Case Number RO0000411)

Dear Mr. Wickham:

Enclosed is the Baseline Vapor and Air Monitoring Report for Building 300 for the Former Pacific Electric Motors Site 1009 66th Avenue, Oakland, California; Alameda County Environmental Health (ACEH) Fuel Leak Case Number RO0000411 ("the Site"). This report was prepared to present the results and evaluation of the vapor in pipe risers and indoor air samples collected on September 14, 2015 following construction of the gymnasium building (also referred to as Building 300).

I certify under penalty of law that this document and all attachments are prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have any questions or comments, please call Ms. Erica Kalve of ARCADIS at (415) 491-4530 extension 22, or me at (510) 434-5507.

Sincerely,

Delphine Sherman
Chief Financial Officer
Aspire Public Schools

Enclosure

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College for Certain, LLC

Baseline Vapor and Air Monitoring Report for Building 300

Former Pacific Electric Motors Site
1009 66th Avenue
Oakland, California
(Fuel Leak Case Number RO0000411)

November 9, 2015

ARCADIS

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Baseline Vapor and Air Monitoring Report for Building 300

Former Pacific Electric Motors Site, 1009 66th Avenue, Oakland, California
(Fuel Leak Case Number RO0000411)

Prepared for:
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Our Ref.:
EM009155.0017

Date:
November 9, 2015

Table of Contents

Appendices

Acronyms and Abbreviations

µg/m^3	micrograms per cubic meter
ACEH	Alameda County Department of Environmental Health
ACT	Advanced Construction Technologies
Arcadis	Arcadis U.S., Inc.
BTEX	benzene, toluene, ethylbenzene, and xylenes
CAP	Corrective Action Plan
CFC	College for Certain, LLC
COPC	constituent of potential concern
DTSC	Department of Toxic Substances Control
HHRA	Human Health Risk Assessment
HVAC	heating, ventilation, and air conditioning
MTBE	methyl tertiary-butyl ether
PCBs	polychlorinated biphenyls
PEM	former Pacific Electric Motors
RSL	Regional Screening Level
Site	former Pacific Electric Motors (PEM) facility located at 1009 66th Avenue in Oakland, California
SVE/AS	soil-vapor extraction/air sparging
TBA	tertiary-butyl alcohol
TPHg	total petroleum hydrocarbons as gasoline
TSCA	Toxic Substance Control Act
USEPA	United States Environmental Protection Agency
VIM	Vapor Intrusion Mitigation
VOC	volatile organic compound

Certification

All hydrogeologic and geologic information, conclusions, and recommendations in this document have been prepared under the supervision of and reviewed by an Arcadis U.S., Inc., California Professional Geologist.

Erica Kalve, P.G. (8425) Expires Sept. 30, 2017 November 9, 2015 Date

Senior Geologist

California Professional Geologist (8245)

*A professional geologist's certification of conditions comprises a declaration of his or her professional judgment. It does not constitute a warranty or a guarantee, expressed or implied, not does it relieve any other party of its responsibility to abide by contract documents, applicable codes, standards, regulations, and ordinances.

1. Introduction

Arcadis U.S., Inc. (Arcadis) has prepared this Baseline Vapor and Air Monitoring Report for Building 300 on behalf of College for Certain, LLC (CFC) for the former Pacific Electric Motors (PEM) facility located at 1009 66th Avenue in Oakland, California ("the Site"; Figure 1). Alameda County Department of Environmental Health (ACEH) provided conditional approval of the Vapor Intrusion Mitigation (VIM) system design for the proposed gymnasium building (Arcadis 2014c) in a letter dated January 8, 2015 (ACEH 2015). As stated in the conditional approval letter, a determination on the adequacy of the VIM system to mitigate potential vapor intrusion will be based upon vapor and indoor air monitoring data collected after installation of the system.

This report presents the results and evaluation of the vapor in pipe risers and indoor air samples collected on September 14, 2015 following construction of the gymnasium building (also referred to as Building 300). The vapor and indoor air samples were collected in accordance with the Building 300 Vapor and Indoor Air Monitoring Plan (Air Monitoring Plan; Arcadis 2015a) and follow applicable guidance per the Department of Toxic Substances Control (DTSC) Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (the DTSC Vapor Intrusion Guidance Document; DTSC 2011) to establish baseline conditions in Building 300 following construction of the VIM system.

2. Site Description and History

2.1 Background

The Site is 2.51 acres and is located on the northwestern side of 66th Avenue between East 14th Street and San Leandro Street (Figure 1). The area around the Site is developed with a mixture of commercial, industrial, government, and multi-family residential buildings. The Site is currently owned by CFC.

The first industrial development of the property was in about 1948 when the two buildings were constructed for the former PEM facility. PEM occupied the Site from 1948 to 2001. Activities that PEM conducted at the Site included manufacturing specialty magnets, power supplies, and components, and repairing motors, generators, transformers, and magnets. PEM reportedly installed a 2,000-gallon gasoline underground storage tank (UST) at the Site in 1975. In addition, the gasoline shed in the fueling area may have stored vehicle lubricants and oil for vehicle maintenance.

The structures that were on the property were demolished between November 2009 and February 2010. The Site has been redeveloped into the Aspire Golden State College Preparatory Academy, which serves grades 6 through 12 and has capacity for 570 students. The school opened in August 2011 (Figure 2). The school occupies approximately 1.4 acres and consists of the following site features:

- Six two-story buildings (approximately 41,430 square feet total, including 24 full-sized classrooms, four laboratories, three girls' and three boys' restrooms, and four staff restrooms)
- An asphalt-paved parking area with access via two driveways on 66th Avenue (one for ingress and one for egress)
- An asphalt-paved area for recreation
- Asphalt-paved and concrete pedestrian walkways
- Planter and landscaped areas.

As part of the redevelopment of the Site, the ground surface comprised of roadways, sidewalks, parking areas, buildings, and planter areas is serving as a cap to mitigate potential exposure to remaining polychlorinated biphenyls (PCBs) containing soil at the Site. Additionally, a new building is currently being constructed and a VIM system was installed on April 7 and 8, 2015 by Advanced Construction Technologies (ACT).

2.2 Environmental Site History

The Revised Corrective Action Plan (Revised CAP) summarized the results of previous investigations, presented the site conceptual model, quantified the baseline human health risk with assumed exposures to the chemicals of potential concerns (COPCs), developed site-specific risk-based cleanup goals, evaluated potential remedies, and presented an implementation plan for the selected remedies (Arcadis 2009a). The Revised CAP was approved by the ACEH in its letter to Aspire Charter Schools dated August 13, 2009 (ACEH 2009).

Several remedial actions implemented in accordance with the Revised CAP included:

- Soil excavation and removal of approximately 8,662 tons of soil containing elevated concentrations of lead, arsenic, PCBs, benzene, and total petroleum hydrocarbons as gasoline (TPHg) (Arcadis 2014a).

- Air injection and soil-vapor extraction (SVE) to reduce concentrations of TPHg, benzene, toluene, ethylbenzene, and xylenes (BTEX compounds), tertiary-butyl alcohol (TBA), and methyl tertiary-butyl ether (MTBE) in groundwater, soil, and soil gas. Two phases of soil-vapor extraction/air sparging (SVE/AS) were implemented and an estimated 798 pounds of fuel vapors were recovered from the Site (Arcadis 2014a).
- Areas of PCB-containing soil (and building materials) were remediated in accordance with the Revised CAP and Self-Implementing Cleanup Plan (Arcadis 2009a, 2009b).

The implementation of the Revised CAP was reported to ACEH (and the United States Environmental Protection Agency [USEPA]) in the Soil Removal Action Completion Report, dated September 15, 2010 (Arcadis 2010b). Removal of soil and building materials affected by PCBs was documented in a letter report that was prepared in accordance with the Toxic Substance Control Act (TSCA) and transmitted to USEPA on August 13, 2010 ("the TSCA Report"; Arcadis 2010a).

As documented in the Groundwater Monitoring Report (Arcadis 2014a), the analytical results for groundwater samples collected at the Site indicate that concentrations of TPHg, BTEX, and MTBE have decreased over time and remain low. This decreasing trend in concentrations is likely the direct result of the excavation and off-site disposal of fuel-affected soil that took place at the Site in 1995, 2002, and 2010, and the operation of the SVE/AS system. Additionally, the development plan for the property included the construction of buildings with a raised foundation approximately 18 inches above the ground to create a vented "crawl space" and a passive system to further reduce the potential for soil vapors to intrude to the existing on-site buildings.

3. Vapor Mitigation System Installation

The vapor-tight membrane barrier was installed on April 7 and 8, 2015 by ACT. The VIM system comprises the Vapor-Vent™ Soil Gas Collection system and vapor-tight membrane (Geo-Seal™).

Inspection of the VIM system was conducted by Arcadis. The installation was performed in accordance with the Design Drawings (with minor field changes reflected in the drawings included on Figures A-1 and A-2) and in accordance with the Land Science Technologies Geo-Seal™ Advanced Vapor Management Technology Inspector Training Manual. A letter documenting the Geo-Seal™ installation (inspection report) was provided to Aspire on April 13, 2015 and was subsequently

submitted to the City of Oakland Planning and Building Department. A copy of the inspection report is included as Appendix A (Arcadis 2015b).

The remaining components of the system were installed according to the construction schedule, and visual inspections were made at specific stages of the installation process. Specifically, the concrete slab on grade foundation installation was conducted on April 17, 2015, and visual inspections were conducted to confirm that the terminations to the slab on grade foundation were completely sealed. The vapor vent risers were installed during the rough plumbing stage, and site visits were conducted to discuss necessary details regarding the pipe route and sample collection features. Finally, the rotary wind turbine was installed at the termination of the vapor vent riser pipe and above the roofline in early September and was visually inspected during the confirmation sampling event conducted on September 14, 2015. The observations gathered during the various inspections provide confirmation that the vapor mitigation system was properly installed.

4. Field Sampling

To evaluate the effectiveness of the VIM system, three grab vapor samples (R-1, R-2, and R-3) and six indoor air samples (IA-01 through IA-06) were collected as baseline measurements. Samples were collected on September 14, 2015 in accordance with the Indoor Air Monitoring Plan. Following sample collection, the vapor vent riser grab vapor samples and the indoor air samples were shipped by FedEx under appropriate chain-of-custody protocols to Eurofins Air Toxics Inc., in Folsom, California, for TPHg, BTEX, MTBE, and naphthalene by Modified USEPA Method TO-15 (SIM).

4.1 Grab Riser Pipe Vapor Sample Collection

There are three 4-inch-diameter riser pipes that extend from the vent pipes (GeoVent) to the roof level. Two of the 4-inch riser pipes were joined to a single 6-inch riser pipe by a tee connection (see Figure 3A and cross-section Figure 3B). Each 4-inch-diameter riser pipe at the roof level was installed with a ball valve. A sample port was drilled and tapped into the riser pipe below the ball valve. Figures 3A and 3B show the schematics of the installation.

One vapor sample was collected from each riser pipe (grab riser pipe vapor samples R-1, R-2, and R-3). Prior to sampling, two vacuum readings were taken and recorded: one reading with the ball valve open and one with the ball valve closed. After the ball valve was closed, a high-volume gas pump was used to purge the approximately one

volume of air in the vapor vent riser, as calculated based on the pipe diameter and length of pipe measured from the ground surface (where it connects to the GeoVent) to the ball valve at roof level.

Air samples were collected in 6-liter stainless steel certified clean Summa canisters. Each 6-liter Summa canister was equipped with a flow controller and flow restrictor that use a critical orifice to regulate the flow of air into the canister. The flow controllers were checked by the laboratory to verify that air flow for each canister is set at the appropriate rate for the collection of the grab samples. The canisters were pre-evacuated by the laboratory to approximately -30 inches of mercury (Hg). Grab samples were collected over an approximately 20- to 30-minute period from the effluent sampling ports (Appendix B).

4.2 Indoor Air Sampling

A building walkthrough was conducted prior to implementation of the sample event to identify potential indoor air sources of chemicals of concern. A photo log documenting the walkthrough is included as Appendix C. Note that the building was still under construction at the time of sampling but the internal structure had been fully installed; therefore, the general air circulation patterns that are expected to be present due to the building layout are considered representative of post-construction conditions. However, ongoing construction activities at the time of sampling included building finish work, and chemicals (e.g., paint, adhesives) were stored in the general work area during the building walkthrough and indoor air sample event. The presence of these chemicals could contribute to volatile organic compounds (VOCs) measured in the indoor air samples collected on September 14, 2015.

Six eight-hour integrated air samples (IA-01 through IA-06; Figure 5) were collected prior to heating, ventilation, and air conditioning (HVAC) installation so these samples are representative of conditions with the building HVAC turned off. The indoor air samples were collected in accordance with the Air Monitoring Plan (Arcadis 2015a). Two outdoor ambient air samples (OA-3 and OA-4; Figure 5) were collected within one hour of the start of the indoor air sampling. The locations of OA-3 and OA-4 are shown on Figure 5.

5. Analytical Results

Indoor air samples (IA-01 through IA-06), grab riser pipe samples (R1, R2, and R3), and two outdoor air samples (OA-3 and OA-4) were collected on September 14, 2015.

The analytical results are presented in Table 1, and detected concentrations are discussed in detail below. Laboratory analytical reports are included in Appendix D.

5.1 Grab Riser Pipe Vapor Sample Results

The grab riser pipe vapor samples were collected to evaluate concentrations of VOCs present in the vapors collected and mitigated by the VIM system. Benzene, toluene, ethylbenzene, m,p-xylene, o-xylene, MTBE, and TPHg were detected in the collected vapor samples, as follows:

- Benzene was detected at concentrations ranging from 3.0 micrograms per cubic meter (µg/m^3) in the sample collected from riser pipe R-1 to 5.6 µg/m^3 in riser pipe R-3.
- Toluene was detected at concentrations ranging from 5.5 µg/m^3 in the sample collected from riser pipe R-1 to 7.5 µg/m^3 in riser pipe R-3.
- Ethylbenzene was detected at concentrations ranging from 3.1 µg/m^3 in the sample collected from riser pipe R-1 to 6.1 µg/m^3 in riser pipe R-3.
- M,p-xylene was detected at concentrations ranging from 2.5 µg/m^3 in the sample collected from riser pipe R-2 to 4.8 µg/m^3 in riser pipe R-1.
- O-xylene was detected at concentrations ranging from 3.5 µg/m^3 in the sample collected from riser pipe R-1 to 4.5 µg/m^3 in riser pipe R-2.
- MTBE was detected at concentrations ranging from 1.1 µg/m^3 in the sample collected from riser pipe R-1 to 13 µg/m^3 in riser pipe R-3.
- TPHg was detected at concentrations ranging from 9,000 µg/m^3 in the sample collected from riser pipe R-1 to 16,000 µg/m^3 in riser pipe R-3.

Naphthalene was not detected above the laboratory reporting limit of 3.6 µg/m^3 (as reported from the sample collected from riser pipe R-1) to the reporting limit of 6.9 µg/m^3 (as reported from the samples collected from riser pipes R-2 and R-3).

5.2 Indoor Air Analytical Results

The indoor air samples were collected to evaluate concentrations of VOCs present in indoor air following installation of the VIM system. Results are compared using a tiered approach as described in the Indoor Air Monitoring Plan. Specifically, USEPA Regional Screening Levels (RSLs) (USEPA 2015) for residential air quality criteria with

exceptions for specific compounds as noted by Human Health Risk Assessment (HHRA) Note Number 3 (DTSC 2015) were used to evaluate health-based screening criteria. Sample results were also compared to outdoor air concentrations to evaluate whether indoor air quality may be affected by ambient sources. Human health-based screening criteria, indoor air, and outdoor air results are presented in Table 1. As summarized, benzene, toluene, ethylbenzene, m,p-xylene, o-xylene, MTBE, and TPHg were detected in the collected indoor air samples. However, with the exception of benzene, the other detected COPCs were below their respective health risk-based soil vapor thresholds (Table 1).

As shown in Table 1, the residential RSL for benzene is 0.097 µg/m^3 and the benzene analytical reporting limit for non-detect results was above the screening level. The samples were reported as both detected and not detected above analytical reporting limits. Vapor intrusion potential was evaluated by comparing indoor air results to outdoor air results and to published indoor air benzene values, as follows:

- The laboratory reported concentrations observed in indoor air and outdoor air are very similar for benzene; specifically, the detection limit reported for the two non-detect results for the outdoor air samples was 0.28 µg/m^3 compared with the estimated results for (J-flagged) detect and non-detect results, which ranged from 0.26J µg/m^3 to 0.28 µg/m^3 benzene for the indoor air samples.
- According to the USEPA, indoor air typically has detectable concentrations of benzene up to 5 µg/m^3 due to ambient benzene levels accumulating indoors (USEPA 2011).
- Additionally, a nearby monitoring location is located in Berkeley and the annual average concentration of benzene in outdoor air is reported for 2008 at 0.875 µg/m^3 and 2009 at 0.531 µg/m^3 (Bay Area Air Quality Management District [BAAQMD] 2009).

The benzene concentrations detected in indoor air are similar to the outdoor air results, and the results are within the expected background concentrations published by the USEPA and BAAQMD. As such, these observations of benzene in indoor air are likely attributable to ambient contributions.

Note that naphthalene was not detected in any indoor air or outdoor air samples above the respective health-based screening criteria (i.e., the detection limit was above the human health-based screening level). However, naphthalene is also not detected in the grab riser pipe vapor samples at non-detect concentrations that are below the non-

detect concentrations measured in the indoor air samples (specifically as reported at riser pipe sample location R-1). As such, even though the laboratory detection limit is above the respective health-based screening criteria, the results are not considered a vapor intrusion concern.

Note that TPHg (based on a low carbon range aliphatic mixture) was detected in indoor air and outdoor air samples during the baseline sampling event, indicating ambient contributions of TPHg to indoor air, although the detected concentrations were below heath-based screening criteria. In addition, during the building walkthrough, it was observed that portions of the walls were freshly painted and cans of paint were found in parts of the building (see Photo Log; Appendix C). These could also be a likely contributor to the detection of other VOCs such as toluene, ethylbenzene, and xylenes measured (at concentrations below the respective health-based levels) in the indoor samples collected during the baseline sample event. The indoor air and outdoor air sample results indicate that ambient air quality likely impacts indoor air quality at the Site. As such, further optimization of the VIM system would not provide a significant improvement to indoor air quality in Building 300.

6. Conclusion and Recommendations

Indoor air concentrations were screened against human health-based screening criteria developed for the protection of the resident using the methodology recommended by DTSC Human and Ecological Risk Office (HERO) (DTSC 2015). Based on the analytical results for benzene and TPHg detected in the riser pipe samples, the VIM system is effective in reducing between 91 and 95 percent of benzene concentrations, and approximately 99 percent of TPHg concentrations detected in the subsurface. These estimates are conservative as they assume that ambient levels of benzene and TPHg do not contribute to the observed indoor air sample concentrations even though there is likely a significant contribution of ambient air quality to the presence of these compounds observed in indoor air quality at Building 300, as described further below.

Although there are low levels of benzene present in the indoor air samples, they are below the USEPA published values for benzene in indoor air. In addition, the estimated detections and reported results below the laboratory reporting limit are similar to the reported results below the laboratory reporting limit for the outdoor air samples, which represent the ambient levels of benzene in outdoor air at the time of sampling. These similar results for detected and non-detected concentrations of benzene for indoor air and outdoor air samples (the detected concentrations are below reported indoor

levels), coupled with the observations made in outdoor air in the Bay Area in general, indicate that the concentrations detected in the indoor air samples are likely ambient and not due to on-site sources. In fact, in reviewing a summary of ambient air monitoring data for the Bay Area, benzene is commonly detected in outdoor air.

Since the ambient benzene, TPHg, and potential indoor VOC sources are likely the majority contributors to the indoor analytical results, Arcadis recommends that the new Building 300 is acceptable for occupancy. Additionally, as part of the validation process for the VIM system and to confirm that additional active sub-slab depressurization is not needed, an additional semiannual indoor air sampling event is proposed to be conducted in approximately 6 months to evaluate the building in accordance with a seasonal sampling schedule and provide additional confirmation of the effectiveness of the VIM system. Based on the results of this evaluation, the indoor air quality is suitable for the gymnasium to be used and occupied.

7. References

Alameda County Department of Environmental Health (ACEH). 2009. Revised CAP approval letter to Aspire Charter Schools. August 13.

———. 2015. Review of Vapor Mitigation System Design for Proposed Gymnasium Building and Cap Modification Plan and Plan Addendum for Fuel Leak Case No. RO0000411 and GeoTracker Global ID T0600101950, Pacific Electric Motors, 1009 66th Avenue, Oakland, CA 94621. January 8.

Arcadis U.S., Inc. (Arcadis). 2009a. Revised Corrective Action Plan, Proposed Aspire School Site, 1009 66th Avenue, Oakland, California (Fuel Leak Case No. RO0000411). July 17.

———. 2009b. Toxic Substance Control Act Self-Implementing Cleanup Notification and Certification Former Pacific Electric Motors Facility 1009 66th Avenue in Oakland, California. October 23.

———. 2010a. TSCA Letter Report. August 13.

———. 2010b. Soil Removal Action Completion Report. September 15.

———. 2014a. Groundwater Monitoring Report, Former Pacific Electric Motors Site, 1009 66th Avenue, Oakland, California (Fuel Leak Case Number RO0000411). February 28.

———. 2014b. Vapor Intrusion Work Plan, Former Pacific Electric Motors Site, 1009 66th Avenue, Oakland, California (Fuel Leak Case Number RO0000411). July.

———.2014c. Revised Vapor Intrusion Evaluation Work Plan, Former Pacific Motors Site, 1009 66th Avenue, Oakland, California. September 12.

———.2015a. Building 300 Vapor and Indoor Air Monitoring Plan, Former Pacific Motors Site, 1009 66th Avenue, Oakland, California. March 20.

———.2015a. Vapor Intrusion Evaluation Report for Building 200, Former Pacific Motors Site, 1009 66th Avenue, Oakland, California. June 1.

Bay Area Air Quality Management District (BAAQMD). 2009. Summary and Analysis of West Berkeley Air Monitoring Results. April 14.

California Department of Toxic Substances Control (DTSC). 2009. Vapor Intrusion Mitigation Advisory. April. Section 6.3.4 revised May 8.

———. 2011. Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance). October.

———. 2015. Office of Human and Ecological Risk (HERO), Human Health Risk Assessment (HHRA) Note, HERO HHRA Note Number: 3. October.

United States Environmental Protection Agency (USEPA). 2011. Background Indoor Air Concentrations of Volatile Organic Compounds in North American Residences (1990–2005): A Compilation of Statistics for Assessing Vapor Intrusion Office of Solid Waste and Emergency Response. June.

———. 2015. Regional Screening Levels. Available at: http://www.epa.gov/region9/superfund/prg/. June.

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Tables

Table 1
Outdoor Air, Indoor Air, and Riser Pipe Vapor Analytical Results
Former Pacific Electric Motors Facility
1009 66th Avenue, Oakland, California

results reported in micrograms per cubic meter (μg/m3)

Sample ID	Sample Date	Benzene	Toluene	Ethyl-benzene	m,p-Xylene	o-Xylene	MTBE	TPHg	Naphthalene
Indoor Air and Outdoor Air Sample Results									
USEPA Residential RSL for Indoor Air/DTSC Note 3		0.097	310	1.1	100	100	11	630*	0.083
IA-01	9/14/2015	**0.27**	3.4	0.45	1.8	0.74	<0.59	130	<4.3
IA-02	9/14/2015	**0.28**	3.9	0.52	2.1	1.0	<0.62	130	<4.5
IA-03	9/14/2015	**0.26 J**	4.4	0.52	2.2	0.95	<0.60	130	<4.4
IA-04	9/14/2015	<0.27	3.9	0.49	1.9	0.87	<0.60	120	<4.4
IA-05	9/14/2015	<0.28	2.4	0.50	2.1	0.77	<0.63	94	<4.6
IA-06	9/14/2015	**0.28**	3.6	0.54	2.2	0.86	<0.59	130	<4.3
OA-3	9/14/2015	<0.28	0.40	<0.15	<0.30	<0.15	<0.62	74	<4.5
OA-4	9/14/2015	<0.28	0.39	<0.15	<0.30	<0.15	<0.63	<72	<4.6
Riser Pipe Grab Sample Results									
R-1	9/14/2015	3.0	5.5	3.1	4.8	3.5	1.1	9,000	<3.6
R-2	9/14/2015	3.9	6.2	5.6	2.5	4.5	3.0	13,000	<6.9
R-3	9/14/2015	5.6	7.5	6.1	4.2	4.0	13	16,000	<6.9

Notes:
Samples analyzed using USEPA Method TO-15 with selective ion monitoring (SIM)

Bold indicates result above the screening level
DTSC = Department of Toxic Substances Control
MTBE = methyl tertiary-butyl ether
RSL = Regional Screening Level
TPHg = total petroleum hydrocarbons as gasoline
USEPA = United States Environmental Protection Agency

* = based on USEPA RSL for total petroleum hydrocarbons (aliphatic low); direct measurement of TPH (aromatic low) is provided by analysis of benzene, toluene, ethylbenzene, and xylenes (BTEX) compounds.

< = not detected above the reporting limit
-- = not available

References:
California Department of Toxic Substances Control (DTSC). 2015. Human Health Risk Assessment (HHRA) Note Number: 3, DTSC-modified Screening Levels. October.
United States Environmental Protection Agency (USEPA). 2015. Regional Screening Level for Resident Ambient Air Table. June.

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Figures

MAP SOURCE: Copyright 1995, Thomas Bros. Map ALAMEDA COUNTY 2002 Edition

0 2,000 4,000 FEET

1009 66TH AVENUE, OAKLAND, CALIFORNIA

SITE VICINITY MAP

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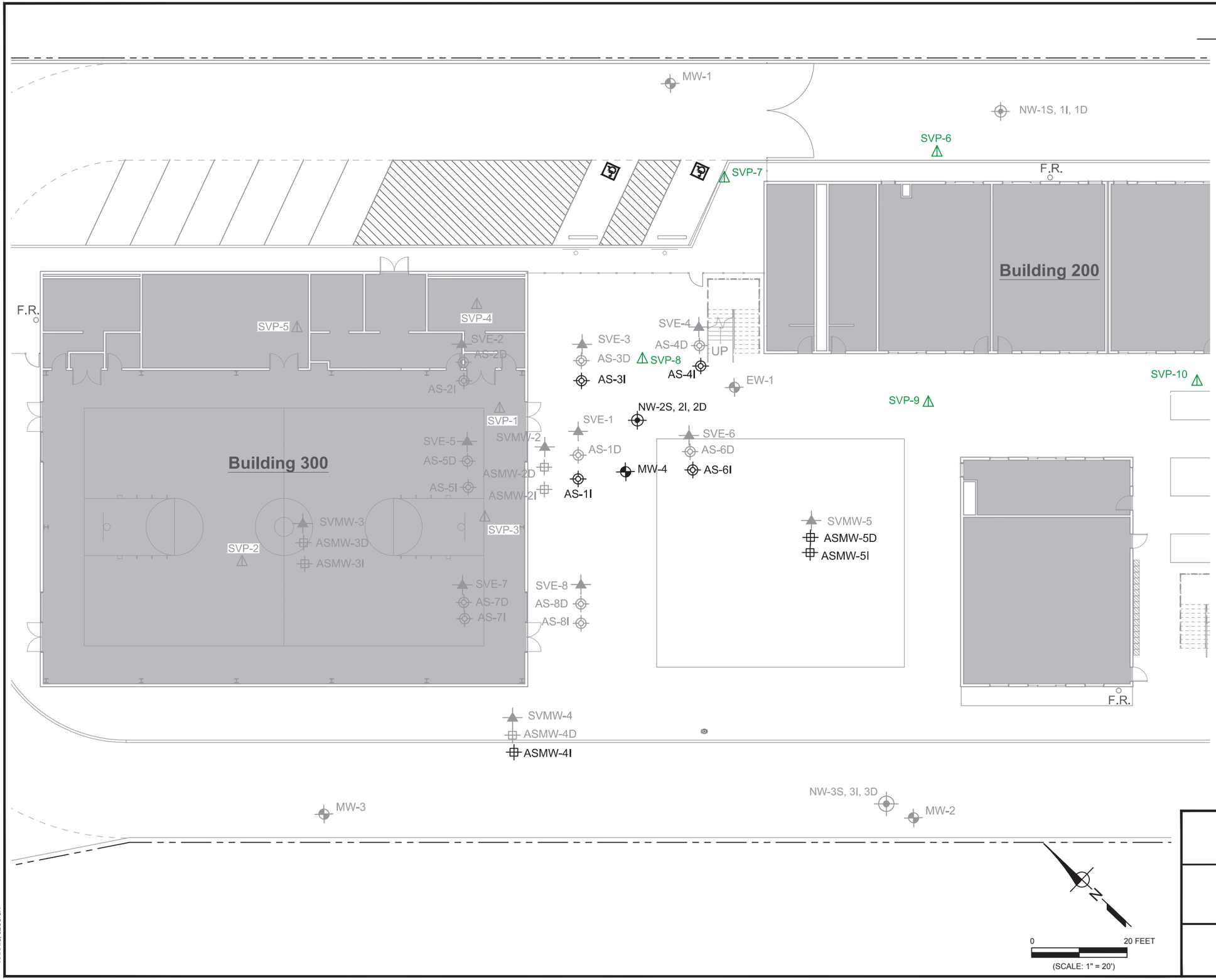
FIGURE 1

DESIGN\003\09155\Figure 1 Site Vicinity - 003-09155.cdr



LEGEND:

- Property Line
- MW-4 Monitoring Well
- NW-2S Nested Monitoring Well
- AS-6I Air Injection Well
- ASMW-5D Air Injection Monitoring Well
- SVE-1 SVE or SVE Monitoring Well
- SVP-9 Soil Vapor Point Location
- SVP-4 Abandoned Soil Vapor Point Location

NOTES:

SVE = Soil Vapor Extraction
GREY symbols represent abandoned well locations

AS-BUILT

PROPOSED CHARTER SCHOOL SITE
1009 66TH AVENUE
OAKLAND, CALIFORNIA

SITE PLAN

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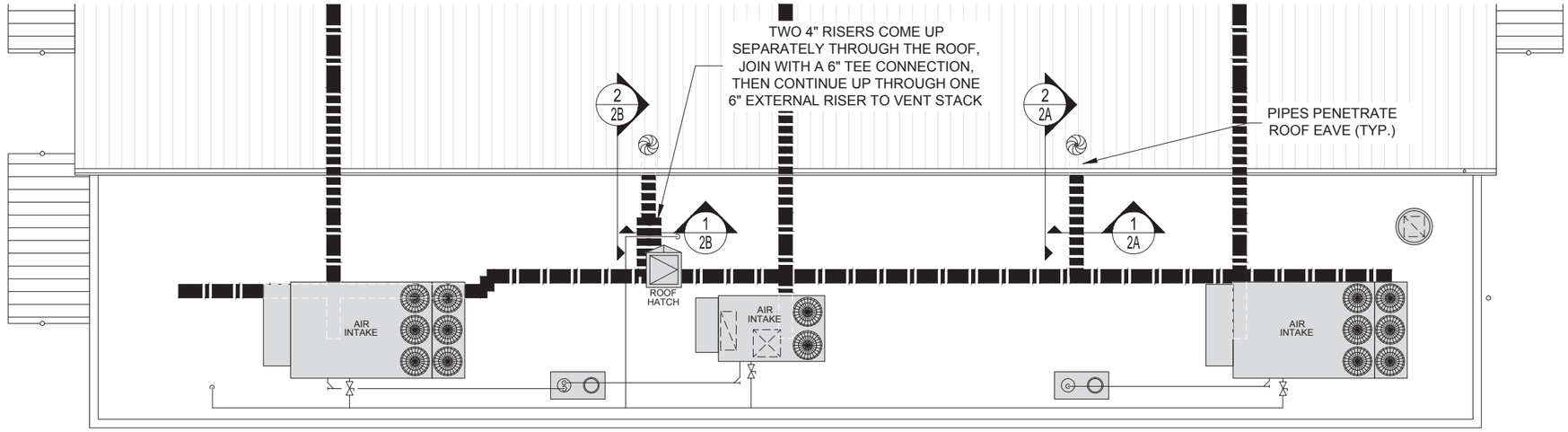
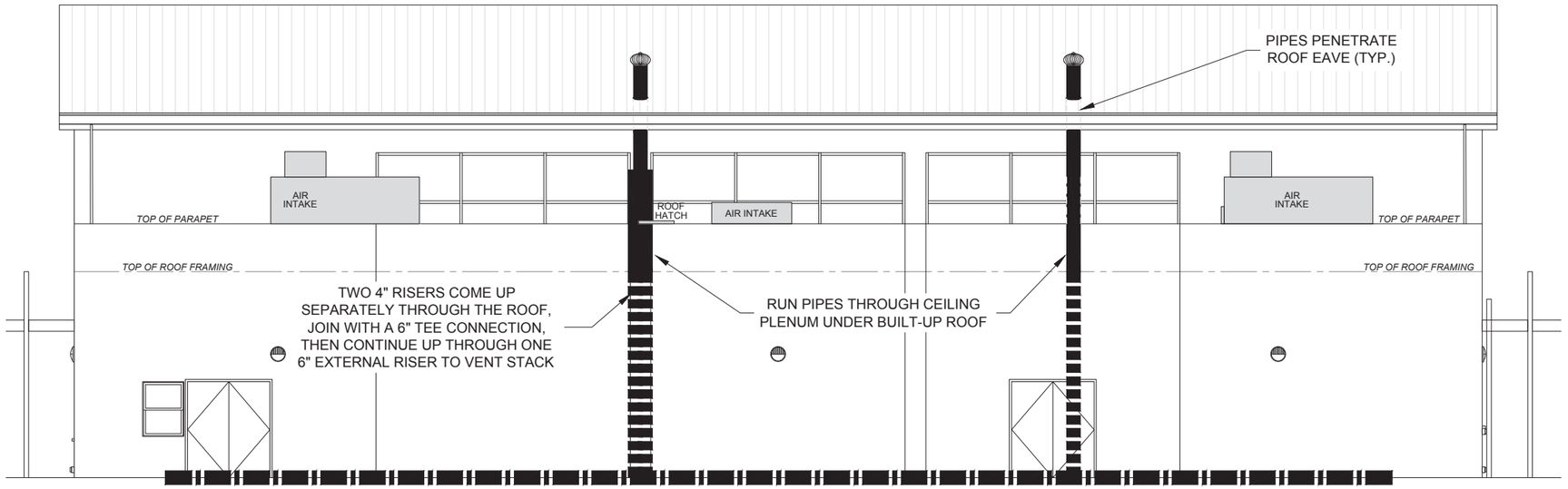
FIGURE
2



ROOF PLAN VIEW

LEGEND

- SUBSLAB GEO-SEAL® VAPOR-VENT ™ SYSTEM
- INTERIOR SCH. 40 PVC VENT RISER
- EXTERIOR SCH. 80 PVC VENT RISER
- EMPIRE VENTILATOR TV04G WIND TURBINE WITH THRUST BEARINGS



1 VC4 VC6 **NORTHEAST ELEVATION**

0 4' 8'
APPROXIMATE SCALE IN FEET

SOURCE:
K2A ARCHITECTURE + INTERIORS GRADING AND PAVING PLANS

AS-BUILT

PROPOSED CHARTER SCHOOL SITE
1009 66TH AVENUE
OAKLAND, CALIFORNIA

BUILDING 300 VAPOR COLLECTION PIPE PENETRATION DETAILS

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FIGURE
3

CITY: EMERYVILLE, CA DIV/GROUP: ENVCAD DB: A. REYES, J. HARRIS
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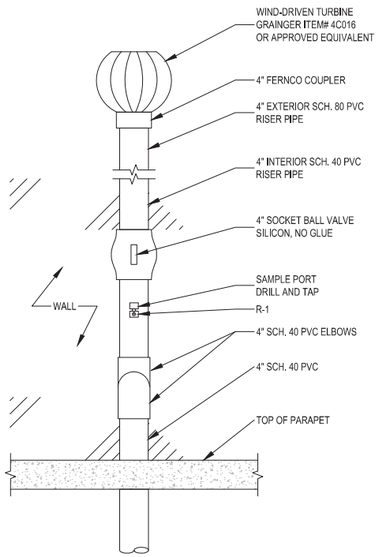
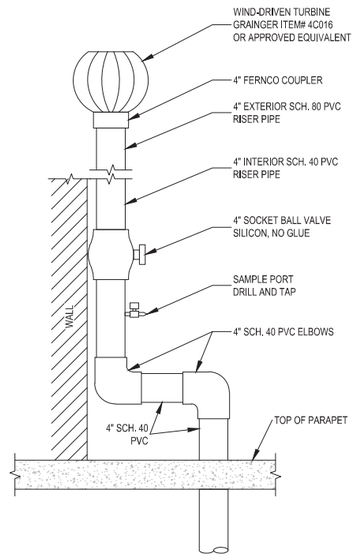


1
2A

FRONT VIEW

NOT TO SCALE



2
2A

SIDE VIEW

NOT TO SCALE

AS-BUILT

PROPOSED CHARTER SCHOOL SITE
1009 66TH AVENUE
OAKLAND, CALIFORNIA

SAMPLING PORT DETAILS

ARCADIS

FIGURE
3A

CITY: EMERYVILLE, CA DIV/GROUP: ENV/CAD DB: A. REYES, J. HARRIS
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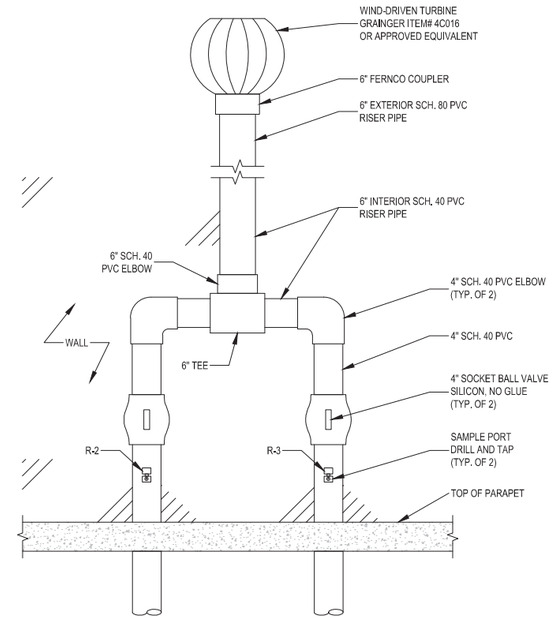
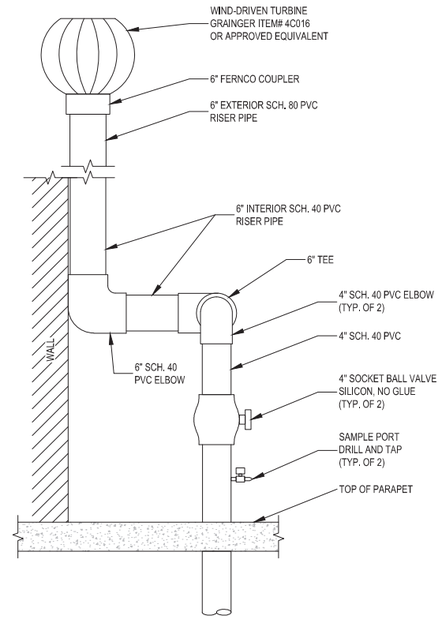


1 2B **FRONT VIEW**
NOT TO SCALE



2 2B **SIDE VIEW**
NOT TO SCALE

AS-BUILT

PROPOSED CHARTER SCHOOL SITE
1009 66TH AVENUE
OAKLAND, CALIFORNIA

SAMPLING PORT DETAILS

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FIGURE
3B

IA-01	
Benzene	**0.27**
Toluene	3.4
Ethylbenzene	0.45
m,p-Xylene	1.8
o-Xylene	0.74
MTBE	,0.59
TPH-GRO	130
Naph (TO-15)	<4.3
Naph (TO-17)	---

IA-02	
Benzene	**0.28**
Toluene	3.9
Ethylbenzene	0.52
m,p-Xylene	2.1
o-Xylene	1.0
MTBE	<0.62
TPH-GRO	130
Naph (TO-15)	<4.5
Naph (TO-17)	---

IA-03	
Benzene	**0.26 J**
Toluene	4.4
Ethylbenzene	0.52
m,p-Xylene	2.2
o-Xylene	0.95
MTBE	<0.60
TPH-GRO	130
Naph (TO-15)	<4.4
Naph (TO-17)	---

IA-04	
Benzene	<0.27
Toluene	3.9
Ethylbenzene	0.49
m,p-Xylene	1.9
o-Xylene	0.87
MTBE	<0.60
TPH-GRO	120
Naph (TO-15)	<4.4
Naph (TO-17)	---

OA-3	
Benzene	<0.28
Toluene	0.40
Ethylbenzene	<0.15
m,p-Xylene	<0.30
o-Xylene	<0.15
MTBE	<0.62
TPH-GRO	74
Naph (TO-15)	<4.5
Naph (TO-17)	---

OA-4	
Benzene	<0.28
Toluene	0.39
Ethylbenzene	<0.15
m,p-Xylene	<0.30
o-Xylene	<0.15
MTBE	<0.63
TPH-GRO	<72
Naph (TO-15)	<4.6
Naph (TO-17)	---

IA-05	
Benzene	<0.28
Toluene	2.4
Ethylbenzene	0.50
m,p-Xylene	2.1
o-Xylene	0.77
MTBE	<0.63
TPH-GRO	94
Naph (TO-15)	<4.6
Naph (TO-17)	---

IA-06	
Benzene	**0.28**
Toluene	3.6
Ethylbenzene	0.54
m,p-Xylene	2.2
o-Xylene	0.86
MTBE	<0.59
TPH-GRO	130
Naph (TO-15)	<4.3
Naph (TO-17)	---

F.R.

Building 300

RESTROOMS

UP

EW-1

LEGEND:

- MW-4 — Monitoring Well
- NW-2S, 2I, 2D — Nested Monitoring Well
- AS-7I — Air Injection Well
- ASMW-5D — Air Injection Monitoring Well
- SVE-1 — SVE or SVE Monitoring Well
- SVP-1 — Soil Vapor Point Location
- IA-01 — Indoor Air Sampling Location
- OA-3 — Outdoor Air Sampling Location
- 1 ft x 4 ft Vent

GREY symbols represent abandoned well locations
SVE = Soil Vapor Extraction
MTBE = Methyl Tertiary-Butyl Ether
TPH-GRO = Total Petroleum Hydrocarbons as Gasoline Range Organics
Naph (TO-15) = Naphthalene Sampled Using USEPA Method TO-15
Naph (TO-17) = Naphthalene Sampled Using USEPA Method TO-17
< = Not Detected above the Laboratory Reporting Limit Given
NS = Not Sampled
--- = Not Sampled for Naph (TO-17)
BOLD = Indicates Result above the Screening Level
All Results are in Micrograms per Cubic Meter (µg/m³)

N

0 20 FEET

(SCALE: 1" = 20')

AS-BUILT

PROPOSED CHARTER SCHOOL SITE
1009 66TH AVENUE
OAKLAND, CALIFORNIA

INDOOR AND OUTDOOR AIR SAMPLE LOCATIONS AND ANALYTICAL RESULTS

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FIGURE 4

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Appendix **A**

Inspection Report for Vapor Intrusion Mitigation System

ARCADIS U.S., Inc.
2000 Powell Street
Suite 700
Emeryville
California 94608
Tel 510 652 4500
Fax 510 652 4906
www.arcadis-us.com

ENVIRONMENT

Jose Jimenez
Construction Manager
Aspire College
1009 66th Avenue
Oakland, California

Subject:
Inspection Report for Vapor Intrusion Mitigation System
Aspire College – 1009 66th Avenue, Oakland, California

Date:
April 13, 2015

Contact:
Lucas Goldstein

Phone:
510.596.9535

Email:
Lucas.Goldstein@arcadis-us.com

Our ref:
EM009155.00017.00001

Dear Sir/Madam:

ARCADIS has prepared this Inspection Report for the installation of a vapor-tight membrane that is part of the vapor mitigation system presented in ARCADIS' Design Drawings dated January 7, 2015.

The vapor-tight membrane barrier was installed between April 7 and 8, 2015 by Advanced Construction Technologies (ACT). The vapor intrusion mitigation system comprises of the Vapor-Vent™ Soil Gas Collection system and vapor-tight membrane (Geo-Seal™). ACT's training certification by the manufacturer (Land Science Technologies) is attached as Attachment A.

Inspection of the vapor intrusion mitigation system was conducted by Marisa Landicho of ARCADIS with oversight by me. The installation was performed in accordance with the Design Drawings (with minor field changes noted in the attached redline as-built markups) and in accordance with the Land Science Technologies Geo-Seal™ Advanced Vapor Management Technology Inspector Training Manual (the Installation Manual).

Quality Control and Quality Assurance

A total of 15 coupon samples were collected to verify the Geo-Seal Core thickness. Each coupon sample is a 3 inch square sample from the membrane. Each side (labeled as A, B, C and D on the Inspection Log included as Attachment B) of the coupon sample was measured by an electronic caliper and noted on the Inspection Log. Six initial coupon samples were collected (Sample IDs 01 through 06) and four out of these six samples did not pass the criteria of the minimum thickness of 63 mils for a cured measurement of 60 mils. The sampling locations were then patched,

additional coast of Geo-Seal were applied to the suspect areas to increase the liner to the specified thickness, and additional nine coupon samples were collected at locations in the vicinity of the six initial samples to confirm the thickness. All the nine of the final confirmation coupon samples passed the criteria of a minimum thickness of 63 mils. The locations of the coupon samples are shown on the figure included as Attachment C.

Two smoke tests were conducted to assess the overall integrity of the line in accordance with the on April 7, 2015; one on the northern area and one on the southern area. This test was used to visually verify and confirm the proper installation of the vapor-tight membrane. Visual verification of soundness of seams, terminations and penetrations were performed. Any deficiencies identified by smoke were noted and repaired by ACT during the test.

Closing

The Geo-Seal barrier was installed and is in substantial compliance with the Design Drawings and manufacturer's specifications. Please note that the vapor barrier installation will be complete once both the concrete footings and the vent risers are installed. Therefore, additional visual inspections are scheduled to be conducted by ARCADIS at the time of placement of concrete to ensure that the terminations are completely sealed and once the vent risers are installed to confirm that the vapor mitigation system was properly installed.

If you have any comments or require additional information, please do not hesitate to contact Erica Kalve of ARCADIS at 415.491.4530 ext. 22 or me at 510-596-9535

Sincerely,

ARCADIS U.S., Inc.

Lucas Goldstein, P.E. (PE-CA, #C72455)
Principal Engineer

Attachments:

Attachment A Certification of ACT by Manufacturer

Attachment B Field Inspection Log

Attachment C As-Built Redline Markups for Geo-Seal Barrier

Copies:
Tim Simons, Aspire Public Schools
Erica Kalve, ARCADIS

ARCADIS

Attachment A

Certification of ACT by Manufacturer

Land Science™ Technologies
1011 Calle Sombra - Ste. 110, San Clemente, CA 92673 P.949.366.8000 F.949.366.8090 www.landsciencetech.com

February 19, 2013

Scott Cole
Advanced Construction Technologies
77 Bunsen
Irvine, CA 92618

Re: Applicator Certification

Dear Scott,

This is to inform you that Advanced Construction Technologies is certified by Land Science Technologies™ for the installation of the Geo-Seal® system.

Sincerely,

Kelly Ameli
National Sales Manager
Land Science Technologies
kameli@landsciencetech.com
949.892.0542

ARCADIS

Attachment B

Field Inspection Log

ASPIRE COLLEGE PREP COUPON SAMPLE LOG

EM 009155.0017

~~0.027 SA~~ = THICKNESS (~~mil~~ inches) * ZERO OUT BASE LAYER THICKNESS

DATE	TIME	SAMPLE ID	A NORTH	B EAST	C SOUTH	D WEST
4/7/15	1320	01	0.0395	0.0405	0.0725	0.0890
4/7/15	1325	02	0.0975	0.1250	0.1480	0.1430
4/7/15	1330	03	0.0695	0.0685	0.0855	0.0750
4/7/15	1335	04	0.039	0.0475	0.0480	0.0440
4/7/15	1410	05	0.0385	0.04400	0.04250	0.0510
4/7/15	1415	06	0.0510	0.0535	0.0475	0.0593
		N. PARCEL SMOKE TEST, SPRAY SPOTS W/ SMOKE ESCAPE. SPRAY ENTIRE N. PARCEL AGAIN. TAKE NEW SAMPLES				
4/7/15	1450	07	0.0805	0.0675	0.0915	0.0725
	1455	08	0.0730	0.0845	0.0715	0.0755
	1458	09	0.0920	0.1085	0.1090	0.1085
↓	1500	10	0.1040	0.1090	0.1235	0.0725
4/7/15	1610	11	0.0860	0.0730	0.0655	0.0720
4/7/15	1612	12	0.1005	0.0915	0.0790	0.0805
4/7/15	1614	13	~~0.0805~~ 0.0705	0.0675	0.0640	0.0665
4/7/15	1630	14	0.0655 ~~0.0720~~	0.0710	0.0690	0.0760
4/7/15	1632	15	0.0720	0.0825	0.0655	0.0890

GREEN CIRCLES SHOW THICKNESS MEASUREMENT < 0.063 inches

~~SAMPLE SIZE~~

INSPECTOR = MARISA LANDICHO

ARCADIS

Attachment C

As-Built Redline Markups for Geo-Seal Barrier

GEO-SEAL® VAPOR INTRUSION BARRIER
(FLUID-APPLIED GAS BARRIER VERSION)

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. SUBGRADE PREPARATION
2. VAPOR INTRUSION BARRIER COMPONENTS
3. SEAM SEALER AND ACCESSORIES

1.3 PERFORMANCE RE□UIREMENTS

A. GENERAL: PROVIDE A VAPOR INTRUSION BARRIER SYSTEM THAT PREVENTS THE PASSAGE OF METHANE GAS AND/OR VOLATILE ORGANIC COMPOUND VAPORS AND COMPLIES WITH PHYSICAL RE□UIREMENTS AS DEMONSTRATED BY TESTING PERFORMED BY AN INDEPENDENT TESTING AGENCY OF MANUFACTURER'S CURRENT VAPOR INTRUSION BARRIER FORMULATIONS AND SYSTEM DESIGN.

1.4 SUBMITTALS

A. SUBMIT PRODUCT DATA FOR EACH TYPE OF VAPOR INTRUSION BARRIER, INCLUDING MANUFACTURER'S PRINTED INSTRUCTIONS FOR EVALUATING AND PREPARING THE SUBSTRATE, TECHNICAL DATA, AND TESTED PHYSICAL AND PERFORMANCE PROPERTIES.

B. PROJECT DATA - SUBMIT SHOP DRAWINGS SHOWING E□TENT OF VAPOR INTRUSION BARRIER, INCLUDING DETAILS FOR OVERLAPS, FLASHING, PENETRATIONS, AND OTHER TERMINATION CONDITIONS.

C. SAMPLES - SUBMIT REPRESENTATIVE SAMPLES OF THE FOLLOWING FOR APPROVAL:

1. VAPOR INTRUSION BARRIER COMPONENTS.

D. CERTIFIED INSTALLER CERTIFICATES - SUBMIT CERTIFICATES SIGNED BY MANUFACTURER CERTIFYING THAT INSTALLERS COMPLY WITH REQUIREMENTS UNDER THE "QUALITY ASSURANCE" ARTICLE.

1.5 □UALITY ASSURANCE

A. INSTALLER □UALIFICATIONS: ENGAGE AN E□PERIENCED INSTALLER WHO HAS BEEN TRAINED AND CERTIFIED IN WRITING BY THE MEMBRANE MANUFACTURER, LAND SCIENCE TECHNOLOGIES™ FOR THE INSTALLATION OF THE GEO-SEAL® SYSTEM.

B. MANUFACTURER □UALIFICATION: OBTAIN VAPOR INTRUSION BARRIER MATERIALS AND SYSTEM COMPONENTS FROM A SINGLE MANUFACTURER SOURCE LAND SCIENCE TECHNOLOGIES.

C. PRE-INSTALLATION CONFERENCE: A PRE-INSTALLATION CONFERENCE SHALL BE HELD PRIOR TO APPLICATION OF THE VAPOR INTRUSION BARRIER SYSTEM TO ASSURE PROPER SITE AND INSTALLATION CONDITIONS, TO INCLUDE CONTRACTOR, APPLICATOR, ARCHITECT/ENGINEER, OTHER TRADES INFLUENCED BY VAPOR INTRUSION BARRIER INSTALLATION AND SPECIAL INSPECTOR (IF ANY).

D. APPLY VAPOR INTRUSION BARRIER SYSTEM AND ENSURE APPLICATION, THICKNESS, TE□TURE, AND STANDARD OF WORKMANSHIP ARE ADE□UATE.

1. NOTIFY ENGINEER OR SPECIAL INSPECTOR ONE WEEK IN ADVANCE OF THE DATE AND TIME WHEN APPLICATION WILL BE IMPLEMENTED.
2. IF ENGINEER OR SPECIAL INSPECTOR DETERMINES THAT THE APPLICATION DOES NOT MEET RE□UIREMENTS, REAPPLY UNTIL APPROVED.
3. RETAIN AND MAINTAIN APPROVED APPLICATION DURING CONSTRUCTION IN AN UNDISTURBED CONDITION.

1.6 DELIVERY, STORAGE, AND HANDLING

A. DELIVER MATERIALS TO PROJECT SITE AS SPECIFIED BY MANUFACTURER LABELED WITH MANUFACTURER'S NAME, PRODUCT BRAND NAME AND TYPE, DATE OF MANUFACTURE, SHELF LIFE, AND DIRECTIONS FOR STORING AND MI□ING WITH OTHER COMPONENTS.

B. STORE MATERIALS AS SPECIFIED BY THE MANUFACTURER IN A CLEAN, DRY, PROTECTED LOCATION AND WITHIN THE TEMPERATURE RANGE RE□UIRED BY MANUFACTURER. PROTECT STORED MATERIALS FROM DIRECT SUNLIGHT. IF FREE□ING TEMPERATURES ARE E□PECTED, NECESSARY STEPS SHOULD BE TAKEN TO PREVENT THE FREE□ING OF THE GEO-SEAL® CORE AND GEO-SEAL® CORE DETAIL COMPONENTS.

C. REMOVE AND REPLACE MATERIAL THAT CANNOT BE APPLIED WITHIN ITS STATED SHELF LIFE.

1.7 PROJECT CONDITIONS

A. PROTECT ALL ADJACENT AREAS NOT TO BE INSTALLED ON. WHERE NECESSARY, APPLY MASKING TO PREVENT STAINING OF SURFACES TO REMAIN E□POSED WHEREVER MEMBRANE ABUTS TO OTHER FINISH SURFACES.

B. PERFORM WORK ONLY WHEN E□ISTING AND FORECASTED WEATHER CONDITIONS ARE WITHIN MANUFACTURER'S RECOMMENDATIONS FOR THE MATERIAL AND APPLICATION METHOD USED.

C. MINIMUM CLEARANCE OF 24 INCHES IS RE□UIRED FOR APPLICATION OF PRODUCT. FOR AREAS WITH LESS THAN 24-INCH CLEARANCE, THE MEMBRANE MAY BE APPLIED BY HAND USING GEO-SEAL CORE DETAIL.

D. AMBIENT TEMPERATURE SHALL BE WITHIN MANUFACTURER'S SPECIFICATIONS. (GREATER THAN +45°F/+7°C.) CONSULT MANUFACTURER FOR THE PROPER RE□UIREMENTS WHEN DESIRING TO APPLY GEO-SEAL CORE BELOW 45°F/7°C.

E. ALL PLUMBING, ELECTRICAL, MECHANICAL AND STRUCTURAL ITEMS TO BE UNDER OR PASSING THROUGH THE VAPOR INTRUSION BARRIER SYSTEM SHALL BE POSITIVELY SECURED IN THEIR PROPER POSITIONS AND APPROPRIATELY PROTECTED PRIOR TO MEMBRANE APPLICATION.

F. VAPOR INTRUSION BARRIER SHALL BE INSTALLED BEFORE PLACEMENT OF FILL MATERIAL AND REINFORCING STEEL. WHEN NOT POSSIBLE, ALL E□POSED REINFORCING STEEL SHALL BE MASKED BY GENERAL CONTRACTOR PRIOR TO MEMBRANE APPLICATION.

G. STAKES USED TO SECURE THE CONCRETE FORMS **SHALL NOT PENETRATE** THE VAPOR INTRUSION BARRIER SYSTEM AFTER IT HAS BEEN INSTALLED. IF STAKES NEED TO PUNCTURE THE VAPOR INTRUSION BARRIER SYSTEM AFTER IT HAS BEEN INSTALLED, THE NECESSARY REPAIRS NEED TO BE MADE BY A CERTIFIED GEO-SEAL® APPLICATOR. TO CONFIRM THE STAKING PROCEDURE IS IN AGREEMENT WITH THE MANUFACTURES RECOMMENDATION, CONTACT LAND SCIENCE TECHNOLOGIES.

1.□ WARRANTY

A. GENERAL WARRANTY: THE SPECIAL WARRANTY SPECIFIED IN THIS ARTICLE SHALL NOT DEPRIVE THE OWNER OF OTHER RIGHTS THE OWNER MAY HAVE UNDER OTHER PROVISIONS OF THE CONTRACT DOCUMENTS, AND SHALL BE IN ADDITION TO, AND RUN CONCURRENT WITH, OTHER WARRANTIES MADE BY THE CONTRACTOR UNDER RE□UIREMENTS OF THE CONTRACT DOCUMENTS.

B. SPECIAL WARRANTY: SUBMIT A WRITTEN WARRANTY SIGNED BY VAPOR INTRUSION BARRIER MANUFACTURER AGREEING TO REPAIR OR REPLACE VAPOR INTRUSION BARRIER THAT DOES NOT MEET RE□UIREMENTS OR THAT DOES NOT REMAIN METHANE GAS AND/OR VOLATILE ORGANIC COMPOUND VAPOR TIGHT WITHIN THE SPECIFIED WARRANTY PERIOD. WARRANTY DOES NOT INCLUDE FAILURE OF VAPOR INTRUSION BARRIER DUE TO FAILURE OF SUBSTRATE PREPARED AND TREATED ACCORDING TO RE□UIREMENTS OR FORMATION OF NEW JOINTS AND CRACKS IN THE ATTACHED TO STRUCTURES THAT E□CEED 1/16 INCH (1.5□MM) IN WIDTH.

1. WARRANTY PERIOD: 1 YEAR AFTER DATE OF SUBSTANTIAL COMPLETION. LONGER WARRANTY PERIODS ARE AVAILABLE UPON RE□UEST TO THE MANUFACTURER.

C. LABOR AND MATERIAL WARRANTIES ARE AVAILABLE UPON RE□UEST TO THE MANUFACTURER. PART 2 - PRODUCTS

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. GEO-SEAL®; LAND SCIENCE TECHNOLOGIES™, SAN CLEMENTE, CA. (949) 4□1-□11□

1. GEO-SEAL® BASE SHEET LAYER
2. GEO-SEAL® CORE SPRAY LAYER AND GEO-SEAL® CORE DETAIL
3. GEO-SEAL® BOND PROTECTION LAYER

2.2 VAPOR INTRUSION BARRIER SPRAY MATERIALS

A. FLUID APPLIED VAPOR INTRUSION BARRIER SYSTEM - GEO-SEAL® CORE□A SINGLE COURSE, HIGH BUILD, POLYMER MODIFIED, ASPHALT EMULSION, WATERBORNE AND SPRAY APPLIED AT AMBIENT TEMPERATURES. A NOMINAL THICKNESS OF 60 DRY MILS, UNLESS SPECIFIED OTHERWISE. NON-TOXIC AND ODORLESS. GEO-SEAL® CORE DETAIL HAS SIMILAR PROPERTIES WITH GREATER VISCOSITY AND IS ROLLER OR BRUSH APPLIED. MANUFACTURED BY LAND SCIENCE TECHNOLOGIES™.

B. FLUID APPLIED VAPOR INTRUSION BARRIER PHYSICAL PROPERTIES:

GEO-SEAL® CORE - TYPICAL CURED PROPERTIES

PROPERTIES	TEST METHOD	RESULTS
TENSILE STRENGTH - CORE ONLY	ASTM 412	32 PSI
TENSILE STRENGTH - GEO-SEAL® SYSTEM	ASTM 412	662 PSI
ELONGATION	ASTM 412	4140
RESISTANCE TO DECAY	ASTM E 154 SECTION 13	4□ PERM LOSS
ACCELERATED AGING	ASTM G 23	NO EFFECT
MOISTURE VAPOR TRANSMISSION	ASTM E 96	.026 G/FT²/HR
HYDROSTATIC WATER PRESSURE	ASTM D 751	26 PSI
PERM RATING	ASTM E 96 (US PERMS)	0.21
METHANE TRANSMISSION RATE	ASTM D 1434	PASSED
ADHESION TO CONCRETE □ MASONRY	ASTM C □36□ ASTM C 704	11 LBF./INCH
HARDNESS	ASTM C □36	0
CRACK BRIDGING	ASTM C □36	NO CRACKING
HEAT AGING	ASTM D 406□	PASSED
ENVIRONMENTAL STRESS CRACKING	ASTM D 1693	PASSED
OIL RESISTANCE	ASTM D 543	PASSED
SOIL BURIAL	ASTM D 406□	PASSED
LOW TEMPERATURE FLE□IBILITY	ASTM C □36-00	NO CRACKING AT -20°C
RESISTANCE TO ACIDS:		
ACETIC		30□
SULFURIC AND HYDROCHLORIC		13□
TEMPERATURE EFFECT:		
STABLE		248°F
FLE□IBLE		13°F

GEO-SEAL® CORE DETAIL - TYPICAL CURED PROPERTIES

PROPERTIES	TEST METHOD	RESULTS
TENSILE STRENGTH	ASTM 412	32 PSI
ELONGATION	ASTM 412	3.60□
RESISTANCE TO DECAY	ASTM E 154 SECTION 13	9□ PERM LOSS
ACCELERATED AGING	ASTM G 23	NO EFFECT
MOISTURE VAPOR TRANSMISSION	ASTM E 96	.026 G/FT²/HR
HYDROSTATIC WATER PRESSURE	ASTM D 751	2□ PSI
PERM RATING (US PERMS)	ASTM E 96	0.17
METHANE TRANSMISSION RATE	ASTM D 1434	PASSED
ADHESION TO CONCRETE □ MASONRY	ASTM C □36	7 LBF./INCH
HARDNESS	ASTM C □36	5
CRACK BRIDGING	ASTM C □36	NO CRACKING
LOW TEMPERATURE FLE□IBILITY	ASTM C □36-00	NO CRACKING AT -20°C
RESISTANCE TO ACIDS:		
ACETIC		30□
SULFURIC AND HYDROCHLORIC		13□
TEMPERATURE EFFECT:		
STABLE		248°F
FLE□IBLE		13°F

2.3 VAPOR INTRUSION BARRIER SHEET MATERIALS

A. THE GEO-SEAL® BASE LAYER AND GEO-SEAL® BOND LAYER ARE CHEMICALLY RESISTANT SHEETS COMPRISED OF A 5 MIL HIGH DENSITY POLYETHYLENE SHEET THERMALLY BONDED TO A 3 OUNCE NON WOVEN GEOTE□TILE.

B. SHEET COURSE USAGE

1. AS FOUNDATION BASE LAYER, USE GEO-SEAL® BASE COURSE AND/OR OTHER BASE SHEET AS RE□UIRED OR APPROVED BY THE MANUFACTURER.
2. AS TOP PROTECTIVE LAYER, USE GEO-SEAL® BOND LAYER AND/OR OTHER PROTECTION AS RE□UIRED OR APPROVED BY THE MANUFACTURER.

C. GEO-SEAL® BOND AND GEO-SEAL® BASE PHYSICAL PROPERTIES:

PROPERTIES	TEST METHOD	RESULTS
FILM THICKNESS		5 MIL
COMPOSITE THICKNESS		1□ MIL
WATER VAPOR PERMEABILITY	ASTM E 96	0.214
ADHESION TO CONCRETE	ASTM D 1970	9.2 LBS/INCH
DART IMPACT	ASTM D 1970	□1070 GMS, METHOD A
		594 GMS, METHOD B
PUNCTURE PROPERTIES TEAR	ASTM B 25. 2 MD	11,290 GMS
	ASTM B 25. 2 TD	13,150 GMS

2.4 A□ILLARY MATERIALS

A. SHEET FLASHING: 60-MIL REINFORCED MODIFIED ASPHALT SHEET GOOD WITH DOUBLE-SIDED ADHESIVE.

B. REINFORCING STRIP: MANUFACTURER'S RECOMMENDED POLYPROPYLENE AND POLYESTER FABRIC.

C. GAS VENTING MATERIALS: GEO-SEAL® VAPOR-VENT HD OR GEO-SEAL® VAPOR-VENT POLY, AND ASSOCIATED FITTINGS.

D. SEAM DETAILING SEALANT MASTIC: GEO-SEAL® CORE DETAIL, A HIGH OR MEDIUM VISCOSITY POLYMER MODIFIED WATER BASED ASPHALT MATERIAL.

1. BACK ROD: CLOSED-CELL POLYETHYLENE FOAM.

PART 3 - E□ECUTION

3.1 AU□ILIARY MATERIALS

A. E□AMINE SUBSTRATES, AREAS, AND CONDITIONS UNDER WHICH VAPOR INTRUSION BARRIER WILL BE APPLIED, WITH INSTALLER PRESENT, FOR COMPLIANCE WITH RE□UIREMENTS. DO NOT PROCEED WITH INSTALLATION UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

3.2 SUBGRADE SURFACE PREPARATION

A. VERIFY SUBSTRATE IS PREPARED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS. ON A HORI□ONTAL SURFACE, THE SUBSTRATE SHOULD BE FREE FROM MATERIAL THAT CAN POTENTIALLY PUNCTURE THE VAPOR INTRUSION BARRIER. ADDITIONAL PROTECTION OR CUSHION LAYERS MIGHT BE RE□UIRED IF THE AGGREGATE (WASHED ROCK) SUBSTRATE CONTAINS TOO MANY JAGGED POINTS AND EDGES THAT COULD PUNCTURE ONE OR MORE OF THE SYSTEM COMPONENTS. CONTACT MANUFACTURER TO CONFIRM SUBSTRATE IS WITHIN MANUFACTURES RECOMMENDATIONS.

B. AGGREGATE: CONTACT THE MANUFACTURER TO ENSURE THE AGGREGATE LAYER WILL NOT BE DETRIMENTAL TO THE MEMBRANE. **THE GRAVEL LAYER MUST BE COMPACTED AND ROLLED FLAT.** IDEALLY A ¾" MINUS GRAVEL LAYER WITH ROUNDED EDGES SHOULD BE SPECIFIED; HOWEVER THE GEO-SEAL® SYSTEM CAN ACCOMMODATE A WIDE VARIETY OF DIFFERENT SUBSTRATES. CONTACT LAND□SCIENCE TECHNOLOGIES™ IF THERE ARE QUESTIONS REGARDING THE COMPATIBILITY OF GEO-SEAL® AND THE UTILIZED SUBSTRATE. E□ERCISE CAUTION WHEN SPECIFYING PEA GRAVEL UNDER THE MEMBRANE, IF NOT COMPACTED PROPERLY, PEA GRAVEL CAN BECOME AN□UNSTABLE SUBSTRATE.

C. MASK OFF ADJOINING SURFACE NOT RECEIVING THE VAPOR INTRUSION BARRIER SYSTEM TO PREVENT THE SPILLAGE OR OVER SPRAY AFFECTING OTHER CONSTRUCTION.

D. AGGREGATE SHOULD BE PREPARED AND COMPACTED TO LOCAL BUILDING CODE RE□UIREMENTS.

3.3 PREPARATIONS AND TREATMENT OF TERMINATIONS

A. TERMINATIONS ON HORI□ONTAL AND VERTICAL SURFACES SHOULD EXTEND 6" ONTO THE TERMINATION SURFACE. JOB SPECIFIC CONDITIONS MAY PREVENT A 6" TERMINATION. IN THESE CONDITIONS, CONTACT MANUFACTURER FOR RECOMMENDATIONS.

B. APPLY 30 MILS OF GEO-SEAL® CORE TO THE TERMINATING SURFACE AND THEN EMBED THE GEO-SEAL® BASE LAYER BY PRESSING IT FIRMLY INTO THE GEO-SEAL® CORE LAYER. NEXT, APPLY 60 MILS OF GEO-SEAL® CORE TO THE BASE LAYER. WHEN COMPLETE, APPLY THE GEO-SEAL® BOND LAYER. AFTER THE PLACEMENT OF THE GEO-SEAL® BOND LAYER IS COMPLETE, APPLY A FINAL 30 MIL SEAL OF THE GEO-SEAL® CORE LAYER OVER THE EDGE OF THE TERMINATION. FOR FURTHER CLARIFICATION, REFER TO THE TERMINATION DETAIL PROVIDED BY MANUFACTURER.

C. THE STATED TERMINATION PROCESS IS APPROPRIATE FOR TERMINATING THE MEMBRANE ONTO E□TERIOR FOOTINGS, PILE CAPS, INTERIOR FOOTINGS AND GRADE BEAMS. WHEN TERMINATING THE MEMBRANE TO STEM WALLS OR VERTICAL SURFACES THE SAME PROCESS SHOULD BE USED.

3.4 PREPARATIONS AND TREATMENT OF PENETRATIONS

A. ALL PIPE PENETRATIONS SHOULD BE SECURELY IN PLACE PRIOR TO THE INSTALLATION OF THE GEO-SEAL® SYSTEM. ANY LOOSE PENETRATIONS SHOULD BE SECURED PRIOR TO GEO-SEAL® APPLICATION, AS LOOSE PENETRATIONS COULD POTENTIALLY E□ERT PRESSURE ON THE MEMBRANE AND DAMAGE THE MEMBRANE AFTER INSTALLATION.

B. TO PROPERLY SEAL AROUND PENETRATIONS, CUT A PIECE OF THE GEO-SEAL® BASE LAYER THAT WILL EXTEND 6" BEYOND THE OUTSIDE PERIMETER OF THE PENETRATION. CUT A HOLE IN THE GEO-SEAL® BASE LAYER JUST BIG ENOUGH TO SLIDE OVER THE PENETRATION, ENSURING THE GEO-SEAL® BASE LAYER FITS SNUG AGAINST THE PENETRATION, THIS CAN BE DONE BY CUTTING AN "X" NO LARGER THAN THE INSIDE DIAMETER OF THE PENETRATION. THERE SHOULD NOT BE A GAP LARGER THAN A 1/8" BETWEEN THE GEO-SEAL® BASE LAYER AND THE PENETRATION. OTHER METHODS CAN ALSO BE UTILI□ED, PROVIDED, THERE IS NOT A GAP LARGER THAN 1/8" BETWEEN THE GEO-SEAL® BASE LAYER AND THE PENETRATION.

C. SEAL THE GEO-SEAL® BASE LAYER USING GEO-SEAL® CORE OR GEO-SEAL® CORE DETAIL TO THE UNDERLYING GEO-SEAL® BASE LAYER.

D. APPLY ONE COAT OF GEO-SEAL® CORE DETAIL OR GEO-SEAL® CORE SPRAY TO THE GEO-SEAL® BASE LAYER AND AROUND THE PENETRATION AT A THICKNESS OF 30 MILS. PENETRATIONS SHOULD BE TREATED IN A 6-INCH RADIUS AROUND PENETRATION AND 3 INCHES ONTO PENETRATING OBJECT.

E. EMBED A FABRIC REINFORCING STRIP AFTER THE FIRST APPLICATION OF THE GEO-SEAL® CORE SPRAY OR GEO-SEAL® CORE DETAIL MATERIAL AND THEN APPLY A SECOND 30 MIL COAT OVER THE EMBEDDED JOINT REINFORCING STRIP ENSURING ITS COMPLETE SATURATION OF THE EMBEDDED STRIP AND TIGHT SEAL AROUND THE PENETRATION.

1	01/07/15	UPDATED PER K2A COMMENTS	EK	LG	
No.	Date	Re□isions	By	Ckd	

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: ____ USE TO VERIFY FIGURE REPRODUCTION SCALE

Professional Engineer's Name: LUCAS GOLDSTEIN
Professional Engineer's No.: C72455
State: CA | Date Signed: 11/03/14 | Project Mgr.: EK
Designed by: AK | Drawn by: AR/JLH | Checked by: RS

ARCADIS U.S., INC.

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CONSTRUCTION DOCUMENTS

GENERAL NOTES AND SPECIFICATIONS 1 OF 3

GENERAL

ARCADIS Project No.: EM009155.0017.00001
Date: NOVEMBER 2014

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VC1

F. AFTER THE PLACEMENT OF THE GEO-SEAL® BOND LAYER, A CABLE TIE SHOULD THEN BE PLACED AROUND THE FINISHED PENETRATION. THE CABLE TIE SHOULD BE SNUG, BUT NOT OVERLY TIGHT SO AS TO SLICE INTO THE FINISHED SEAL.

NOTE: A FINAL APPLICATION OF GEO-SEAL® CORE MAY BE USED TO PROVIDE A FINISHING SEAL AFTER THE GEO-SEAL® BOND LAYER HAS BEEN INSTALLED.

NOTE: METAL OR OTHER SLICK PENETRATION SURFACES MAY RE□UIRE TREATMENT IN ORDER TO ACHIEVE PROPER ADHESION. FOR PLASTIC PIPES, SAND PAPER MAY BE USED TO ACHIEVE A PROFILE. AN EMERY CLOTH IS MORE APPROPRIATE FOR METAL SURFACES. AN EMERY CLOTH SHOULD ALSO BE USED TO REMOVE ANY RUST ON METAL SURFACES.

3.5 GEO-SEAL® BASE LAYER INSTALLATION

A. INSTALL THE GEO-SEAL® BASE LAYER OVER SUBSTRATE MATERIAL IN ONE DIRECTION WITH SI□INCH OVERLAPS AND THE GEOTE□TILE (FABRIC SIDE) FACING DOWN.

B. SECURE THE GEO-SEAL® BASE SEAMS BY APPLYING 60 MILS OF GEO-SEAL® CORE BETWEEN THE 6" OVERLAPPED SHEETS WITH THE GEOTE□TILE SIDE DOWN.

C. VISUALLY VERIFY THERE ARE NO GAPS/FISH-MOUTHS IN SEAMS.

D. FOR BEST RESULTS, INSTALL AN EQUAL AMOUNT OF GEO-SEAL® BASE AND GEO-SEAL® CORE IN ONE DAY. LEAVING UNSPRAYED GEO-SEAL® BASE OVERNIGHT MIGHT ALLOW E□CESS MOISTURE TO COLLECT ON THE GEO-SEAL® BASE. IF EXCESS MOISTURE COLLECTS, IT NEEDS TO BE REMOVED.

NOTE: IN WINDY CONDITIONS IT MIGHT BE NECESSARY TO ENCAPSULATE THE SEAM BY SPRAYING THE GEO-SEAL® CORE LAYER OVER THE COMPLETED GEO-SEAL® BASE SEAM.

3.6 GEO-SEAL® CORE APPLICATION

A. SET UP SPRAY E□UIPMENT ACCORDING TO MANUFACTURER'S INSTRUCTIONS.

B. MI□ AND PREPARE MATERIALS ACCORDING TO MANUFACTURER'S INSTRUCTIONS.

C. THE TWO CATALYST NO□□LES (.001) SHOULD BE ADJUSTED TO CROSS AT ABOUT 1□" FROM THE END OF THE WAND. THIS APE□□ OF CATALYST AND EMULSION SPRAY SHOULD THEN BE LESS THAN 24° BUT GREATER THAN 12° FROM THE DESIRED SURFACE WHEN SPRAYING. WHEN PROPERLY SPRAYED THE FAN PATTERN OF THE CATALYST SHOULD RANGE BETWEEN 65° AND 80°.

D. ADJUST THE AMOUNT OF CATALYST USED BASED ON THE AMBIENT AIR TEMPERATURE AND SURFACE TEMPERATURE OF THE SUBSTRATE RECEIVING THE MEMBRANE. IN HOT WEATHER USE LESS CATALYST AS HOT CONDITIONS WILL QUICKLY "BREAK" THE EMULSION AND FACILITATE THE CURING OF THE MEMBRANE. IN COLD CONDITIONS AND ON VERTICAL SURFACES USE MORE CATALYST TO "BREAK" THE EMULSION □UICKER TO E□PEDITE CURING AND SET UP TIME IN COLD CONDITIONS.

E. TO SPRAY THE GEO-SEAL® CORE LAYER, PULL THE TRIGGER ON THE GUN. A 42" FAN PATTERN SHOULD FORM WHEN PROPERLY SPRAYED. APPLY ONE SPRAY COAT OF GEO-SEAL® CORE TO OBTAIN A SEAMLESS MEMBRANE FREE FROM PINHOLES OR SHADOWS, WITH AN AVERAGE DRY FILM THICKNESS OF 60 MILS (1.52 MM).

F. APPLY THE GEO-SEAL® CORE LAYER IN A SPRAY PATTERN THAT IS PERPENDICULAR TO THE APPLICATION SURFACE. THE CONCERN WHEN SPRAYING AT AN ANGLE IS THAT AN AREA MIGHT BE MISSED. USING A PERPENDICULAR SPRAY PATTERN WILL LIMIT VOIDS AND THIN SPOTS, AND WILL ALSO CREATE A UNIFORM AND CONSISTENT MEMBRANE.

G. VERIFY FILM THICKNESS OF VAPOR INTRUSION BARRIER EVERY 500 FT2. (46.45 M2), FOR INFORMATION REGARDING GEO-SEAL® QUALITY CONTROL MEASURES, REFER TO THE □UALITY CONTROL PROCEDURES IN SECTION 3.9 OF THIS SPECIFICATION.

H. THE MEMBRANE WILL GENERALLY CURE IN 24 TO 4□ HOURS. AS A RULE, WHEN TEMPERATURE DECREASES OR HUMIDITY INCREASES, THE CURING OF THE MEMBRANE WILL BE PROLONGED. THE MEMBRANE DOES NOT NEED TO BE FULLY CURED PRIOR THE PLACEMENT OF THE GEO-SEAL® BOND LAYER, PROVIDED MIL THICKNESS HAS BEEN VERIFIED AND A SMOKE TEST WILL BE CONDUCTED.

I. **DO NOT PENETRATE** MEMBRANE AFTER IT HAS BEEN INSTALLED. IF MEMBRANE IS PENETRATED AFTER THE MEMBRANE IS INSTALLED, IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO NOTIFY THE CERTIFIED INSTALLER TO MAKE REPAIRS.

J. IF APPLYING TO A VERTICAL CONCRETE WALL, APPLY GEO-SEAL® CORE DIRECTLY TO CONCRETE SURFACE AND USE MANUFACTURER'S RECOMMENDED PROTECTION MATERIAL BASED ON SITE SPECIFIC CONDITIONS. IF APPLYING GEO-SEAL® AGAINST SHORING, CONTACT MANUFACTURER FOR SITE SPECIFIC INSTALLATION INSTRUCTIONS.

CARE SHOULD BE TAKEN TO NOT TRAP MOISTURE BETWEEN THE LAYERS OF THE MEMBRANE. TRAPPING MOISTURE MAY OCCUR FROM APPLYING A SECOND COAT PRIOR TO THE MEMBRANE CURING. REPAIRS AND DETAILING MAY BE DONE OVER THE GEO-SEAL® CORE LAYER WHEN NOT FULLY CURED.

3.7 GEO-SEAL® BOND PROTECTION COURSE INSTALLATION

A. INSTALL GEO-SEAL® BOND PROTECTION COURSE PERPENDICULAR TO THE DIRECTION OF THE GEO-SEAL® BASE COURSE WITH OVERLAPPED SEAMS OVER NOMINALLY CURED MEMBRANE NO LATER THAN RECOMMENDED BY MANUFACTURER AND BEFORE STARTING SUBSE□UENT CONSTRUCTION OPERATIONS.

B. SWEEP OFF ANY WATER THAT HAS COLLECTED ON THE SURFACE OF THE GEO-SEAL® CORE LAYER, PRIOR TO THE PLACEMENT OF THE GEO-SEAL® BOND LAYER.

C. OVERLAP AND SEAM THE GEO-SEAL® BOND LAYER IN THE SAME MANNER AS THE GEO-SEAL® BASE LAYER.

D. TO EXPEDITE THE CONSTRUCTION PROCESS, THE GEO-SEAL® BOND LAYER CAN BE PLACED OVER THE GEO-SEAL® CORE IMMEDIATELY AFTER THE SPRAY APPLICATION IS COMPLETE, PROVIDED THE GEO-SEAL® CORE MIL THICKNESS HAS BEEN VERIFIED.

3.□ □UALITY ASSURANCE

A. THE GEO-SEAL® SYSTEM MUST BE INSTALLED BY A TRAINED AND CERTIFIED INSTALLER APPROVED BY LAND SCIENCE TECHNOLOGIES™.

B. FOR PROJECTS THAT WILL RE□UIRE A MATERIAL OR LABOR MATERIAL WARRANTY, LAND SCIENCE TECHNOLOGIES™ WILL REQUIRE A MANUFACTURER'S REPRESENTATIVE OR CERTIFIED 3RD PARTY INSPECTOR TO INSPECT AND VERIFY THAT THE MEMBRANE HAS BEEN INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS.

THE CERTIFIED INSTALLER IS RESPONSIBLE FOR CONTACTING THE INSPECTOR FOR INSPECTION. PRIOR TO APPLICATION OF THE MEMBRANE, A NOTICE PERIOD FOR INSPECTION SHOULD BE AGREED UPON BETWEEN THE APPLICATOR AND INSPECTOR.

C. THE MEASUREMENT TOOLS LISTED BELOW WILL HELP VERITY THE THICKNESS OF THE GEO-SEAL® CORE LAYER. AS MEASUREMENT VERIFICATION E□PERIENCE IS GAINED, THESE TOOLS WILL HELP CONFIRM THICKNESS MEASUREMENTS THAT CAN BE OBTAINED BY PRESSING ONE'S FINGERS INTO THE GEO-SEAL® CORE MEMBRANE.

TO VERIFY THE MIL THICKNESS OF THE GEO-SEAL® CORE, THE FOLLOWING MEASUREMENT DEVICES ARE RE□UIRED:

1. MIL READING CALIPER: CALIPERS ARE USED TO MEASURE THE THICKNESS OF COUPON SAMPLES. TO MEASURE COUPON SAMPLES CORRECTLY, THE THICKNESS OF THE GEO-SEAL® SHEET LAYERS (18 MILS EACH) MUST BE TAKEN INTO ACCOUNT. MARK SAMPLE AREA FOR REPAIR.

2. WET MIL THICKNESS GAUGE: A WET MIL THICKNESS GAUGE MAY BE USED TO QUICKLY MEASURE THE MIL THICKNESS OF THE GEO-SEAL® CORE LAYER. THE THICKNESS OF THE GEO-SEAL® SHEET LAYERS DO NOT FACTOR INTO THE MIL THICKNESS READING.

   WHEN FIRST USING A WET MIL THICKNESS GAUGE ON A PROJECT, COLLECT COUPON SAMPLES TO VERIFY THE WET MIL GAUGE THICKNESS READINGS.

3. NEEDLE NOSE DIGITAL DEPTH GAUGE: A NEEDLE NOSE DEPTH GAUGE SHOULD BE USED WHEN MEASURING THE GEO-SEAL® CORE THICKNESS ON VERTICAL WALLS OR IN FIELD MEASUREMENTS. MARK MEASUREMENT AREA FOR REPAIR.

TO OBTAIN A PROPER WET MIL THICKNESS READING, TAKE INTO ACCOUNT THE 5 TO 10 PERCENT SHRINKAGE THAT WILL OCCUR AS THE MEMBRANE FULLY CURES. NOT TAKING INTO ACCOUNT THE THICKNESS OF THE SHEET LAYERS, A FRESHLY SPRAYED MEMBRANE SHOULD HAVE A MINIMUM WET THICKNESS OF 63 (5□) TO 66 (10□) MILS.

METHODS ON HOW TO PROPERLY CONDUCT GEO-SEAL® CORE THICKNESS SAMPLING CAN BE OBTAINED BY REVIEWING LITERATURE PREPARED BY LAND SCIENCE TECHNOLOGIES™.

D. IT SHOULD BE NOTED THAT TAKING TOO MANY DESTRUCTIVE SAMPLES CAN BE DETRIMENTAL TO THE MEMBRANE. AREAS WHERE COUPON SAMPLES HAVE BEEN REMOVED NEED TO BE MARKED FOR REPAIR.

E. VISUAL INSPECTIONS PRIOR TO PLACEMENT OF CONCRETE, BUT AFTER THE INSTALLATION OF CONCRETE REINFORCING, IS RECOMMENDED TO IDENTIFY ANY PUNCTURES THAT MAY HAVE OCCURRED DURING THE INSTALLATION OF REBAR, POST TENSION CABLES, ETC. PUNCTURES IN THE GEO-SEAL® SYSTEM SHOULD BE EASY TO IDENTIFY DUE TO THE COLOR CONTRASTING LAYERS OF THE SYSTEM.

VAPOR-VENT™ SOIL GAS COLLECTION SYSTEM

PART 1 - GAS CONTROL

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. VAPOR-VENT™ INSTALLATION
3. VAPOR-VENT™ ACCESSORIES

1.3 PERFORMANCE RE□UIREMENTS

A. GENERAL: PROVIDE A GAS VENTING MATERIAL THAT COLLECTS GAS VAPORS AND DIRECTS THEM TO DISCHARGE OR TO COLLECTION POINTS AS SPECIFIED IN THE GAS VAPOR COLLECTION SYSTEM DRAWINGS AND COMPLIES WITH THE PHYSICAL RE□UIREMENTS SET FORTH BY THE MANUFACTURER.

1.4 SUBMITTALS

A. SUBMIT PRODUCT DATA FOR EACH TYPE OF GAS VENTING SYSTEM SPECIFIED, INCLUDING MANUFACTURER'S SPECIFICATIONS.

B. SAMPLE - SUBMIT REPRESENTATIVE SAMPLES OF THE FOLLOWING FOR APPROVAL:

2. GAS VENTING, VAPOR-VENT™
3. VAPOR-VENT™ ACCESSORIES

1.5 □UALITY ASSURANCE

A. INSTALLER □UALIFICATIONS: ENGAGE AN E□PERIENCED INSTALLER WHO IS CERTIFIED IN WRITING AND APPROVED BY VAPOR INTRUSION BARRIER MANUFACTURER LAND SCIENCE TECHNOLOGIES™ FOR THE INSTALLATION OF THE GEO-SEAL® VAPOR INTRUSION BARRIER SYSTEM.

B. MANUFACTURER □UALIFICATION: OBTAIN GAS VENTING, VAPOR INTRUSION BARRIER AND SYSTEM COMPONENTS FROM A SINGLE MANUFACTURER LAND SCIENCE TECHNOLOGIES™

C. PRE-INSTALLATION CONFERENCE: A PRE-INSTALLATION CONFERENCE SHALL BE HELD PRIOR TO INSTALLATION OF THE VENTING SYSTEM, VAPOR INTRUSION BARRIER AND WATERPROOFING SYSTEM TO ASSURE PROPER SITE AND INSTALLATION CONDITIONS, TO INCLUDE CONTRACTOR, APPLICATOR, ARCHITECT/ENGINEER AND SPECIAL INSPECTOR (IF ANY).

1.6 DELIVERY, STORAGE, AND HANDLING

A. DELIVER MATERIALS TO PROJECT SITE AS SPECIFIED BY MANUFACTURER LABELED WITH MANUFACTURER'S NAME, PRODUCT BRAND NAME AND TYPE, DATE OF MANUFACTURE, SHELF LIFE, AND DIRECTIONS FOR HANDLING.

B. STORE MATERIALS AS SPECIFIED BY THE MANUFACTURER IN A CLEAN, DRY, PROTECTED LOCATION AND WITHIN THE TEMPERATURE RANGE RE□UIRED BY MANUFACTURER. PROTECT STORED MATERIALS FROM DIRECT SUNLIGHT.

C. REMOVE AND REPLACE MATERIAL THAT IS DAMAGED.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. LAND SCIENCE TECHNOLOGIES™, SAN CLEMENTE, CA. (949) 481-8118

1. VAPOR-VENT™

2.2 GAS VENT MATERIALS

A. VAPOR-VENT™ IS A LOW PROFILE, TRENCHLESS, FLEXIBLE, SUB SLAB VAPOR COLLECTION SYSTEM USED IN LIEU OR IN CONJUNCTION WITH PERFORATED PIPING. VAPOR-VENT™ IS OFFERED WITH TWO DIFFERENT CORE MATERIALS, VAPOR-VENT™ POLY IS RECOMMENDED FOR SITES WITH INERT METHANE GAS AND VAPOR-VENT™ IS RECOMMENDED FOR SITES WITH AGGRESSIVE CHLORINATED VOLATILE ORGANIC OR PETROLEUM VAPORS. MANUFACTURED BY LAND SCIENCE TECHNOLOGIES™

B. VAPOR-VENT™ PHYSICAL PROPERTIES:

VENT PROPERTIES	TEST METHOD	VAPOR-VENT™ POLY	VAPOR-VENT™
MATERIAL:		*POLYSTYRENE*	*HDPE*
COMPREHENSIVE STRENGTH	ASTM D-1621	9,000 LBS/FT²	11,400 LBS/FT²
IN-PLANE FLOW (HYDRAULIC GRADIENT-0.1)	ASTM D-4716	30 GPM/FT OF WIDTH	30 GPM/FT OF WIDTH
CHEMICAL RESISTANCE		N/A	E□CELLENT
FABRIC PROPERTIES:			
GRAB TENSILE STRENGTH	ASTM D-4632	100 LBS.	110 LBS.
PUNCTURE STRENGTH	ASTM D-4□33	65 LBS.	30 LBS.
MULLEN BURST STRENGTH	ASTM D-37□6	N/A	90 PSI
AOS	ASTM D-4751	70 U.S. SIEVE	50 U.S. SIEVE
FLOW RATE	ASTM D-4491	140 GPM/FT²	95 GPM/FT²
UV STABILITY (500 HOURS)	ASTM D-4355	N/A	70□ RETAINED
DIMENSIONAL DATA:			
THICKNESS		1"	1"
STANDARD WIDTHS		12"	12"
ROLL LENGTH		165 FT	165 FT
ROLL WIDTH		65 LBS	6□LBS

2.3 AU□ILIARY MATERIALS

A. VAPOR-VENT™ END OUT

B. REINFORCED TAPE

PART 3 - E□ECUTION

3.1 E□AMINATION

A. E□AMINE SUBSTRATES, AREAS, AND CONDITIONS UNDER WHICH GAS VENT SYSTEM WILL BE INSTALLED, WITH INSTALLER PRESENT, FOR COMPLIANCE WITH RE□UIREMENTS. DO NOT PROCEED WITH INSTALLATION UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

3.2 SUBSTRATE PREPARATION

A. VERIFY SUBSTRATE IS PREPARED ACCORDING TO PROJECT RE□UIREMENTS.

3.3 PREPARATION FOR STRIP COMPOSITE

A. MARK THE LAYOUT OF STRIP GEOCOMPOSITE PER LAYOUT DESIGN DEVELOPED BY ENGINEER.

3.4 STRIP GEOCOMPOSITE INSTALLATION

A. INSTALL VAPOR-VENT™ 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 VAPOR-VENT™ STRIPS INTERSECT CUT AND FOLD BACK FABRIC TO E□POSE THE DIMPLED CORE. ARRANGE THE STRIPS SO THAT THE TOP STRIP INTERCONNECTS INTO THE BOTTOM STRIP. 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 VAPOR-VENT™ OVER FOOTINGS OR GRADE BEAMS, **CONSULT WITH THE SPECIFYING ENVIRONMENTAL ENGINEER AND STRUCTURAL ENGINEER FOR APPROPRIATE USE AND PLACEMENT OF SOLID PIPE MATERIALS**. PLACE SOLID PIPE OVER OR THROUGH CONCRETE SURFACE AND ATTACH A VAPOR-VENT™ END OUT AT BOTH ENDS OF THE PIPE BEFORE CONNECTING THE VAPOR-VENT™ TO THE PIPE REDUCER. SEAL THE VAPOR-VENT™ TO THE VAPOR-VENT™ END OUT USING FABRIC REINFORCEMENT TAPE. REFER TO VAPOR-VENT™ DETAIL PROVIDED BY LAND SCIENCE TECHNOLOGIES™.

D. PLACE VENT RISERS PER SPECIFYING ENGINEER'S PROJECT SPECIFICATIONS. CONNECT VAPOR-VENT™ TO VAPOR-VENT™ END OUT AND SEAL WITH FABRIC REINFORCED TAPE. USE VAPOR-VENT™ END OUT WITH THE SPECIFIED DIAMETER PIPING (4") AS SHOWN ON SYSTEM DRAWINGS.

3.5 PLACEMENT OF OVERLYING AND ADJACENT MATERIALS

A. ALL OVERLYING AND ADJACENT MATERIAL SHALL BE PLACED OR INSTALLED USING APPROVED PROCEDURES AND GUIDELINES TO PREVENT DAMAGE TO THE STRIP GEOCOMPOSITE.

B. E□UIPMENT SHALL NOT BE DIRECTLY DRIVEN OVER AND STAKES OR ANY OTHER MATERIALS MAY NOT BE DRIVEN THROUGH THE STRIP GEOCOMPOSITE.

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Re: isions	By	Ckd
1	01/07/15	UPDATED PER K2A COMMENTS	EK	LG

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Professional Engineer's No.: C72455
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Designed by: AK | Drawn by: AR/JLH | Checked by: RS

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CONSTRUCTION DOCUMENTS

GENERAL NOTES AND SPECIFICATIONS 2 OF 3

GENERAL

ARCADIS Project No.: EM009155.0017.00001
Date: NOVEMBER 2014

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VC2

SMOKE/PRESSURE TEST

FOLLOWING THE GEO-SEAL® VAPOR INTRUSION BARRIER AND THE VAPOR-VENT™ SOIL GAS COLLECTION SYSTEM INSTALLATION, THE FOLLOWING SMOKE/PRESSURE TESTING PROCEDURE SHALL BE IMPLEMENTED TO ASSESS THE VAPOR-TIGHT INTEGRITY OF THE GEO-SEAL® VAPOR INTRUSION BARRIER AND TO ENSURE EVEN DISTRIBUTION OF SMOKE THROUGHOUT THE VAPOR-VENT™ SOIL GAS COLLECTION SYSTEM AND SURROUNDING AGGREGATE LAYER. PRIOR TO INITIATING THE SMOKE/PRESSURE TEST, VERIFY THAT THE GEO-SEAL® VAPOR INTRUSION BARRIER, THE VAPOR-VENT™ SOIL GAS COLLECTION SYSTEM, AND THE AGGREGATE LAYER (WASHED ROCK) ARE APPROPRIATELY INSTALLED. VERIFY THAT ALL GEO-SEAL® PENETRATIONS HAVE BEEN SEALED, AND THAT THE GEO-SEAL® HAS BEEN APPROPRIATELY BATTENED AND SEALED TO THE BUILDING FOUNDATION.

PART 1 - E□UIPMENT

1.1 THE SMOKE/PRESSURE TESTING SHALL BE COMPLETED BY THE CONTRACTOR AND VERIFIED BY THE OWNER, OR ENGINEER. A GENERAL LIST OF THE E□UIPMENT RE□UIRED TO COMPLETE THIS TEST IS OUTLINED BELOW.

- A. PORTABLE AND REVERSIBLE BLOWER OR VENTILATOR CAPABLE OF PRODUCING AN AIRFLOW RATE OF 200 CUBIC FEET PER MINUTE (CFM) AT 2 INCHES WATER COLUMN E□UIVALENCY.
- B. A FIREPROOF SMOKE CHAMBER WITH A 2-INCH HOSE FOR CONNECTION TO THE GEOMEMBRANE VENTILATION HOLE (DESCRIBED BELOW).
- C. INDUSTRIAL SMOKE BOMBS OR CANISTERS SUFFICIENT TO PRODUCE A □UANTITY OF SMOKE E□UAL TO TWO VOLUMES OF THE SOIL VAPOR VENTING SYSTEM (WILL VARY FROM SITE TO SITE, IN GENERAL THE □UANTITY OF SMOKE RE□UIRED IS E□UAL TO APPRO□IMATELY DOUBLE THE VOLUME OF VOID SPACE IN VENTILATION TRENCH, VAPOR PERMEABLE LAYER, AND SOIL VAPOR VENTILATION PIPING).
- D. UTILITY KNIFE, PUNCH BAR, OR SIMILAR DEVICE TO PENETRATE GEOMEMBRANE AS DESCRIBED BELOW TO PROVIDE VENTILATION HOLES.
- E. PAINT OR MARKER FOR IDENTIFYING ANY LEAKS ENCOUNTERED DURING TESTING ACTIVITIES.
- F. SOLVENT CEMENT AND PATCHING MATERIALS TO REPAIR ANY NATURAL OR INDUCED PENETRATIONS OR LEAKS IN LINER.

PART 2 - TEST PROCEDURE

2.1 THE SMOKE/PRESSURE TESTING PROCEDURE IS OUTLINED BELOW.

- A. POSITION THE SMOKE TESTING ASSEMBLY TO CONNECT TO THE VAPOR-VENT™ END OUT RISER STUB-UP PIPING. THE BLOWER WILL BE CONNECTED TO VENTILATE SMOKE FROM THE CHAMBER INTO THE VAPOR-VENT™ SOIL GAS COLLECTION SYSTEM. IN ORDER TO FACILITATE AIRFLOW THROUGH THE AGGREGATE LAYER AND VAPOR-VENT™ SOIL GAS COLLECTION SYSTEM, A PENETRATION OF THE GEO-SEAL® MUST BE MADE TO PROVIDE A VENTILATION HOLE TO ALLOW THE SMOKE TO DISPLACE THE E□ISTING AIR VOLUME. THE INITIAL VENTILATION HOLE SHOULD BE LOCATED ON THE OPPOSITE SIDE OF THE BUILDING FROM THE VAPOR-VENT™ SOIL GAS COLLECTION SYSTEM. FOR EASE OF REPAIR, A HOLE APPRO□IMATELY 2 INCHES IN DIAMETER IS RECOMMENDED.
- B. FOLLOWING INSTALLATION OF THE INITIAL VENT HOLE, IGNITE THE SMOKE BOMBS OR CANISTERS (OF SUFFICIENT □UANTITY TO E□UAL DOUBLE THE VOLUME OF THE VAPOR-VENT™ SOIL GAS COLLECTION SYSTEM) AND PLACE INTO THE SMOKE CHAMBER VIA THE ACCESS PORT. SEAL THE CHAMBER ACCESS PORT WHEN PLACEMENT OF SMOKE BOMBS IS COMPLETED. OPEN INFLUENT AND EFFLUENT VALVES ON SMOKE CHAMBER, ALLOWING BLOWER TO VENTILATE SMOKE THROUGH SOIL VAPOR VENTING SYSTEM. RECORD □UANTITY OF SMOKE BOMBS INTRODUCED TO SYSTEM AND LOCATION OF VENT HOLE.
- C. CLOSELY EXAMINE GEO-SEAL® BARRIER SEAMS, PENETRATIONS, AND PERIMETER BATTEN SEALS TO ENSURE NO LEAKAGE OF SMOKE (OR AIR) OCCURS AT ANY LOCATION OTHER THAN THE VENTILATION HOLE. THE VENT HOLE SHOULD BE CLOSELY MONITORED TO OBSERVE IF AIR AND/OR SMOKE ARE DISPERSED THROUGH THE VAPOR-VENT™ SOIL GAS COLLECTION SYSTEM AND VENTED OUT THROUGH THE PENETRATION. UPWELLING OR FILLING OF THE GEO-SEAL® BARRIER SHOULD ALSO OCCUR AS A LARGER VOLUME OF THE AIR/SMOKE MI□TURE IS INTRODUCED INTO THE SYSTEM. RECORD ALL OBSERVATIONS OF AIR OR SMOKE LEAKAGE, AND UPWELLING AND ASSOCIATED REACTIONS OF THE GEO-SEAL® BARRIER TO THE INTRODUCED AIR PRESSURE. NO LEAKAGE THROUGH THE GEO-SEAL® BARRIER OTHER THAN THROUGH THE VENTILATION HOLE WILL BE ACCEPTABLE FOR THE PURPOSES OF THIS TEST.
- D. IF AIRFLOW AND SMOKE ARE OBSERVED AT THE VENT HOLE LOCATION, THE BLOWER MAY BE SHUT DOWN. THE VENT HOLE SHALL BE APPROPRIATELY PATCHED IN ACCORDANCE WITH MANUFACTURER APPROVED METHODS.
- E. A FINAL PRESSURE TEST WILL BE COMPLETED TO ENSURE THAT THE PENETRATIONS ARE APPROPRIATELY SEALED AND PROVIDE A VAPOR-TIGHT BARRIER BENEATH THE BUILDING SLAB. DURING THIS FINAL PRESSURE TEST, THE GEO-SEAL® BARRIER WILL AGAIN BE INFLATED AND "BALLOON" UPWARDS, FOLLOWING VERIFICATION THAT ALL SEALS AND/OR REPAIRS ARE SUFFICIENT, THE BLOWER FLOW SHALL BE REVERSED TO REMOVE THE TRAPPED AIR FROM BENEATH THE VAPOR-TIGHT GEO-SEAL® BARRIER.
- F. ANY LEAKS IN THE GEO-SEAL® BARRIER, PERIMETER BATTEN SEALS, AND/OR PENETRATIONS OTHER THAN THE INDUCED VENTILATION HOLES SHALL BE MARKED AND APPROPRIATELY REPAIRED, FOLLOWED BY THE COMPLETION OF AN ADDITIONAL SMOKE/PRESSURE TEST TO VERIFY THE VAPOR-TIGHT INTEGRITY OF THE GEO-SEAL® BARRIER.
- G. CONTRACTOR SHALL NOTIFY CONSULTANT AND COORDINATE THE SMOKE TESTING WITH CONSONANT OBSERVATIONS. THE CONSONANT SHALL INSPECT AND APPROVE THE TEST.

MITIGATION SYSTEM NOTES

schedule 40 on interior wall piping and transition to schedule 80 where pipe is on the exterior of the building.

1. ALL VENT RISERS AND FITTINGS SHALL BE 4", SCH. □0, PVC. ALL PIPING CONNECTIONS SHALL BE PRIMED AND SOLVENT WELDED WITH CEMENT CONFORMING TO ASTM D2235.
2. ALL SOLID PVC PIPING INSTALLED HORI□ONTALLY SHALL HAVE A SLOPE OF NOT LESS THAN 1 PERCENT AND SHALL BE SUPPORTED AT A MINIMUM INTERVAL OF 4'. ALL PVC PIPING INSTALLED VERTICALLY SHALL BE SUPPORTED AT A MINIMUM INTERVAL OF 10' AND WITHIN 1 FOOT BELOW ROOF PENETRATION. SWEEP ELBOWS OR E□UIVALENT MUST BE USED IN ALL LOCATIONS WHERE PIPING CHANGES DIRECTION 90 DEGREES.
3. LABELS IDENTIFYING THE MITIGATION SYSTEM PIPING SHALL BE PLACED ON THE PIPING PRIOR TO CLOSING OF WALL CAVITIES.
4. PLUMBING ROUGH-INS SHALL BE FILLED WITH E□PANDING FOAM OR NON-SHRINK GROUT, OR ENGINEER APPROVED E□UIVALENT.
5. ALL OPENINGS, GAPS AND JOINTS IN FLOOR AND WALL ASSEMBLIES IN CONTACT SOIL, OR GAPS AROUND PIPES, TOILETS, BATH TUBS OR DRAINS PENETRATING THESE ASSEMBLIES SHALL BE FILLED OR CLOSED WITH MATERIALS THAT PROVIDE A PERMANENT AIR-TIGHT SEAL. SEAL LARGE OPENINGS WITH NON-SHRINK MORTAR, GROUTS OR E□PANDING FOAM MATERIALS AND SMALLER GAPS WITH AN ELASTOMERIC JOINT SEALANT, AS DEFINED IN ASTM C920-□7.
6. SUBMITTALS FOR ALL E□UIPMENT TO BE PURCHASED SHALL BE APPROVED BY THE ENGINEER
7. PVC PIPING E□POSED TO UV LIGHT SHOULD BE PAINTED WITH KRYLON FUSION OR APPROVED E□UAL.

CITY: EMERYVILLE, CA DIV/GROUP: ENVCAD DB: A. REYES, J. HARRIS

1	01/07/15	UPDATED PER K2A COMMENTS	EK	LG
No.	Date	Re□isions	By	Ckd

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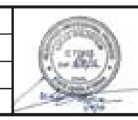
THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

Pro□essional Engineer's Name: LUCAS GOLDSTEIN
Pro□essional Engineer's No.: C72455

State	Date Signed	Project Mgr.
CA	11/03/14	EK
Designed by	Drawn by	Checked by
AK	AR/JLH	RS



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PROPOSED CHARTER SCHOOL SITE ● 1009 66TH AVENUE, OAKLAND, CALIFORNIA
CONSTRUCTION DOCUMENTS

GENERAL NOTES AND SPECIFICATIONS 3 OF 3

GENERAL

ARCADIS Project No. EM009155.0017.00001
Date NOVEMBER 2014
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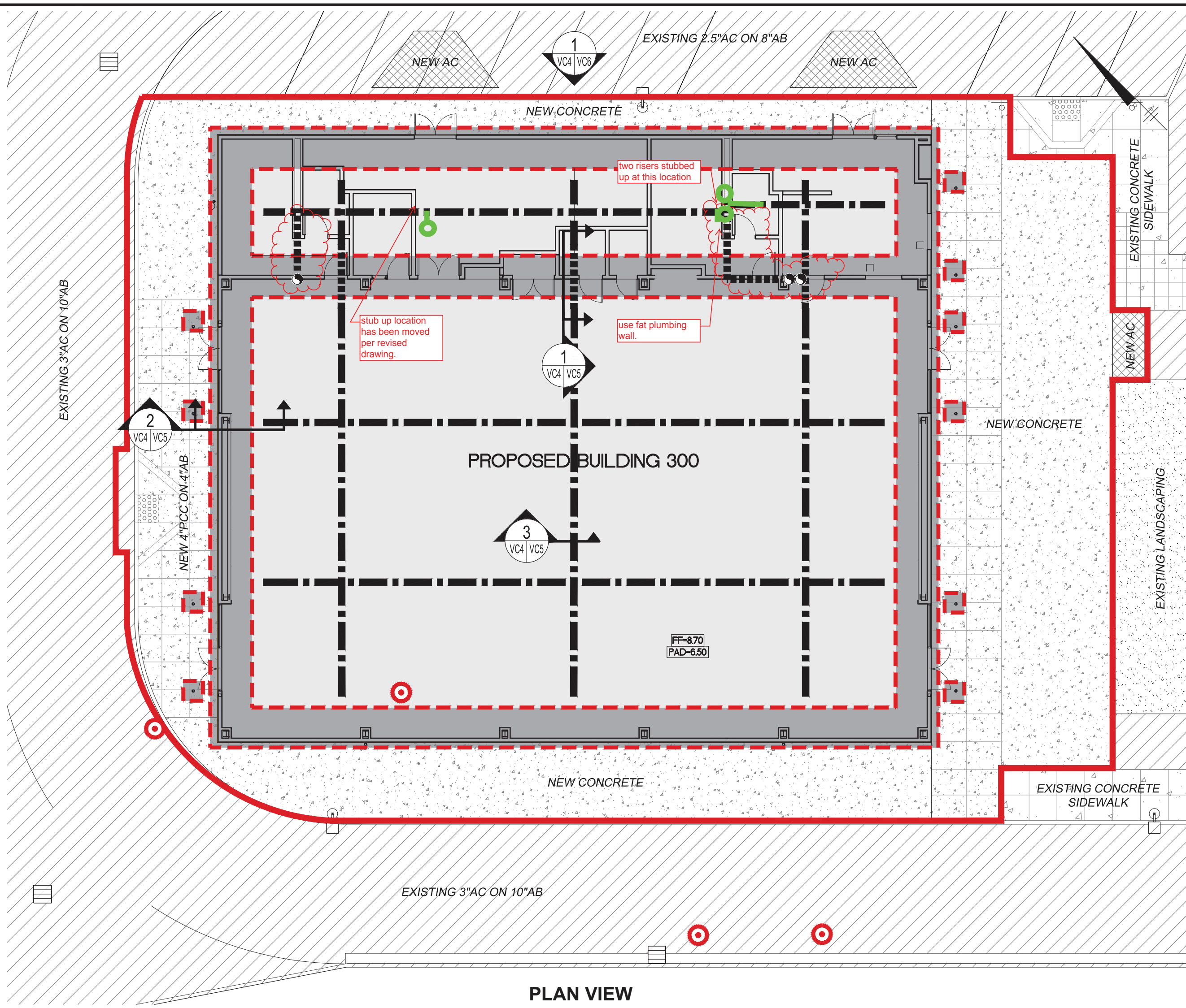
100 SMITH RANCH RD, STE 329
SAN RAFAEL, CA 94903
TEL. 415.491.4530

VC3



LEGEND

new Proposed location for interior Sch 40 PVC lateral and riser (location to be verified in the field by ASPIRE project engineer)

- LIMITS OF CAP MODIFICATION
- LIMITS OF PROPOSED BUILDING FOOTING FOUNDATIONS
- LIMITS OF PROPOSED CANOPY FOOTING
- SOIL SAMPLE FAILED PCB CRITERIA OF 0.130 mg/kg
- NEW CONCRETE SLAB (5" REINFORCED PCC ON 6" CLASS 2 AB ON 6" RECOMPACTED SUBGRADE (90□)) PER GEOTECHNICAL REPORT
- NEW CONCRETE SLAB (4" REINFORCED PCC ON 4" CLASS 2 AB ON 6" RECOMPACTED SUBGRADE (90□))
- NEW AC PAVEMENT (3" AC ON 6" CLASS 2 AB ON 6" RECOMPACTED SUBGRADE (95□)) PER GEOTECHNICAL REPORT
- E□ISTING CONCRETE PAVING TO REMAIN
- E□ISTING AC PAVING TO REMAIN
- E□ISTING LANDSCAPING TO REMAIN
- INTERIOR VENTILATION TRENCH CONTAINING VAPOR-VENT™ SOIL GAS COLLECTION SYSTEM
- INTERIOR SCH. 40 PVC PIPE
- E□TERIOR SCH. 40 PVC VENT RISER — sch. 80 on exterior locations
- mg/kg — MILLIGRAMS PER KILOGRAM

PLAN VIEW

0 □' 16'
APPRO□IMATE SCALE IN FEET

SOURCES:
UNDERWOOD □ ROSENBLUM, INC.
K2A ARCHITECTURE □ INTERIORS GRADING AND PAVING PLANS

SCALED AS INDICATED

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1	01/07/15	UPDATED PER K2A COMMENTS	EK	LG

Pro□essional Engineer's Name: LUCAS GOLDSTEIN
Pro□essional Engineer's No.: C72455

State	Date Signed	Project Mgr.
CA	11/03/14	EK
Designed by	**Drawn by**	**Checked by**
AK	AR/JLH	RS

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BUILDING 300 VAPOR COLLECTION SYSTEM LAYOUT

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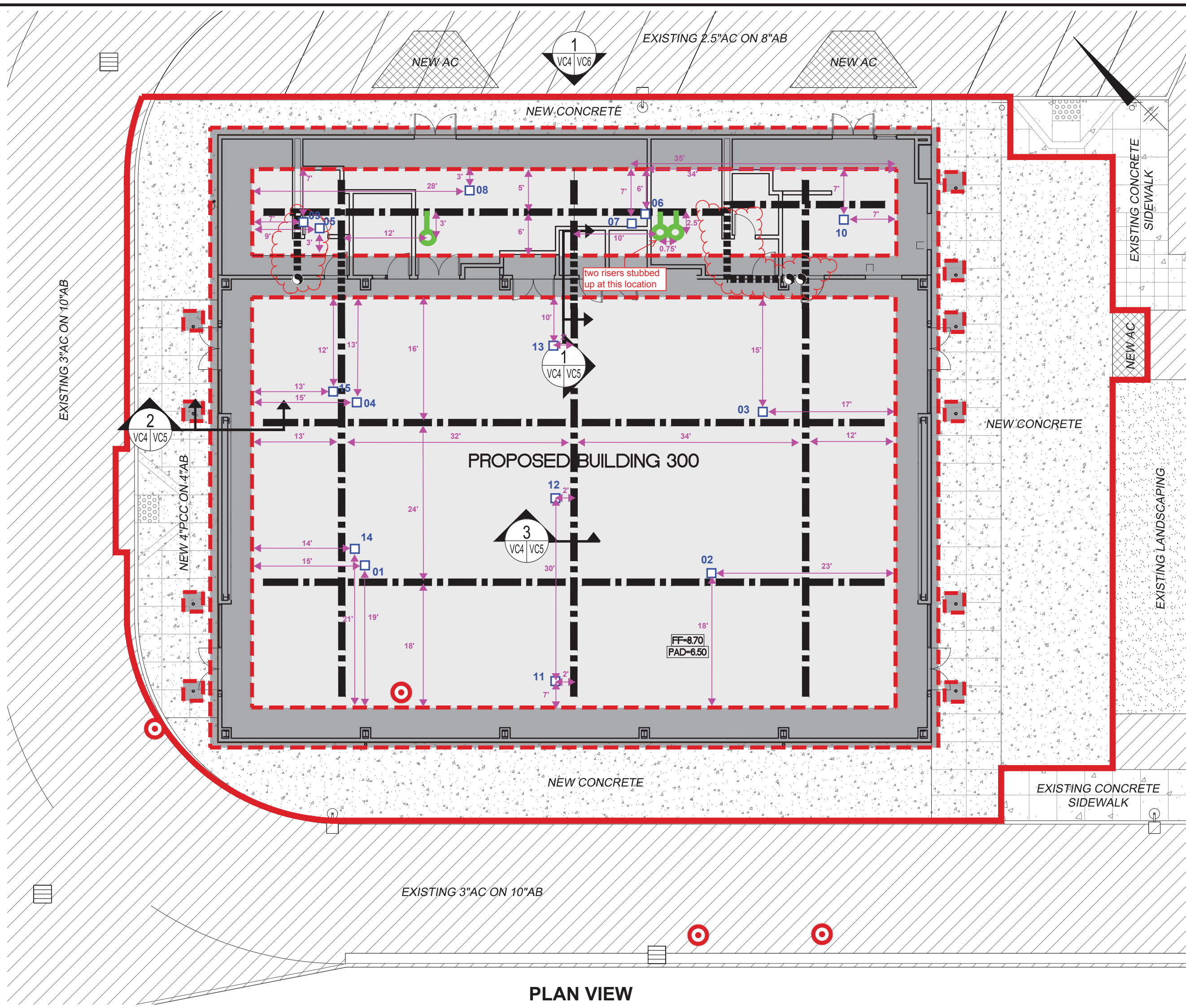
VC4



PLAN VIEW

0 16'
APPROXIMATE SCALE IN FEET

LEGEND

new Proposed location for interior Sch 40 PVC lateral and riser (location to be verified in the field by ASPIRE project engineer)

- LIMITS OF CAP MODIFICATION
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- SOIL SAMPLE FAILED PCB CRITERIA OF 0.130 mg/kg
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- INTERIOR SCH. 40 PVC PIPE
- EXTERIOR SCH. 40 PVC VENT RISER — sch. 80 on exterior locations
- mg/kg MILLIGRAMS PER KILOGRAM

02 — 3" Square Coupon Sample Collected

SOURCES:
UNDERWOOD & ROSENBLUM, INC.
K2A ARCHITECTURE – INTERIORS GRADING AND PAVING PLANS

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No.	Date	Revisions	By	Ckd
1	01/07/15	UPDATED PER K2A COMMENTS	EK	LG

Professional Engineer's Name: LUCAS GOLDSTEIN
Professional Engineer's No.: C72455
State: CA | Date Signed: 11/03/14 | Project Mgr.: EK
Designed by: AK | Drawn by: AR/JLH | Checked by: RS

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CONSTRUCTION

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Date NOVEMBER 2014
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100 SMITH RANCH RD, STE 329
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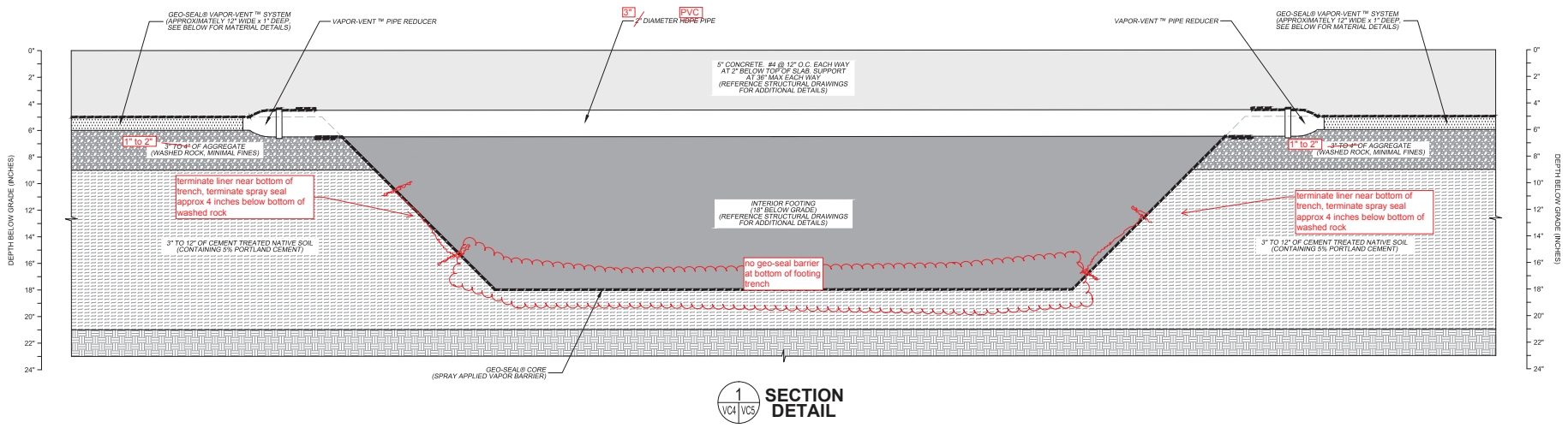
TEL. 415.491.4530

VC4



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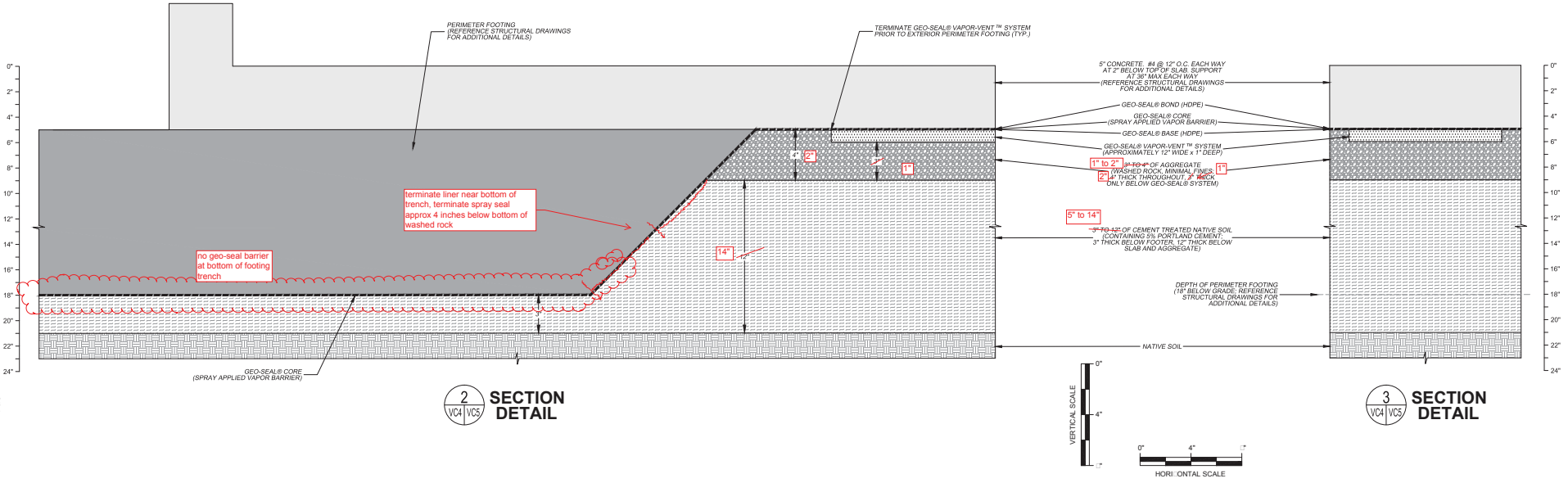

2 VC4 VC5 **SECTION DETAIL**

3 VC4 VC5 **SECTION DETAIL**

SCALED AS INDICATED

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No.	Date	Re: Isions	By	Ckd
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Professional Engineer's Name: **LUCAS GOLDSTEIN**
Professional Engineer's No.: C72455
State: CA | Date Signed: 11/03/14 | Project Mgr.: EK
Designed by: AK | Drawn by: AR/JLH | Checked by: RS

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PROPOSED CHARTER SCHOOL SITE • 1009 66TH AVENUE, OAKLAND, CALIFORNIA
CONSTRUCTION DOCUMENTS

BUILDING 300 VAPOR COLLECTION SECTION DETAILS

CONSTRUCTION

ARCADIS Project No. EM009155.0017.00001
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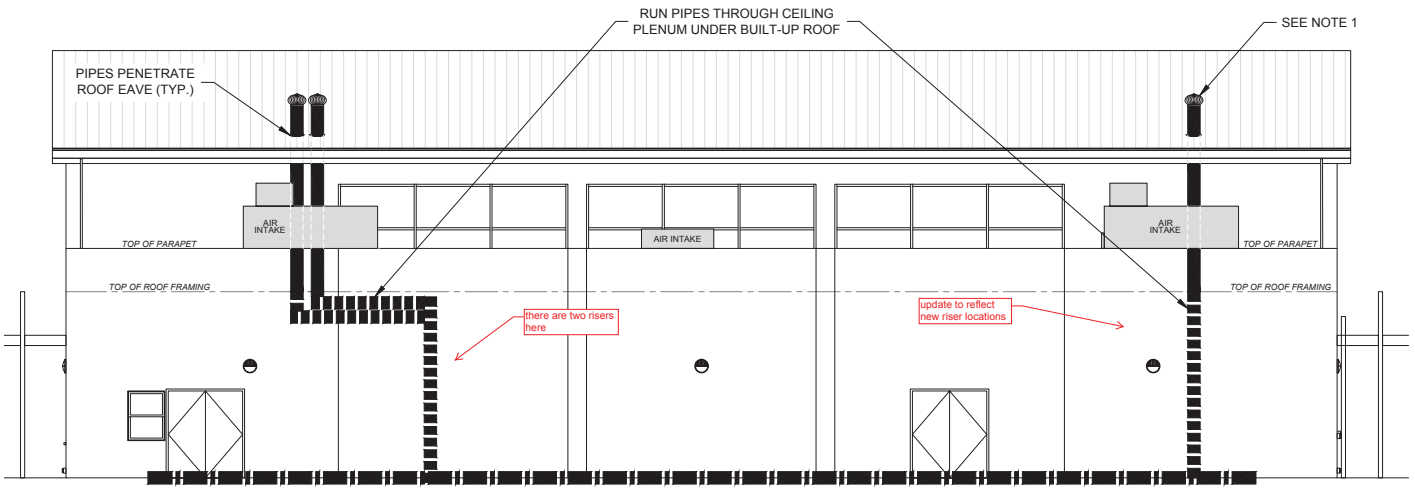
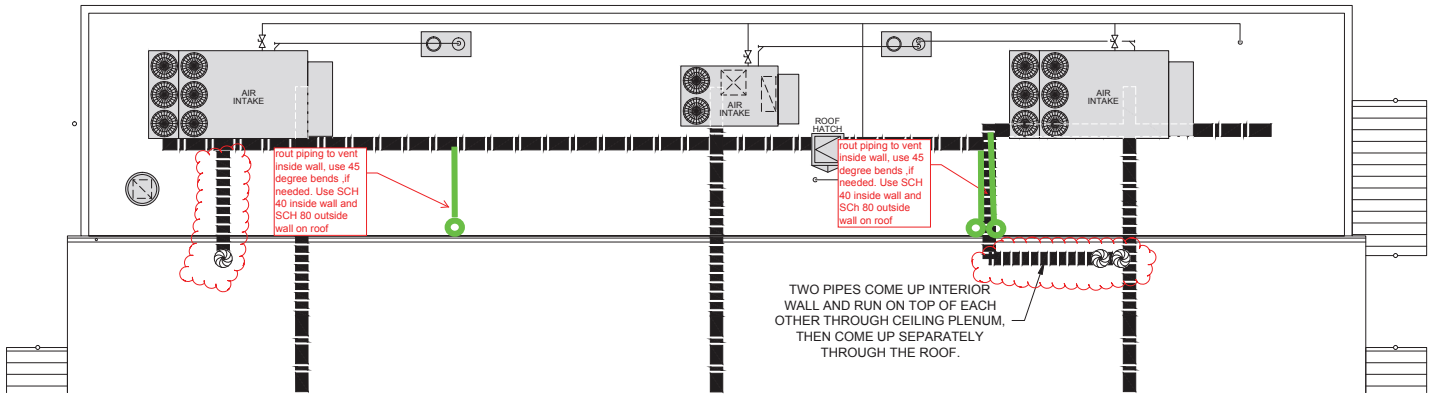
VC5



1 VC4 | VC6

NORTHEAST ELEVATION



ROOF PLAN VIEW

LEGEND

- SUBSLAB GEO-SEAL® VAPOR-VENT ™ SYSTEM
- INTERIOR SCH. 40 PVC VENT RISER
- E□TERIOR SCH. sch. 80 on exterior locations ER
- EMPIRE VENTILATOR TV04G WIND TURBINE WITH THRUST BEARINGS

NOTES:

1. NO STACK HEIGHT RE□UIREMENTS NEEDED AT THIS TIME, ADJUSTMENTS CAN BE MADE IN THE FIELD.
2. E□TERIOR PIPES MUST NOT OBSTRUCT ANY WINDOWS.

SOURCE:
K2A ARCHITECTURE □ INTERIORS GRADING AND PAVING PLANS

APPRO□IMATE SCALE IN FEET

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING: USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Re: isions	By	Ckd
1	01/07/15	UPDATED PER K2A COMMENTS	EK	LG

Pro□essional Engineer's Name: LUCAS GOLDSTEIN
Pro□essional Engineer's No.: C72455
State: CA | Date Signed: 11/03/14 | Project Mgr.: EK
Designed by: AK | Drawn by: AR/JLH | Checked by: RS

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CONSTRUCTION DOCUMENTS

BUILDING 300 VAPOR COLLECTION PIPE PENETRATION DETAILS

CONSTRUCTION

ARCADIS Project No. EM009155.0017.00001
Date NOVEMBER 2014

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VC6

CITY: EMERYVILLE,CA DIVGROUP: ENVCAD DB: A. REYES, J. HARRIS
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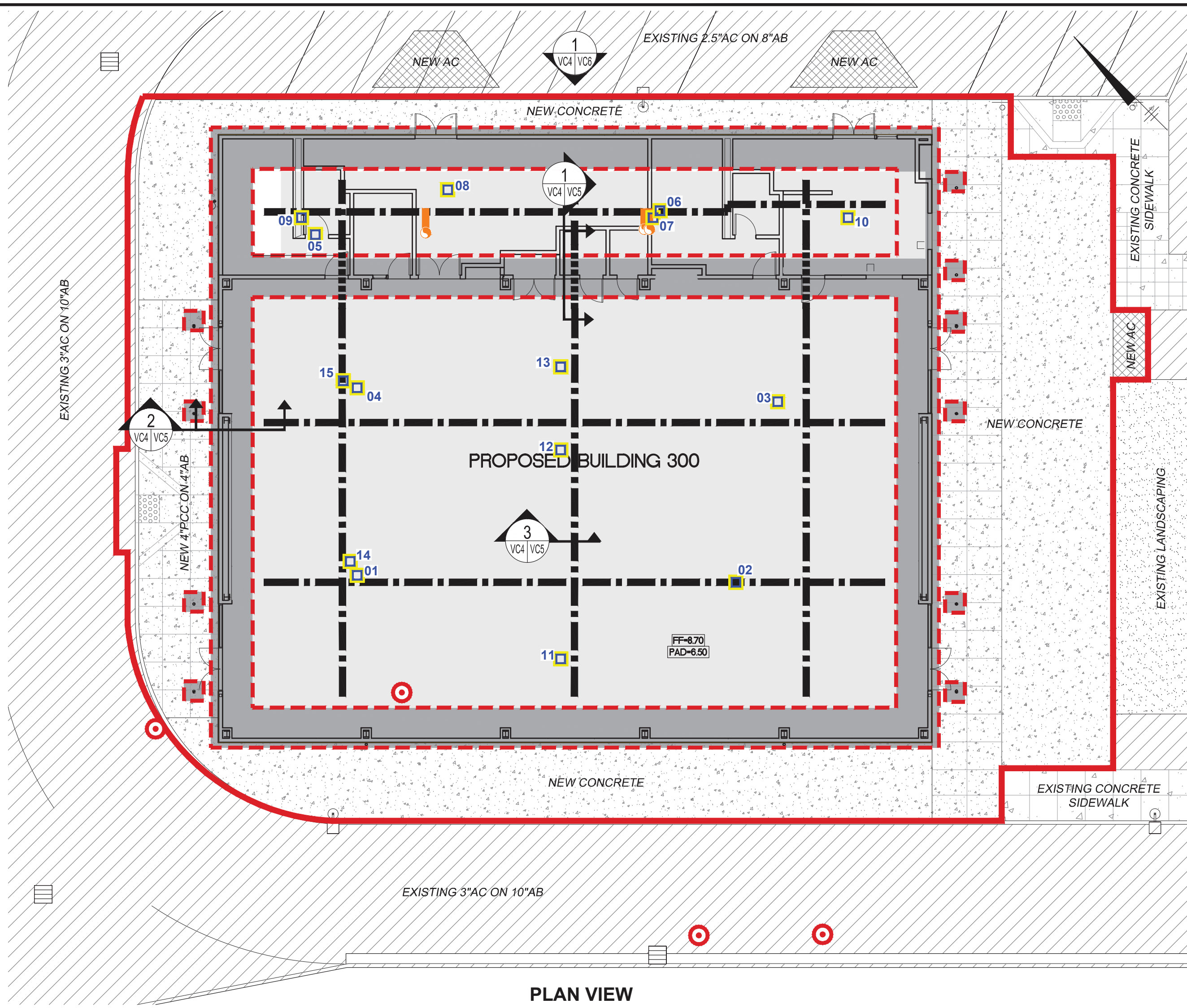

PLAN VIEW

0 8' 16'
APPROXIMATE SCALE IN FEET

LEGEND

- LIMITS OF CAP MODIFICATION
- LIMITS OF PROPOSED BUILDING FOOTING FOUNDATIONS
- LIMITS OF PROPOSED CANOPY FOOTING
- SOIL SAMPLE FAILED PCB CRITERIA OF 0.130 mg/kg
- 01 — 3" SQUARE COUPON SAMPLE COLLECTED
- NEW CONCRETE SLAB (5" REINFORCED PCC ON 6" CLASS 2 AB ON 6" RECOMPACTED SUBGRADE (90%)) PER GEOTECHNICAL REPORT
- NEW CONCRETE SLAB (4" REINFORCED PCC ON 4" CLASS 2 AB ON 6" RECOMPACTED SUBGRADE (90%))
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- EXISTING CONCRETE PAVING TO REMAIN
- EXISTING AC PAVING TO REMAIN
- EXISTING LANDSCAPING TO REMAIN
- INTERIOR VENTILATION TRENCH CONTAINING VAPOR-VENT™ SOIL GAS COLLECTION SYSTEM
- INTERIOR SCH. 40 PVC PIPE
- LOCATION FOR INTERIOR SCH. 40 PVC LATERAL AND EXTERIOR SCH. 80 PVC RISER (LOCATION TO BE VERIFIED IN THE FIELD BY ASPIRE ENGINEER)
- mg/kg — MILLIGRAMS PER KILOGRAM

AS-BUILT

PROPOSED CHARTER SCHOOL SITE
1009 66TH AVENUE
OAKLAND, CALIFORNIA

BUILDING 300 VAPOR COLLECTION SYSTEM LAYOUT

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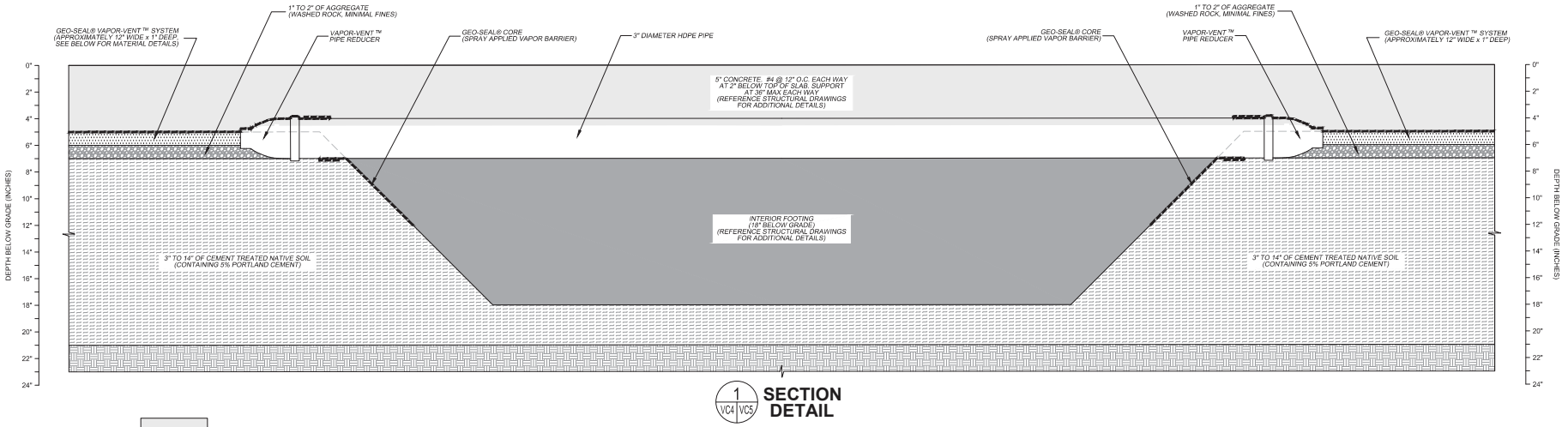
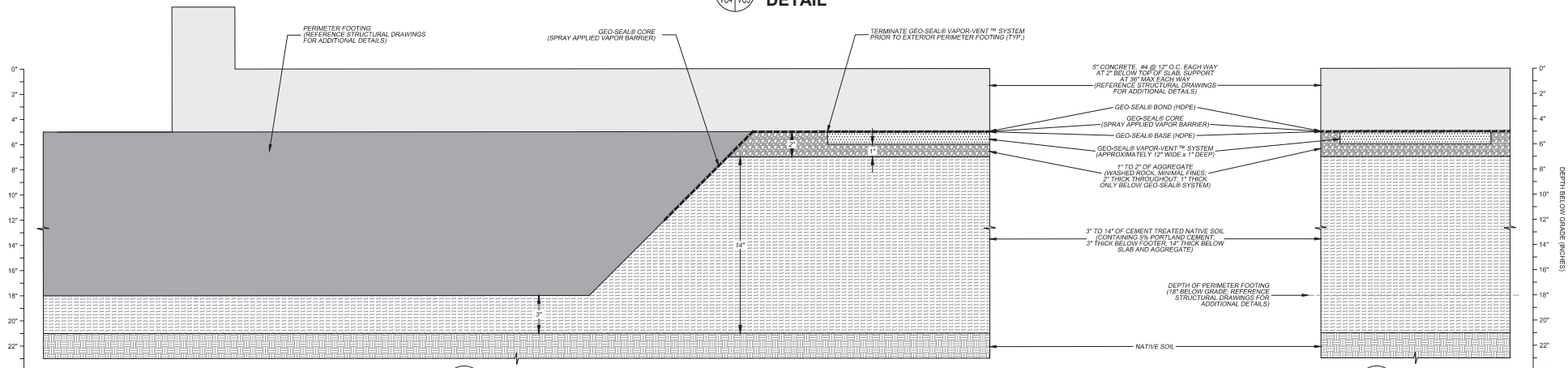
FIGURE
A-1



1 VC4 VC5 **SECTION DETAIL**



2 VC4 VC5 **SECTION DETAIL**

3 VC4 VC5 **SECTION DETAIL**

VERTICAL SCALE 0" 4" 8"

HORIZONTAL SCALE 0" 4" 8"

AS-BUILT

PROPOSED CHARTER SCHOOL SITE
1009 66TH AVENUE
OAKLAND, CALIFORNIA

BUILDING 300 VAPOR COLLECTION SECTION DETAILS

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FIGURE **A-2**

CITY: EMERYVILLE, CA DIV/GROUP: ENV/CAD DB: A. REYES, J. HARRIS
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Appendix **B**

Soil Vapor Sample Collection Logs

ARCADIS U.S., Inc.
2999 Oak Road
Suite 300
Walnut Creek
California 94597
Tel 925 274 1100
Fax 925 274 1103

MEMO

To:
ARCADIS Field Team

Copies:
Erica Kalve, ARCADIS

From:
Angeline Tan

Date:
July 30, 2015

ARCADIS Project No.:
EM009155.0017

Subject:
Building 300 Riser Sampling Plan Memorandum
Former Pacific Electric Motors Facility
1009 66th Avenue, Oakland, California

ARCADIS U.S., Inc. (ARCADIS) has prepared this Building 300 Riser Sampling Plan (plan) for the Former Pacific Electric Motors (PEM) Facility located at 1009 66th Avenue in Oakland, California ("the Site"; Figures 1). Alameda County Department of Environmental Health (ACEH) provided conditional approval of the Vapor Intrusion Mitigation (VIM) system design for the proposed gymnasium building (ARCADIS 2014c) in a letter dated January 8, 2015 (ACEH 2015a). As stated in the conditional approval letter, a determination on the adequacy of the VIM system to mitigate potential vapor intrusion will be based upon vapor and indoor air monitoring data collected after installation of the system.

On March 20, 2015 ARCADIS submitted to ACEH the Building 300 Vapor and Indoor Air Monitoring Plan that described procedures to establish baseline conditions in Building 300 following construction of the VIM system (Air Monitoring Plan; ARCADIS 2015). This plan is a supplement to the Air Monitoring Plan and provides detailed procedures to obtain grab air sampling from the riser pipes of the VIM system. The grab air samples will be used to compare with the indoor air samples collected as described in the Air Monitoring Plan (ARCADIS 2015) and to evaluate the effectiveness of the VIM system. Shortly after the submission of the March 20, 2015 Air Monitoring Plan, the floor plan of Building 300 was changed to accommodate the sanitary sewer. To accommodate the revised floor plan, the proposed indoor air sample locations were also changed. A revised figure is included as Figure 3.

Purpose of Riser Pipe Sampling

The purpose of sampling the riser pipe is to evaluate the effectiveness of the VIM system. The results of the riser pipe samples will not be screened against any indoor air/outdoor air criteria. Instead the riser pipe

samples will provide a basis of comparison with the indoor air samples to evaluate whether the VIM system is effective in reducing VOC concentrations and whether additional steps were necessary to ensure effective vapor mitigation.

Riser Pipe Sampling Plan

The 4-inch diameter riser pipe at the roof level will be installed with a ball valve. A sample port will be drilled and tapped into the riser pipe below the ball valve. Figure 2 shows the schematic of the ball valve and sample port.

There are three riser pipes that extend from the vent pipes (GeoVent) to the roof level. One air sample will be collected from each riser pipe. Prior to sampling, two vacuum readings will be taken and recorded; one with the ball valve open; and one with the ball valve closed. After the ball valve is closed, a high volume gas pump (i.e., Gast 1532) will be used to purge the approximately one volume of air as calculated. The volume of air to purge will be calculated from the ground surface where it connects to the GeoVent to the ball valve at roof level).

Air samples will be collected in 6-liter stainless steel certified clean Summa canisters. Each 6-liter Summa canister will be equipped with a flow controller and flow restrictor that use a critical orifice to regulate the flow of air into the canister. The flow controllers will be checked by the laboratory to verify air flow for each canister is set at the appropriate rate for the collection of the grab samples. The canister will be pre-evacuated by the laboratory to approximately -30 inches of mercury (Hg). Grab samples will be collected over a 30-minute period from the effluent sampling ports.

To ensure that the collected samples will meet the planned end use for this study, the following sample guidelines will be followed:

- If the initial vacuum gauge reads less than 26 inches of Hg, the canister will be replaced prior to sample collection.
- If the canister is not under vacuum, the sample will be considered a grab sample.
- If the final vacuum gauge reads greater than 20 inches of Hg, the sample will be rejected.

Samples will be analyzed using a low-level TO-15 Selected Ion Monitoring (SIM) analytical method for VOCs following the procedures discussed below.

<u>Sampling Procedure</u>

To start the sampling event:

1. Place the canister in the proper location (i.e., 3 to 5 feet above ground surface for breathing zone samples and ground surface for pathways samples).

2. Record the initial vacuum (approximately -30 inches of mercury [Hg]) of the canister on the air sampling log.

3. Using a wrench, remove the closing bolt on the top of the canister and attach the flow controller device, tighten with a wrench (with filter in-line), open the canister bellows valve, and note the start time. Start any co-located canisters at the same time.

To complete the sampling event:

1. Close the canister bellows valve and note the stop time on the air sampling log.

2. Using a wrench, detach the flow controller.

3. Replace the closing bolt on top of the canister and tighten with a wrench. Record the final vacuum of the canister on the air sampling log.

Sample Analyses

Similar to the Air Monitoring Plan, air samples will be transferred under strict chain-of-custody procedures to a California-certified laboratory and analyzed for Total petroleum hydrocarbons as gasoline, benzene, toluene, ethylbenzene, m,p-xylene, o-xylene, methyl tertiary-butyl ether, and naphthalene by USEPA Method TO-15 (SIM). All Summa canisters will be individually certified cleaned, rather than batch certified, by the laboratory prior to sample collection. Low-level selective ion monitoring (SIM) methods will be utilized to meet the necessary reporting limits for the data evaluation process.

The samples will be analyzed for low-level analysis; however, the actual analytical reporting limits for each sample may vary based on actual sample volume collected and any sample dilution required in the laboratory for canister pressurization and sample analysis pursuant to the laboratory analytical method.

Results of the riser pipe samples will be included in the summary report as outlined in the Air Monitoring Plan (ARCADIS 2015).

Attachments:

Figure 1 – Site Vicinity Map

Figure 2 – Sampling Port Details

Figure 3 – Revised Proposed Indoor Air Sample Locations

MAP SOURCE: Copyright 1995, Thomas Bros. Map ALAMEDA COUNTY 2002 Edition

0 2,000 4,000 FEET

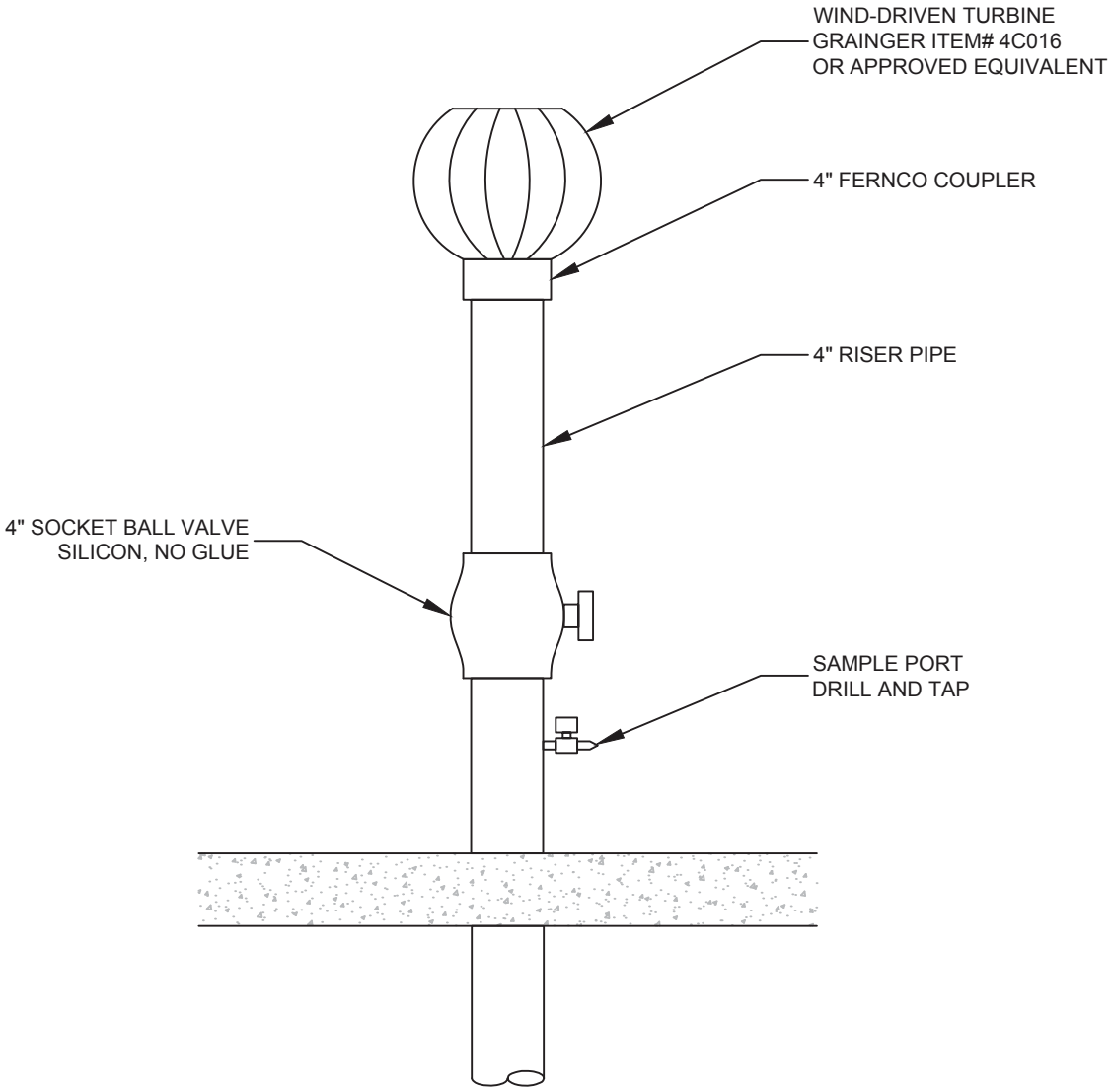
1009 66TH AVENUE, OAKLAND, CALIFORNIA

SITE VICINITY MAP

ARCADIS

FIGURE 1

DESIGN\003\09155\Figure 1 Site Vicinity - 003-09155.cdr



NOT TO SCALE

1. CLOSE BALL VALVE
2. PURGE WITH HIGH VOLUME GAST PUMP
3. COLLECT SAMPLE

PROPOSED CHARTER SCHOOL SITE
1009 66TH AVENUE, OAKLAND, CALIFORNIA

SAMPLING PORT DETAILS

ARCADIS

FIGURE
2

LEGEND

IA-01 ● PROPOSED INDOOR AIR SAMPLE LOCATION

NOTES:

1. SOURCE: K2A ARCHITECTURE
2. PROPOSED INDOOR AIR SAMPLE LOCATIONS ARE APPROXIMATE AND WILL VARY BASED ON ACTUAL FIELD CONDITIONS.

0 5' 10'
APPROXIMATE SCALE IN FEET

PROPOSED CHARTER SCHOOL SITE
1009 66TH AVENUE, OAKLAND, CALIFORNIA

REVISED PROPOSED INDOOR AIR SAMPLE LOCATIONS

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FIGURE
3

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TABLE 1
SOIL GAS SAMPLING FIELD DATA
Aspire College

Personnel: C McGeown Landfill Gas Meter: _____ Date: 9/14/15 – 9/15/15
Site: Aspire College Project Number: EM009155.0017.00001

Date	Sample ID	Canister ID	Regulator ID	Leak Test Start Time	Start Leak Vacuum Pressure (in-Hg)	Leak test stop time	End Leak Vacuum Pressure (in-Hg)	Start Purge Time	End Purge Time	Begin Sampling Time	Initial Vacuum (in-Hg)	End Sampling Time	Final Vacuum (in-Hg)	He Shroud Range (%)	He Detected (ppm)	TO-17 Volume Collected (mL)	TO-17 Collected Time	VOC (ppm)	CH_4 (%)	O_2 (%)	CO_2 (%)
9/14	IA-1	13654 →								0844	-30	1555	-6								
	IA-2	1056 →								0845	-30	1556	-7								
	IA-3	22498 →								0846	-30	1557	-6.5								
	IA-4	25312 →								0847	-30	1558	-7								
	IA-5	31430 →								0849	-30	1559	-7.5								
	IA-6	4387 →								0850	-30	1600	-7								
	OA-3	33869 →								0900	-30	1554	-6.5								
	OA-4	33897 →								0856	-30	1552	-7.5								
	DUP-1	6L1229								0845	-30	1556	-7								
	SVP-6	6L1254	30559	0930	-10	1010	-10	1055	1129	1137	-30	1223	-6.5	11.3-21.5	0.0	60	1236	11.1	0.1	16.1	4.3
	SVP-7	14873	30830	0931	-10	1010	-10	1230	1304	1307	-29.5	1353	-6.5	12.6-21.3	0.0	60	1353	0.2	0.0	9.7	2.1
	~~SVP-8*~~	~~12666~~	~~6470~~	~~0950~~	~~-10~~	~~1010~~	~~-10~~	→			-30										
	SVP-9*	6L1247	30968	0959	-10	1010	-10				-30										
	SVP-10*	34314	30940	1010	-10	1031	-10	1418			-30										
	R-1	12666	—	—	—	—	—	1543	1623	1633	-30	1650	0.0					0.0	0.0	10.0	0.0
	R-2	6L1247						1623	1704	1704	-30	1709	0.0					0.0	0.1	10.5	0.0
↓	R-3	34314						1704	1750	1750	-30	1755	0.0					0.0	0.0	11.5	0.0
9/15/15	SVP-8*	14117 →	30968	1405	-10	1420	-10	1415	1449		-30										

IA-2

TO-17
SVP-6 G0144325
SVP-7 G0153864

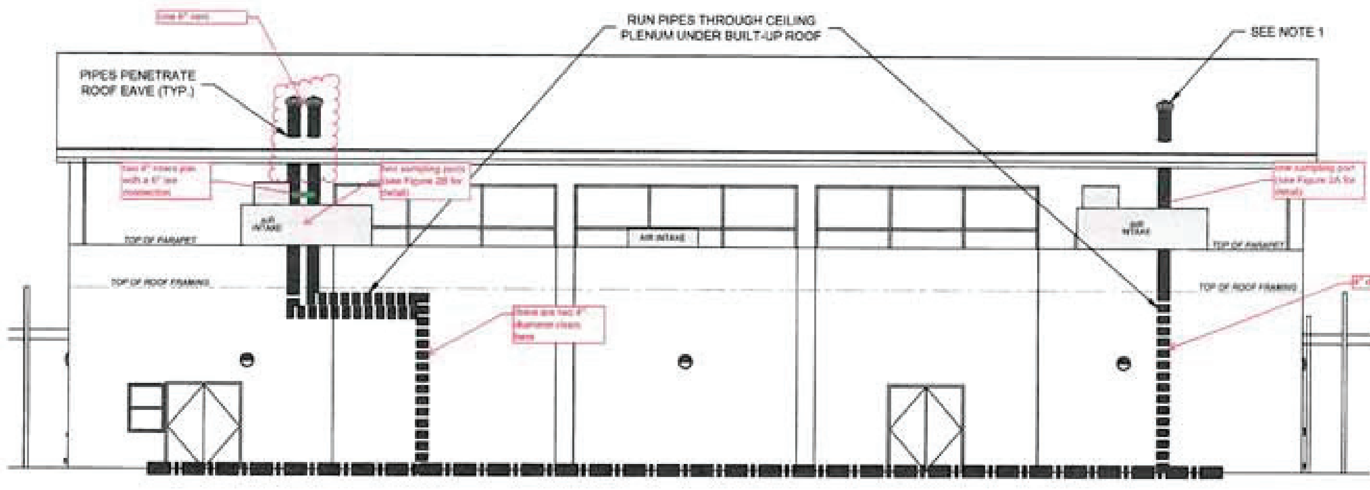
	Initial Pressure	Final
R-1	0.0002	0.0000
R-2	0.0000	0.0000
R-3	0.0000	0.0000

Bars

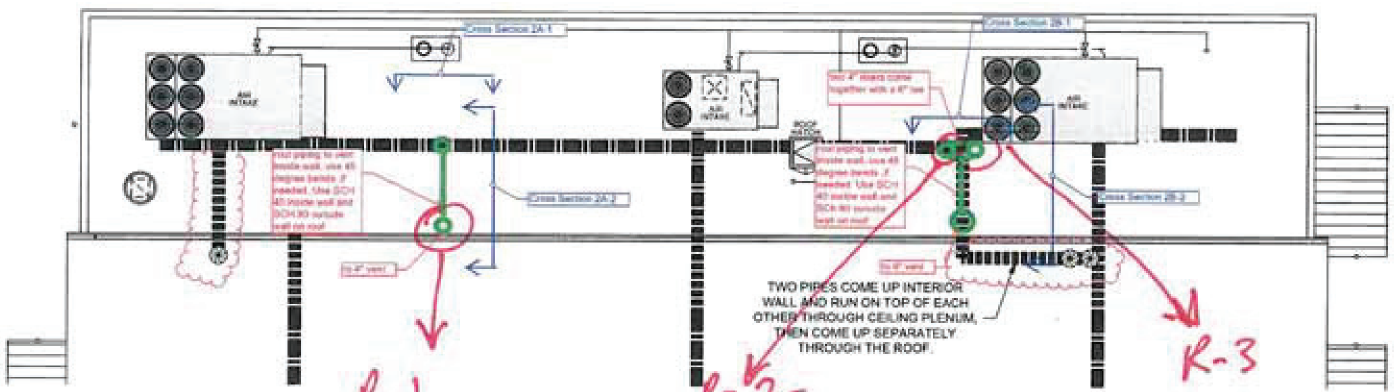
SVP-8* – vacuum of -17" Hg present on well side pressure (possible fouled probe or tight sandy ~~cannot locate, possibly lost due to construction activities / concrete resurfacing~~

SVP-10* – significant ft vacuum on well, no purge to volume extracted due to faults shorting Gil air-5 pump.

↳ SVP-9 → significant vacuum on well, no purge to volume extracted – not sampled



1 VC4 VC6 NORTHEAST ELEVATION



ROOF PLAN VIEW

LEGEND

- SUBSLAB GEO-SEAL® VAPOR-VENT ™ SYSTEM
- INTERIOR SCH. 40 PVC VENT RISER
- EXTERIOR SCH. R
- EMPIRE VENTILATOR TV04G WIND TURBINE WITH THRUST BEARINGS

NOTES:

1. NO STACK HEIGHT REQUIREMENTS NEEDED AT THIS TIME, ADJUSTMENTS CAN BE MADE IN THE FIELD.
2. EXTERIOR PIPES MUST NOT OBSTRUCT ANY WINDOWS.

SOURCE:
K2A ARCHITECTURE • INTERIORS GRADING AND PAVING PLANS

APPROXIMATE SCALE IN FEET

No.	Date	Revisions	By	Ckd
1		UPDATED PER K2A COMMENTS	EK	LG

Professional Engineer's Name: LUCAS GOLDSTEIN

Designed by: AK | Drawn by: ARLILH | Checked by: RS

ARCADIS

ARCADIS U.S., INC.

PROPOSED CHARTER SCHOOL SITE • 1009-66TH AVENUE, OAKLAND, CALIFORNIA

CONSTRUCTION DOCUMENTS

BUILDING 300 VAPOR COLLECTION PIPE PENETRATION DETAILS

CONSTRUCTION

Date: NOVEMBER 2014

ARCADIS
100 SMITH RANCH RD, STE 329
SAN RAFAEL, CA 94903

VC6

ARCADIS

Appendix **C**

Building Walkthrough Photo Log

Appendix C
Building 300 Walkthrough Photo Log
Aspire College
1009 66th Avenue
Oakland, California

Appendix C
Building 300 Walkthrough Photo Log
Aspire College
1009 66th Avenue
Oakland, California

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Building 300 Walkthrough Photo Log
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Oakland, California

Appendix C
Building 300 Walkthrough Photo Log
Aspire College
1009 66th Avenue
Oakland, California

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Appendix **D**

Laboratory Analytical Reports

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Sample Transportation Notice

Relinquishing signature on this document indicates that sample is being shipped in compliance with all applicable local, State, Federal, national, and international laws, regulations and ordinances of any kind. Air Toxics Limited assumes no liability with respect to the collection, handling or shipping of these samples. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Air Toxics Limited against any claim, demand, or action, of any kind, related to the collection, handling, or shipping of samples. D.O.T. Hotline (800) 467-4922

180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX (916) 985-1020

Project Manager: Kalve, Erica

Collected by: (Print and Sign) Cameron McLaren

Company: ARCADIS

Email: Erica.Kalve@arcadis.com

Address: 100 Smith Ranch Rd #320 City: San Rafael State: CA Zip: 94903

Phone: 510.206.4519 Fax:

Project Info:

P.O. #:

Project #: EM001155.0017

Project Name: Aspire College

Turn Around Time:

☐ Normal

☒ Rush 1-week (5 BD) specify

Lab Use Only: Pressurized by: Date: Pressurization Gas: N, He

Lab I.D.	Field Sample I.D. (Location)	Can #	Date of Collection	Time of Collection	Analyses Requested	Canister Pressure/Vacuum: Initial	Final	Receipt	Final (psig)
	IA-1 (1-week TAT)	13659	9/14/15	0844	70-15 (Sim)*	-30	-6		
	IA-2	1056		0845			-7		
	IA-3	22498		0846			-6.5		
	IA-4	25312		0847			-7		
	IA-5	31438		0849			-7.5		
	IA-6	4387		0850			-7		
	OA-3	30869		0900			-7.5		
	OA-4	33897		0855			-7.5		
	DUP-1	CA-1229		0845			-7		

Relinquished by: (signature) Cameron McLaren Date/Time: 9/16/15 1500

Received by: (signature) UPS FAT Date/Time: 9-17-15 1140

Relinquished by: (signature) Date/Time

Received by: (signature) Date/Time

Relinquished by: (signature) Date/Time

Received by: (signature) Date/Time

Notes: 70-15 (Sim)* = (BTE) mp-xylene, o-xylene, MTBE, TPHg, naphthalene, TPH-g (GC)

Lab Use Only: Shipper Name: FedEx | Air Bill #: | Temp (°C): NA | Condition: Good | Custody Seals Intact? Yes / No / (None) | Work Order #: 1509302

Form 1200 rev.1

eurofins | Air Toxics

Sample Transportation Notice
Relinquishing signature on this document indicates that sample is being shipped in compliance with all applicable local, State, Federal, national, and International laws, regulations and ordinances of any kind. Air Toxics Limited assumes no liability with respect to the collection, handling or shipping of these samples. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Air Toxics Limited against any claim, demand, or action, of any kind, related to the collection, handling, or shipping of samples. D.O.T. Hotline (800) 467-4922

180 BLUE RAVINE ROAD, SUITE B
FOLSOM, CA 95630-4719
(916) 985-1000 FAX (916) 985-1020

Project Manager _____

Collected by: (Print and Sign) Page #1

Company _____ Email _____

Address _____ City _____ State ____ Zip ____

Phone _____ Fax _____

Project Info:

P.O. # _____

Project # _____

Project Name Aspire College

Turn Around Time:

☐ Normal

☒ Rush 1-week specify

(Lab Use Only)
Pressurized by:
Date:
Pressurization Gas: N2 He

Lab I.D.	Field Sample I.D. (Location)	Can #	Date of Collection	Time of Collection	Analyses Requested	Canister Pressure/Vacuum Initial	Final	Receipt (PSI)	Final (PSI)
	SVP-6 [Std TAT]	6L1254	9/14/15	1137	TO-15* + ASTM 1946	-30	-6.5		
	SVP-7	14873		1307	↓	-29.5	-6.5		
	R-1 [1-week TAT]	12666		1633	TO-15 (SIM)*	-30	0		
	R-2	6L1247		1704	↓	-30	0		
	R-3	3994		1750	↓	-30	0		

Relinquished by: (signature) Date/Time 9/15 1500

Received by: (signature) Date/Time 9-15-15 1140

Relinquished by: (signature) Date/Time

Received by: (signature) Date/Time

Notes:
TO-15 (SIM)* = TPHg, benzene, toluene, ethylbenzene, m&p-xylene, o-xylene, MTBE, naphthalene
ASTM 1946 = CH_4, O_2, CO_2, H_2

Lab Use Only	Shipper Name	Air Bill #	Temp (°C)	Condition	Custody Seals Intact?	Work Order #
	FedEx		NR	Good	Yes No (None)	15093-2

Form 1298 rev.11

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9/25/2015
Ms. Angeline Tan
Arcadis U.S., Inc.
2999 Oak Road
Suite 300
Walnut Creek CA 94597

Project Name: Aspire College
Project #: EM009155.0017
Workorder #: 1509302A

Dear Ms. Angeline Tan

The following report includes the data for the above referenced project for sample(s) received on 9/18/2015 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-15 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 the Project Manager: Kelly Buettner at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Kelly Buettner

Project Manager

eurofins | Air Toxics

WORK ORDER #: 1509302A

Work Order Summary

CLIENT:	Ms. Angeline Tan Arcadis U.S., Inc. 2999 Oak Road Suite 300 Walnut Creek, CA 94597	**BILL TO:**	Accounts Payable Arcadis U.S., Inc. 630 Plaza Drive Suite 600 Highlands Ranch, CO 80129
PHONE:	925-274-1100	**P.O. #**	EM009155.0017
FAX:	925-274-1103	**PROJECT #**	EM009155.0017 Aspire College
DATE RECEIVED:	09/18/2015	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	09/25/2015		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	IA-1	Modified TO-15	5.3 "Hg	5 psi
01B	IA-1	Modified TO-15	5.3 "Hg	5 psi
02A	IA-2	Modified TO-15	6.5 "Hg	5.1 psi
02B	IA-2	Modified TO-15	6.5 "Hg	5.1 psi
03A	IA-3	Modified TO-15	5.9 "Hg	4.9 psi
03B	IA-3	Modified TO-15	5.9 "Hg	4.9 psi
04A	IA-4	Modified TO-15	6.1 "Hg	5 psi
04B	IA-4	Modified TO-15	6.1 "Hg	5 psi
05A	IA-5	Modified TO-15	7.1 "Hg	4.9 psi
05B	IA-5	Modified TO-15	7.1 "Hg	4.9 psi
06A	IA-6	Modified TO-15	5.3 "Hg	5.2 psi
06B	IA-6	Modified TO-15	5.3 "Hg	5.2 psi
07A	OA-3	Modified TO-15	6.7 "Hg	5 psi
07B	OA-3	Modified TO-15	6.7 "Hg	5 psi
08A	OA-4	Modified TO-15	6.9 "Hg	5.1 psi
08B	OA-4	Modified TO-15	6.9 "Hg	5.1 psi
09A	DUP-1	Modified TO-15	5.9 "Hg	4.9 psi
09B	DUP-1	Modified TO-15	5.9 "Hg	4.9 psi
12A	R-1	Modified TO-15	0.4 "Hg	5.1 psi
12B	R-1	Modified TO-15	0.4 "Hg	5.1 psi
13A	R-2	Modified TO-15	0.1 psi	4.9 psi
13B	R-2	Modified TO-15	0.1 psi	4.9 psi
14A	R-3	Modified TO-15	0.1 psi	4.9 psi

Continued on next page

eurofins | Air Toxics

WORK ORDER #: 1509302A

Work Order Summary

CLIENT:	Ms. Angeline Tan Arcadis U.S., Inc. 2999 Oak Road Suite 300 Walnut Creek, CA 94597	**BILL TO:**	Accounts Payable Arcadis U.S., Inc. 630 Plaza Drive Suite 600 Highlands Ranch, CO 80129
PHONE:	925-274-1100	**P.O. #**	EM009155.0017
FAX:	925-274-1103	**PROJECT #**	EM009155.0017 Aspire College
DATE RECEIVED:	09/18/2015	**CONTACT:**	Kelly Buettner
DATE COMPLETED:	09/25/2015		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
14B	R-3	Modified TO-15	0.1 psi	4.9 psi
15A	Lab Blank	Modified TO-15	NA	NA
15B	Lab Blank	Modified TO-15	NA	NA
15C	Lab Blank	Modified TO-15	NA	NA
15D	Lab Blank	Modified TO-15	NA	NA
16A	CCV	Modified TO-15	NA	NA
16B	CCV	Modified TO-15	NA	NA
16C	CCV	Modified TO-15	NA	NA
16D	CCV	Modified TO-15	NA	NA
17A	LCS	Modified TO-15	NA	NA
17AA	LCSD	Modified TO-15	NA	NA
17B	LCS	Modified TO-15	NA	NA
17BB	LCSD	Modified TO-15	NA	NA
17C	LCS	Modified TO-15	NA	NA
17CC	LCSD	Modified TO-15	NA	NA
17D	LCS	Modified TO-15	NA	NA
17DD	LCSD	Modified TO-15	NA	NA

CERTIFIED BY: Heidi Rayos DATE: 09/25/15

Technical Director

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

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 956
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified TO-15 Full Scan/SIM
Arcadis U.S., Inc.
Workorder# 1509302A

Twelve 6 Liter Summa Canister (SIM Certified) samples were received on September 18, 2015. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the Full Scan and SIM acquisition modes. The method involves concentrating up to 1.0 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis.

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

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

Requirement	***TO-15***	***ATL Modifications***
ICAL %RSD acceptance criteria	</=30% RSD with 2 compounds allowed out to < 40% RSD	For Full Scan: 30% RSD with 4 compounds allowed out to < 40% RSD For SIM: Project specific; default criteria is </=30% RSD with 10% of compounds allowed out to < 40% RSD
Daily Calibration	+- 30% Difference	For Full Scan: </= 30% Difference with four allowed out up to </=40%.; flag and narrate outliers For SIM: Project specific; default criteria is </= 30% Difference with 10% of compounds allowed out up to </=40%.; flag and narrate outliers
Blank and standards	Zero air	Nitrogen
Method Detection Limit	Follow 40CFR Pt.136 App. B	The MDL met all relevant requirements in Method TO-15 (statistical MDL less than the LOQ). The concentration of the spiked replicate may have exceeded 10X the calculated MDL in some cases

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

The results for each sample in this report were acquired from two separate data files originating from the same analytical run. The two data files have the same base file name and are differentiated with a "sim" extension on the SIM data file.

A single point calibration for TPH referenced to Gasoline was performed for each daily analytical batch. Recovery is reported as 100% in the associated results for each CCV.

Dilution was performed on samples R-2 and R-3 due to the presence of high level non-target species.

Definition of Data Qualifying Flags

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

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

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

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

N - The identification is based on presumptive evidence.

CN - See case narrative explanation

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

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

Client Sample ID: IA-1

Lab ID#: 1509302A-01A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
TPH ref. to Gasoline (MW=100)	16	31	67	130

Client Sample ID: IA-1

Lab ID#: 1509302A-01B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.082	0.084	0.26	0.27
Toluene	0.033	0.89	0.12	3.4
Ethyl Benzene	0.033	0.10	0.14	0.45
m,p-Xylene	0.065	0.41	0.28	1.8
o-Xylene	0.033	0.17	0.14	0.74

Client Sample ID: IA-2

Lab ID#: 1509302A-02A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
TPH ref. to Gasoline (MW=100)	17	32	70	130

Client Sample ID: IA-2

Lab ID#: 1509302A-02B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.086	0.087	0.27	0.28
Toluene	0.034	1.0	0.13	3.9
Ethyl Benzene	0.034	0.12	0.15	0.52
m,p-Xylene	0.069	0.48	0.30	2.1
o-Xylene	0.034	0.23	0.15	1.0

Client Sample ID: IA-3

Lab ID#: 1509302A-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)

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

Client Sample ID: IA-3

Lab ID#: 1509302A-03A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
TPH ref. to Gasoline (MW=100)	17	31	68	130

Client Sample ID: IA-3

Lab ID#: 1509302A-03B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.083	0.082 J	0.26	0.26 J
Toluene	0.033	1.2	0.12	4.4
Ethyl Benzene	0.033	0.12	0.14	0.52
m,p-Xylene	0.066	0.50	0.29	2.2
o-Xylene	0.033	0.22	0.14	0.95

Client Sample ID: IA-4

Lab ID#: 1509302A-04A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
TPH ref. to Gasoline (MW=100)	17	29	69	120

Client Sample ID: IA-4

Lab ID#: 1509302A-04B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Toluene	0.034	1.0	0.13	3.9
Ethyl Benzene	0.034	0.11	0.14	0.49
m,p-Xylene	0.067	0.44	0.29	1.9
o-Xylene	0.034	0.20	0.14	0.87

Client Sample ID: IA-5

Lab ID#: 1509302A-05A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
TPH ref. to Gasoline (MW=100)	18	23	72	94

eurofins | Air Toxics

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

Client Sample ID: IA-5

Lab ID#: 1509302A-05B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Toluene	0.035	0.64	0.13	2.4
Ethyl Benzene	0.035	0.12	0.15	0.50
m,p-Xylene	0.070	0.48	0.30	2.1
o-Xylene	0.035	0.18	0.15	0.77

Client Sample ID: IA-6

Lab ID#: 1509302A-06A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
TPH ref. to Gasoline (MW=100)	16	33	67	130

Client Sample ID: IA-6

Lab ID#: 1509302A-06B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.082	0.088	0.26	0.28
Toluene	0.033	0.95	0.12	3.6
Ethyl Benzene	0.033	0.12	0.14	0.54
m,p-Xylene	0.066	0.52	0.28	2.2
o-Xylene	0.033	0.20	0.14	0.86

Client Sample ID: OA-3

Lab ID#: 1509302A-07A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
TPH ref. to Gasoline (MW=100)	17	18	71	74

Client Sample ID: OA-3

Lab ID#: 1509302A-07B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Toluene	0.035	0.11	0.13	0.40

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

Client Sample ID: OA-4

Lab ID#: 1509302A-08A

No Detections Were Found.

Client Sample ID: OA-4

Lab ID#: 1509302A-08B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Toluene	0.035	0.10	0.13	0.39

Client Sample ID: DUP-1

Lab ID#: 1509302A-09A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
TPH ref. to Gasoline (MW=100)	17	51	68	210

Client Sample ID: DUP-1

Lab ID#: 1509302A-09B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Benzene	0.083	0.085	0.26	0.27
Toluene	0.033	0.91	0.12	3.4
Ethyl Benzene	0.033	0.11	0.14	0.49
m,p-Xylene	0.066	0.44	0.29	1.9
o-Xylene	0.033	0.20	0.14	0.86

Client Sample ID: R-1

Lab ID#: 1509302A-12A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
TPH ref. to Gasoline (MW=100)	14	2200	56	9000

Client Sample ID: R-1

Lab ID#: 1509302A-12B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)

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

Client Sample ID: R-1

Lab ID#: 1509302A-12B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methyl tert-butyl ether	0.14	0.31	0.49	1.1
Benzene	0.068	0.93	0.22	3.0
Toluene	0.027	1.4	0.10	5.5
Ethyl Benzene	0.027	0.72	0.12	3.1
m,p-Xylene	0.054	1.1	0.24	4.8
o-Xylene	0.027	0.80	0.12	3.5

Client Sample ID: R-2

Lab ID#: 1509302A-13A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
TPH ref. to Gasoline (MW=100)	26	3300	110	13000

Client Sample ID: R-2

Lab ID#: 1509302A-13B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methyl tert-butyl ether	0.26	0.82	0.95	3.0
Benzene	0.13	1.2	0.42	3.9
Toluene	0.053	1.6	0.20	6.2
Ethyl Benzene	0.053	1.3	0.23	5.6
m,p-Xylene	0.10	0.57	0.46	2.5
o-Xylene	0.053	1.0	0.23	4.5

Client Sample ID: R-3

Lab ID#: 1509302A-14A

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
TPH ref. to Gasoline (MW=100)	26	3900	110	16000

Client Sample ID: R-3

Lab ID#: 1509302A-14B

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

Client Sample ID: R-3

Lab ID#: 1509302A-14B

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methyl tert-butyl ether	0.26	3.6	0.95	13
Benzene	0.13	1.8	0.42	5.6
Toluene	0.053	2.0	0.20	7.5
Ethyl Benzene	0.053	1.4	0.23	6.1
m,p-Xylene	0.10	0.96	0.46	4.2
o-Xylene	0.053	0.91	0.23	4.0

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Client Sample ID: IA-1

Lab ID#: 1509302A-01A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**e092112**	**Date of Collection: 9/14/15 8:44:00 AM**	
Dil. Factor:	**1.63**	**Date of Analysis: 9/21/15 07:35 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Naphthalene	0.82	Not Detected	4.3	Not Detected
TPH ref. to Gasoline (MW=100)	16	31	67	130

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	98	70-130
Toluene-d8	97	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: IA-1

Lab ID#: 1509302A-01B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**e092112sim**	**Date of Collection: 9/14/15 8:44:00 AM**	
Dil. Factor:	**1.63**	**Date of Analysis: 9/21/15 07:35 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methyl tert-butyl ether	0.16	Not Detected	0.59	Not Detected
Benzene	0.082	0.084	0.26	0.27
Toluene	0.033	0.89	0.12	3.4
Ethyl Benzene	0.033	0.10	0.14	0.45
m,p-Xylene	0.065	0.41	0.28	1.8
o-Xylene	0.033	0.17	0.14	0.74

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: IA-2

Lab ID#: 1509302A-02A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**e092113**	**Date of Collection: 9/14/15 8:45:00 AM**	
Dil. Factor:	**1.72**	**Date of Analysis: 9/21/15 08:17 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Naphthalene	0.86	Not Detected	4.5	Not Detected
TPH ref. to Gasoline (MW=100)	17	32	70	130

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	94	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: IA-2

Lab ID#: 1509302A-02B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**e092113sim**	**Date of Collection: 9/14/15 8:45:00 AM**	
Dil. Factor:	**1.72**	**Date of Analysis: 9/21/15 08:17 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methyl tert-butyl ether	0.17	Not Detected	0.62	Not Detected
Benzene	0.086	0.087	0.27	0.28
Toluene	0.034	1.0	0.13	3.9
Ethyl Benzene	0.034	0.12	0.15	0.52
m,p-Xylene	0.069	0.48	0.30	2.1
o-Xylene	0.034	0.23	0.15	1.0

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: IA-3

Lab ID#: 1509302A-03A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**e092114**	**Date of Collection: 9/14/15 8:46:00 AM**	
Dil. Factor:	**1.66**	**Date of Analysis: 9/21/15 09:01 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Naphthalene	0.83	Not Detected	4.4	Not Detected
TPH ref. to Gasoline (MW=100)	17	31	68	130

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	96	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: IA-3

Lab ID#: 1509302A-03B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**e092114sim**	**Date of Collection: 9/14/15 8:46:00 AM**	
Dil. Factor:	**1.66**	**Date of Analysis: 9/21/15 09:01 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methyl tert-butyl ether	0.17	Not Detected	0.60	Not Detected
Benzene	0.083	0.082 J	0.26	0.26 J
Toluene	0.033	1.2	0.12	4.4
Ethyl Benzene	0.033	0.12	0.14	0.52
m,p-Xylene	0.066	0.50	0.29	2.2
o-Xylene	0.033	0.22	0.14	0.95

J = Estimated value.

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: IA-4

Lab ID#: 1509302A-04A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**e092115**	**Date of Collection: 9/14/15 8:47:00 AM**	
Dil. Factor:	**1.68**	**Date of Analysis: 9/21/15 10:01 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Naphthalene	0.84	Not Detected	4.4	Not Detected
TPH ref. to Gasoline (MW=100)	17	29	69	120

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	97	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: IA-4

Lab ID#: 1509302A-04B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**e092115sim**	**Date of Collection: 9/14/15 8:47:00 AM**	
Dil. Factor:	**1.68**	**Date of Analysis: 9/21/15 10:01 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methyl tert-butyl ether	0.17	Not Detected	0.60	Not Detected
Benzene	0.084	Not Detected	0.27	Not Detected
Toluene	0.034	1.0	0.13	3.9
Ethyl Benzene	0.034	0.11	0.14	0.49
m,p-Xylene	0.067	0.44	0.29	1.9
o-Xylene	0.034	0.20	0.14	0.87

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: IA-5

Lab ID#: 1509302A-05A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**e092116**	**Date of Collection: 9/14/15 8:49:00 AM**	
Dil. Factor:	**1.75**	**Date of Analysis: 9/21/15 10:53 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Naphthalene	0.88	Not Detected	4.6	Not Detected
TPH ref. to Gasoline (MW=100)	18	23	72	94

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	97	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: IA-5

Lab ID#: 1509302A-05B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**e092116sim**	**Date of Collection: 9/14/15 8:49:00 AM**	
Dil. Factor:	**1.75**	**Date of Analysis: 9/21/15 10:53 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methyl tert-butyl ether	0.18	Not Detected	0.63	Not Detected
Benzene	0.088	Not Detected	0.28	Not Detected
Toluene	0.035	0.64	0.13	2.4
Ethyl Benzene	0.035	0.12	0.15	0.50
m,p-Xylene	0.070	0.48	0.30	2.1
o-Xylene	0.035	0.18	0.15	0.77

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	101	70-130

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Client Sample ID: IA-6

Lab ID#: 1509302A-06A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**e092117**	**Date of Collection: 9/14/15 8:50:00 AM**	
Dil. Factor:	**1.64**	**Date of Analysis: 9/22/15 08:16 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Naphthalene	0.82	Not Detected	4.3	Not Detected
TPH ref. to Gasoline (MW=100)	16	33	67	130

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	97	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	103	70-130

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Client Sample ID: IA-6

Lab ID#: 1509302A-06B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**e092117sim**	**Date of Collection: 9/14/15 8:50:00 AM**	
Dil. Factor:	**1.64**	**Date of Analysis: 9/22/15 08:16 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methyl tert-butyl ether	0.16	Not Detected	0.59	Not Detected
Benzene	0.082	0.088	0.26	0.28
Toluene	0.033	0.95	0.12	3.6
Ethyl Benzene	0.033	0.12	0.14	0.54
m,p-Xylene	0.066	0.52	0.28	2.2
o-Xylene	0.033	0.20	0.14	0.86

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	102	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	103	70-130

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Client Sample ID: OA-3

Lab ID#: 1509302A-07A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**e092118**	**Date of Collection: 9/14/15 9:00:00 AM**	
Dil. Factor:	**1.73**	**Date of Analysis: 9/22/15 08:57 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Naphthalene	0.86	Not Detected	4.5	Not Detected
TPH ref. to Gasoline (MW=100)	17	18	71	74

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	106	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	95	70-130

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Client Sample ID: OA-3

Lab ID#: 1509302A-07B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**e092118sim**	**Date of Collection: 9/14/15 9:00:00 AM**	
Dil. Factor:	**1.73**	**Date of Analysis: 9/22/15 08:57 AM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methyl tert-butyl ether	0.17	Not Detected	0.62	Not Detected
Benzene	0.086	Not Detected	0.28	Not Detected
Toluene	0.035	0.11	0.13	0.40
Ethyl Benzene	0.035	Not Detected	0.15	Not Detected
m,p-Xylene	0.069	Not Detected	0.30	Not Detected
o-Xylene	0.035	Not Detected	0.15	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	103	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	99	70-130

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Client Sample ID: OA-4

Lab ID#: 1509302A-08A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20092308**	**Date of Collection: 9/14/15 8:55:00 AM**	
Dil. Factor:	**1.75**	**Date of Analysis: 9/23/15 02:15 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Naphthalene	0.88	Not Detected	4.6	Not Detected
TPH ref. to Gasoline (MW=100)	18	Not Detected	72	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	118	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	91	70-130

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Client Sample ID: OA-4

Lab ID#: 1509302A-08B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20092308sim**	**Date of Collection: 9/14/15 8:55:00 AM**	
Dil. Factor:	**1.75**	**Date of Analysis: 9/23/15 02:15 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methyl tert-butyl ether	0.18	Not Detected	0.63	Not Detected
Benzene	0.088	Not Detected	0.28	Not Detected
Toluene	0.035	0.10	0.13	0.39
Ethyl Benzene	0.035	Not Detected	0.15	Not Detected
m,p-Xylene	0.070	Not Detected	0.30	Not Detected
o-Xylene	0.035	Not Detected	0.15	Not Detected

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	118	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	93	70-130

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Client Sample ID: DUP-1

Lab ID#: 1509302A-09A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20092309**	**Date of Collection: 9/14/15 8:45:00 AM**	
Dil. Factor:	**1.66**	**Date of Analysis: 9/23/15 02:54 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Naphthalene	0.83	Not Detected	4.4	Not Detected
TPH ref. to Gasoline (MW=100)	17	51	68	210

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	115	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	96	70-130

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Client Sample ID: DUP-1

Lab ID#: 1509302A-09B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20092309sim**	**Date of Collection:**	**9/14/15 8:45:00 AM**
Dil. Factor:	**1.66**	**Date of Analysis:**	**9/23/15 02:54 PM**

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methyl tert-butyl ether	0.17	Not Detected	0.60	Not Detected
Benzene	0.083	0.085	0.26	0.27
Toluene	0.033	0.91	0.12	3.4
Ethyl Benzene	0.033	0.11	0.14	0.49
m,p-Xylene	0.066	0.44	0.29	1.9
o-Xylene	0.033	0.20	0.14	0.86

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	115	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	95	70-130

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Client Sample ID: R-1

Lab ID#: 1509302A-12A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20092310**	**Date of Collection: 9/14/15 4:33:00 PM**	
Dil. Factor:	**1.36**	**Date of Analysis: 9/23/15 03:33 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Naphthalene	0.68	Not Detected	3.6	Not Detected
TPH ref. to Gasoline (MW=100)	14	2200	56	9000

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	115	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	102	70-130

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Client Sample ID: R-1

Lab ID#: 1509302A-12B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20092310sim**	**Date of Collection: 9/14/15 4:33:00 PM**	
Dil. Factor:	**1.36**	**Date of Analysis: 9/23/15 03:33 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methyl tert-butyl ether	0.14	0.31	0.49	1.1
Benzene	0.068	0.93	0.22	3.0
Toluene	0.027	1.4	0.10	5.5
Ethyl Benzene	0.027	0.72	0.12	3.1
m,p-Xylene	0.054	1.1	0.24	4.8
o-Xylene	0.027	0.80	0.12	3.5

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	120	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	105	70-130

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Client Sample ID: R-2

Lab ID#: 1509302A-13A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20092311**	**Date of Collection: 9/14/15 5:04:00 PM**	
Dil. Factor:	**2.64**	**Date of Analysis: 9/23/15 04:23 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Naphthalene	1.3	Not Detected	6.9	Not Detected
TPH ref. to Gasoline (MW=100)	26	3300	110	13000

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	106	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	105	70-130

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Client Sample ID: R-2

Lab ID#: 1509302A-13B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20092311sim**	**Date of Collection: 9/14/15 5:04:00 PM**	
Dil. Factor:	**2.64**	**Date of Analysis: 9/23/15 04:23 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methyl tert-butyl ether	0.26	0.82	0.95	3.0
Benzene	0.13	1.2	0.42	3.9
Toluene	0.053	1.6	0.20	6.2
Ethyl Benzene	0.053	1.3	0.23	5.6
m,p-Xylene	0.10	0.57	0.46	2.5
o-Xylene	0.053	1.0	0.23	4.5

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	111	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	107	70-130

eurofins | Air Toxics

Client Sample ID: R-3

Lab ID#: 1509302A-14A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20092312**	**Date of Collection: 9/14/15 5:50:00 PM**	
Dil. Factor:	**2.64**	**Date of Analysis: 9/23/15 05:37 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Naphthalene	1.3	Not Detected	6.9	Not Detected
TPH ref. to Gasoline (MW=100)	26	3900	110	16000

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	109	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	104	70-130

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Client Sample ID: R-3

Lab ID#: 1509302A-14B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20092312sim**	**Date of Collection: 9/14/15 5:50:00 PM**	
Dil. Factor:	**2.64**	**Date of Analysis: 9/23/15 05:37 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methyl tert-butyl ether	0.26	3.6	0.95	13
Benzene	0.13	1.8	0.42	5.6
Toluene	0.053	2.0	0.20	7.5
Ethyl Benzene	0.053	1.4	0.23	6.1
m,p-Xylene	0.10	0.96	0.46	4.2
o-Xylene	0.053	0.91	0.23	4.0

Container Type: 6 Liter Summa Canister (SIM Certified)

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	113	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	108	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1509302A-15A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**e092111a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/21/15 06:28 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Naphthalene	0.50	Not Detected	2.6	Not Detected
TPH ref. to Gasoline (MW=100)	10	Not Detected	41	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	92	70-130
Toluene-d8	102	70-130
4-Bromofluorobenzene	97	70-130

eurofins | Air Toxics

Client Sample ID: Lab Blank

Lab ID#: 1509302A-15B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**e092111sima**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/21/15 06:28 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methyl tert-butyl ether	0.10	Not Detected	0.36	Not Detected
Benzene	0.050	Not Detected	0.16	Not Detected
Toluene	0.020	Not Detected	0.075	Not Detected
Ethyl Benzene	0.020	Not Detected	0.087	Not Detected
m,p-Xylene	0.040	Not Detected	0.17	Not Detected
o-Xylene	0.020	Not Detected	0.087	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	98	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	97	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1509302A-15C

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20092307a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/23/15 01:20 PM**	

Compound	**Rpt. Limit (ppbv)**	**Amount (ppbv)**	**Rpt. Limit (ug/m3)**	**Amount (ug/m3)**
Naphthalene	0.50	Not Detected	2.6	Not Detected
TPH ref. to Gasoline (MW=100)	10	Not Detected	41	Not Detected

Container Type: NA - Not Applicable

Surrogates	**%Recovery**	**Method Limits**
1,2-Dichloroethane-d4	115	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	90	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1509302A-15D

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20092307sima**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/23/15 01:20 PM**	

Compound	Rpt. Limit (ppbv)	Amount (ppbv)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Methyl tert-butyl ether	0.10	Not Detected	0.36	Not Detected
Benzene	0.050	Not Detected	0.16	Not Detected
Toluene	0.020	Not Detected	0.075	Not Detected
Ethyl Benzene	0.020	Not Detected	0.087	Not Detected
m,p-Xylene	0.040	Not Detected	0.17	Not Detected
o-Xylene	0.020	Not Detected	0.087	Not Detected

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	114	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	92	70-130

eurofins | Air Toxics

Client Sample ID: CCV

Lab ID#: 1509302A-16A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**e092102**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/21/15 09:35 AM**	

Compound	%Recovery
Naphthalene	95
TPH ref. to Gasoline (MW=100)	100

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	104	70-130

eurofins | Air Toxics

Client Sample ID: CCV

Lab ID#: 1509302A-16B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**e092102sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/21/15 09:35 AM**	

Compound	**%Recovery**
Methyl tert-butyl ether	112
Benzene	84
Toluene	97
Ethyl Benzene	108
m,p-Xylene	113
o-Xylene	113

Container Type: NA - Not Applicable

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

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Client Sample ID: CCV

Lab ID#: 1509302A-16C

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20092302**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/23/15 09:38 AM**	

Compound	**%Recovery**
Naphthalene	75
TPH ref. to Gasoline (MW=100)	100

Container Type: NA - Not Applicable

Surrogates	**%Recovery**	**Method Limits**
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	96	70-130

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Client Sample ID: CCV

Lab ID#: 1509302A-16D

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20092302sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/23/15 09:38 AM**	

Compound	%Recovery
Methyl tert-butyl ether	104
Benzene	102
Toluene	107
Ethyl Benzene	108
m,p-Xylene	106
o-Xylene	106

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	98	70-130

eurofins | Air Toxics

Client Sample ID: LCS

Lab ID#: 1509302A-17A

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**e092103a**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/21/15 10:21 AM**	

Compound	%Recovery	Method Limits
Naphthalene	118	60-140
TPH ref. to Gasoline (MW=100)	Not Spiked	

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	96	70-130
Toluene-d8	95	70-130
4-Bromofluorobenzene	99	70-130

eurofins | Air Toxics

Client Sample ID: LCSD

Lab ID#: 1509302A-17AA

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**e092104**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/21/15 11:12 AM**	

Compound	%Recovery	Method Limits
Naphthalene	119	60-140
TPH ref. to Gasoline (MW=100)	Not Spiked	

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	96	70-130
Toluene-d8	98	70-130
4-Bromofluorobenzene	100	70-130

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Client Sample ID: LCS

Lab ID#: 1509302A-17B

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**e092103sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/21/15 10:21 AM**	

Compound	%Recovery	Method Limits
Methyl tert-butyl ether	101	70-130
Benzene	80	70-130
Toluene	92	70-130
Ethyl Benzene	102	70-130
m,p-Xylene	106	70-130
o-Xylene	108	70-130

Container Type: NA - Not Applicable

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

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Client Sample ID: LCSD

Lab ID#: 1509302A-17BB

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**e092104sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/21/15 11:12 AM**	

Compound	%Recovery	Method Limits
Methyl tert-butyl ether	100	70-130
Benzene	79	70-130
Toluene	92	70-130
Ethyl Benzene	101	70-130
m,p-Xylene	106	70-130
o-Xylene	109	70-130

Container Type: NA - Not Applicable

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

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Client Sample ID: LCS

Lab ID#: 1509302A-17C

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20092303**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/23/15 10:24 AM**	

Compound	%Recovery	Method Limits
Naphthalene	104	60-140
TPH ref. to Gasoline (MW=100)	Not Spiked	

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	105	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	96	70-130

eurofins | Air Toxics

Client Sample ID: LCSD

Lab ID#: 1509302A-17CC

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20092304**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/23/15 11:09 AM**	

Compound	%Recovery	Method Limits
Naphthalene	105	60-140
TPH ref. to Gasoline (MW=100)	Not Spiked	

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	103	70-130
Toluene-d8	105	70-130
4-Bromofluorobenzene	95	70-130

eurofins | Air Toxics

Client Sample ID: LCS

Lab ID#: 1509302A-17D

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20092303sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/23/15 10:24 AM**	

Compound	%Recovery	Method Limits
Methyl tert-butyl ether	101	70-130
Benzene	99	70-130
Toluene	104	70-130
Ethyl Benzene	106	70-130
m,p-Xylene	104	70-130
o-Xylene	107	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	100	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	97	70-130

eurofins | Air Toxics

Client Sample ID: LCSD

Lab ID#: 1509302A-17DD

MODIFIED EPA METHOD TO-15 GC/MS SIM/FULL SCAN

File Name:	**20092304sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 9/23/15 11:09 AM**	

Compound	%Recovery	Method Limits
Methyl tert-butyl ether	101	70-130
Benzene	98	70-130
Toluene	103	70-130
Ethyl Benzene	106	70-130
m,p-Xylene	104	70-130
o-Xylene	106	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	104	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	97	70-130