March 20, 2015

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

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

Dear Mr. Wickham:

Enclosed is the Building 300 Vapor and Indoor Air Monitoring Plan (Plan) for the Former Pacific Electric Motors Site 1009 66th Avenue, Oakland, California; Alameda County Environmental Health (ACEH) Fuel Leak Case Number RO0000411 ("the Site"). 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 Erica Kalve of ARCADIS at (415) 491-4530 extension 22, or me at (510) 434-5071.

Sincerely,

Tim Simon
Aspire Public Schools

Enclosure

ARCADIS
Infrastructure · Water · Environment · Buildings

Imagine the result

Aspire Public Schools – College for Certain, LLC

Building 300 Vapor and Indoor Air Monitoring Plan

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

March 20, 2015

Erica Kalve, P.G.
Senior Geologist

Angeline Tan
Environmental Engineer

Building 300 Vapor and Indoor Air Monitoring Plan

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

Prepared for:
Aspire Public Schools
1001 22nd Avenue Suite 100
Oakland, California 94606

Prepared by:
ARCADIS U.S., Inc.
2000 Powell Street
Suite 700
Emeryville
California 94608
Tel 510 652 4500
Fax 510 652 4906

Our Ref.:
EM009155.0017

Date:
March 20, 2015

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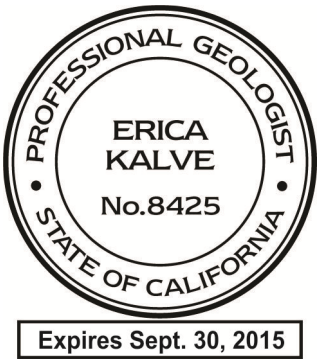
Certification

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 .*



Expires Sept. 30, 2015

Erica Kalve

March 20, 2015

Erica Kalve, P.G.
Senior Geologist
California Professional Geologist (8245)

Date

*A professional geologist's certification of conditions comprises a declaration of his or her professional judgment. It does not constitute a warranty or guarantee, expressed or implied, nor does it relieve any other party of its responsibility to abide by contract documents, applicable codes, standards, regulations, and ordinances.

1. Introduction

ARCADIS has prepared this vapor and indoor air monitoring plan (plan) 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"; Figures 1 and 2). 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.

This plan presents the proposed vapor and indoor air sampling plan following construction of the gymnasium building (also referred to as Building 300). This work plan follows applicable guidance per the Department of Toxic Substances Control (DTSC) Final 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 History

2.1 Project Overview

The site area is 2.51 acres and is located on the western side of 66th Avenue between East 14th Street (to the north) and San Leandro Street (to the south). The area around the Site is developed with a mixture of commercial, industrial, government, and multi-family residential buildings. The Site is bounded by a residential development to the north, Oakland Fire Department Station Number 2 to the east across 66th Avenue, Fruitvale Business Center to the south, and Northstar International Container Freight and Container Consolidation Services to the west.

The structures formerly associated with Pacific Electric Motors (and infrastructure) have all been demolished. The areas of affected soil have been removed in accordance with the Revised CAP (ARCADIS 2009a). In addition, areas of polychlorinated-biphenyl (PCB)-containing soil were remediated in accordance with the CAP, the Self-Implementing Cleanup Plan (SICP) submitted to the United States Environmental Protection Agency (USEPA) on October 23, 2009 (ARCADIS 2009b), the response letter from USEPA dated November 13, 2009 (USEPA 2009), and LFR Inc.'s (now ARCADIS) response letters to USEPA dated November 18, 2009 and

January 14, 2010. The configuration of the surface cap was presented in a letter to the USEPA by ARCADIS dated April 25, 2011 and the configuration of the cap was approved by USEPA in a letter dated June 16, 2011.

2.2 Current Conditions

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 (see Figure 2). The school occupies approximately 1.4 acres and consists of:

- two-story buildings (approximately 41,430 square feet total including 24 full-sized classrooms, 4 labs, 3 girls and 3 boys restrooms, and 4 staff restrooms);
- a proposed one-story building that will serve as a gym and recreation facility;
- 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 basketball; and
- several planter 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 PCBs containing soil at the Site. The cap is currently being modified as part of the construction of Building 300.

2.3 Environmental Conditions

The Revised CAP (ARCADIS 2009a) summarized the results of previous investigations, presented the site conceptual model, quantified the baseline risk of COPCs, developed site-specific risk-based cleanup goals, evaluated potential remedies, and presented an implementation plan for the selected remedies. Prior to redeveloping the Site, these remedial tasks were conducted to remove soil containing elevated concentrations of lead, arsenic, PCBs, benzene, and total petroleum hydrocarbons as gasoline (TPHg) and to treat remaining elevated concentrations of TPHg, BTEX, tertiary butyl alcohol (TBA), and MTBE in groundwater, soil, and soil gas.

Between 2009 and 2010 several remedial actions were implemented in accordance with the Revised CAP including

- soil excavation and removal of approximately 8,662 tons of affected soil (ARCADIS 2014a).
- air injection and soil-vapor extraction to reduce concentrations of TPHg, BTEX, TBA, and 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).

Remedial actions were highly effective in removing affected soil from the Site and remaining residual concerns related to soil exposure pathways are mitigated through maintenance of a cap and implementation of a Soil Management Plan (ARCADIS 2014b).

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 operation of the SVE/AS system.

In 2014, a soil vapor assessment was conducted to assess the potential for vapor intrusion to occur into the proposed gymnasium. Although groundwater conditions have improved following completion of remedial actions, the results of the soil vapor investigation indicated that soil gas concentrations were above health based screening criteria. The results of the screening evaluation indicated that vapor intrusion mitigation is appropriate and the VIM system design was subsequently submitted for ACEH review and approval (ARCADIS 2014c) prior to installation. The soil vapor sample results of the soil gas investigation are reported in Table 1.

The mitigation system was designed to prevent subsurface vapors from contacting building occupants at concentrations associated with health concerns. Conceptually, and consistent with the DTSC guidance, the vapor mitigation system will be comprised of vapor barrier membrane technology and a passive sub-slab soil vapor depressurization system.

3. Baseline Conditions Sample Plan

The DTSC Vapor Intrusion Guidance Document (DTSC 2011) suggests implementing baseline vapor sampling immediately after installation of a newly installed VIM system to establish baseline conditions below the building slab. Additionally, for subslab depressurization systems, baseline pressure measurements should be collected. Finally, indoor air quality monitoring is also necessary to evaluate the effectiveness of the mitigation system for achieving indoor air quality criteria.

Figures 2 and 3 illustrates the proposed indoor air and vapor sample locations and Table 2 provides a summary of sample locations and rationale. Note that the vapor samples will be collected from sample ports located on the effluent discharge risers for the system (see Figure 3). Additionally, a manometer will be installed on the effluent discharge riser to take differential pressure readings. However, since the VIM system is initially intended to be passive (pending results of the baseline sample event), the differential pressure induced by the passive subslab venting system is expected to be variable and dependent on the weather.

Indoor air and vapor sampling will be conducted under a site-specific health and safety plan (HASP) that details the scope of work and identifies the potential health and safety risks associated with the work. Indoor air and vapor samples will be collected following the methods and procedures described in Sections 4 and 5, below. Samples will be sent to a state certified laboratory under chain of custody procedures. The chain-of-custody will have the sample identification, date and time of collection, and the samplers' names. The chain-of-custody also will include the laboratory name, address, contact phone numbers, project name, project number, and site location. In addition, the sampler will include initial and final pressure gauge readings on the chain-of-custody. The chain-of-custody will be signed and dated with the time when samples are relinquished by the sample collection team.

4. Field Sampling Plan

Three baseline measurements are proposed to evaluate the effectiveness of the VIM system, as follows:

- Grab vapor samples will be collected from the effluent sampling port on the three vent riser pipes to document baseline subslab conditions following building construction.

- Differential pressure measurements will be taken on each riser pipe at the time of sample collection to document conditions at the time of sampling.

- Indoor air samples will be taken to evaluate indoor air quality and VIM system performance. The indoor air samples will be taken with the HVAC system off.

During the proposed baseline sample event, one background/outdoor sample, and one duplicate indoor air sample will be collected. The background/outdoor sample will be collected from outside of building 300 and analyzed to assess ambient air quality that could be affecting indoor air quality.

4.1 Air Sampling Equipment

Air samples will be collected in 6-liter stainless steel certified clean Summa canisters designed specifically for collecting indoor and outdoor ambient air samples. 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 8-hour indoor and outdoor air samples (assumed typical onsite receptor scenario; to be confirmed during the building walkthrough), before a canister is deployed to the field. The orifice is designed to allow for regulated flow of air between an 8-hour to 24-hour sample period. No flow checks will be performed in the field. 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.

Each outdoor air sampling collection device will be positioned at the height deemed representative (either on the roof or outside on the upwind side at approximately 3 to 5 feet above ground surface).

4.2 Indoor Air Field Sampling Procedures

Indoor sources of chemicals of concern and other VOCs may exist within the onsite building. Some significant impacts on indoor air quality may come from the use of consumer products, building materials, and personal activities. For example, VOCs can be found in cleaning agents, glues, deodorizers, dry-cleaned clothing, cigarette smoke, paints, varnishes, vehicle maintenance compounds, and vehicle exhaust. A building walkthrough will be conducted prior to implementation of the sample event to identify potential indoor air sources of chemicals of concern. The product inventory will focus on potential interferences from chemicals and products present throughout the building.

Eight-hour integrated and grab air samples will be collected at the proposed sample locations shown on Figures 2 and 3. 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.

The outdoor ambient air sample collection will begin within one hour of the start of indoor air sampling.

Meteorological data for this investigation will be obtained from a nearby weather station located in Oakland, California. Data will be collected for the time period corresponding to the sampling period. Data collected will include maximum and minimum temperatures, precipitation accumulation, and a summary of hourly wind speed and direction. The meteorological data will be cross-checked with field observations documented in the field sampling logs

4.3 Sample Analyses

Air samples will be transferred under strict chain-of-custody procedures to a California-certified laboratory and analyzed for a site-specific list of VOCs (see Table 3) 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. A list of laboratory reporting limits for the site-specific list of COPCs is provided in Table 3.

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.

4.4 Sample Documentation

Field notes will be maintained in an air sampling log. As noted, project name/project number, sample ID, start date, start time, stop date, stop time, weather, start temperature, stop temperature, start barometric pressure, stop barometric pressure,

start vacuum, stop vacuum, sample canister number, and sampler name will be recorded in the Air Sampling Log. The log will be kept on file at the ARCADIS office and will be available for review by authorized personnel. Sample tags will also be attached to each canister as a backup for the log entries.

A digital image of each sampling location will be acquired at the time of sampling. Where possible, a detailed photo log will be maintained throughout the project documenting, at a minimum, the photo file name, building identification, sample date, and description of sample location.

5. Proposed Schedule, Data Evaluation, and Reporting

5.1 Sample Schedule

The proposed scope of work will be conducted after the building has been substantially constructed. Specifically, the building layout will be complete and sheetrock will be installed. The plumbing and electric will be generally complete and air flow dynamics inside the building will be representative of post-construction conditions. This proposed schedule will accommodate the reporting and approval requirements for ACEH prior to occupancy, as well as CFCs goal to begin using the building as soon as possible following completion of the construction project. The estimated schedule for the baseline sample event is August 2015 and the target building occupancy date is October 5, 2015. ARCADIS estimates that the VIM system installation report will be submitted for ACEH review and approval by early September.

5.2 Data Evaluation

Initially, samples results will be compared to 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 2013). Sample results will also be compared to outdoor air concentrations to evaluate whether indoor air quality may be affected by sources unassociated with vapor intrusion, and USEPA RSLs with DTSC Note 3 updates to evaluate vapor intrusion potential for the list of site-specific compounds (Table 3). If the residential screening criteria are exceeded in indoor air, then additional evaluation of the VIM system with potential active venting may be necessary to ensure that elevated levels of VOCs are not present in indoor air.

5.3 Reporting

Upon completion of the proposed sampling program, a VIM system installation report will be prepared and submitted to the DTSC. At a minimum, the report will include the following items:

- introduction and background
- summary of vapor and indoor air sampling and analysis results, including data tables and sample location maps
- summary of field QA/QC activities
- summary of laboratory data validation and QA/QC activities
- copies of laboratory reports and chain-of-custody forms
- laboratory QA/QC data
- conclusions and recommendations, as appropriate

Additionally, as stated in the VIM system design document for the proposed gymnasium building (ARCADIS 2014), the summary report will be submitted to describe any additional steps necessary to ensure effective mitigation is achieved. The VIM system installation summary report will provide copies of the as-built plans with the stamp and signature of a state-licensed Professional Engineer (PE) with a PE statement that the VIM system was properly installed and tested.

6. References

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.

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

———. 2014b. Revised Soil Management Plan, Former Pacific Electric Motors Site, 1009 66th Avenue, Oakland, California (Fuel Leak Case Number RO0000411). May 20.

———. 2014c. Vapor Intrusion Mitigation System Desgin for Proposed Gymnasium Building, Former Pacific Electric Motors Site, 1009 66th Avenue, Oakland, California (Fuel Leak Case Number RO0000411). November 3.

California Department of Toxic Substances Control (DTSC). 2011. Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance). October.

———. 2013. Office of Human and Ecological Risk (HERO), Human Health Risk Assessment (HHRA) Note, HERO HHRA Note Number: 3. May 21.

United States Environmental Protection Agency (USEPA). 2009 response letter from USEPA dated November 13, 2009.

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

Tables

Table 1
Building 300 Soil Vapor Analytical Results From the
2014 Vapor Intrusion Assessment
Former Pacific Electric Motors Facility
1009 66th Avenue, Oakland, California

Compound Name / Location ID	USEPA Method TO-15								USEPA Method TO-17
	Total Petroleum Hydrocarbons (gasoline)	Benzene	Toluene	Ethylbenzene	m,p-Xylene	o-Xylene	Methyl Tertiary-Butyl Ether (MTBE)	Naphthalene	Naphthalene
	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
USEPA Residential RSL for Indoor Air/DTSC Note 3	--	0.084	310	1.1	10	10	11	0.083	0.083
Adjusted Soil Gas Screening Level Future Residential Buildings[1]	--	84	310,000	1,100	10,000	10,000	11,000	83	83
SVP-1	90,000	**300**	160	80	220	78	2,000	<48	<17
SVP-2	29,000	**1,600**	370	23	60	23	10	<44	<17
SVP-3	12,000	**98**	100	7.6	30	11	48	<9.1	<17
SVP-4	490,000	**4,300**	910	**1,400**	2,400	880	2,800	<190	19
SVP-5	18,000	**1,600**	390	64	240	83	73	<48	<17

Notes:
Bold indicates result above the screening level
< = not detected above the reporting limit
-- = not available; aliphatic and aromatic screening levels will be used as appropriate
$\mu g/m^3$ = microgram(s) per cubic meter
USEPA = United States Environmental Protection Agency
RSL = Regional Screening Level

1 = Attenuation factor for a future residential building is 0.001 (DTSC 2011).

Reference:
California Department of Toxic Substances Control (DTSC). 2011. Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance). October.

Table 2
Building 300 Indoor Air Sample Locations and Rationale
Former Pacific Electric Motors Facility
1009 66th Avenue, Oakland, California

Sample Location	Rationale
IA-01	Located at the girl's restroom - direct pathway
IA-02	Located at the office - direct pathway
IA-03	Located at the boy's restroom - direct pathway
IA-04	Located at the food service area - direct pathway
IA-05	western part of the main gymnasium - direct pathway
IA-06	eastern part of the main gymnasium - direct pathway

Note:
Locations are shown on Figure 2 and are approximate. Actual locations will vary based on actual field considerations.

Table 3
Site-Specific List of Volatile Organic Compounds and
Associated Screening Levels for Indoor Air
Former Pacific Electric Motors Facility
1009 66th Avenue, Oakland, California

Compound Name	**Base RL (µg/m^3)**	**USEPA Residential RSL for Indoor Air/DTSC Note 3 (µg/m^3)**
Total Petroleum Hydrocarbons (gasoline)	41	--
Benzene	0.16	0.08
Toluene	0.075	310
Ethylbenzene	0.16	1.1
m,p-Xylene	0.17	10
o-Xylene	0.087	10
Methyl Tertiary-Butyl Ether (MTBE)	0.36	11
Naphthalene	0.05	0.083

Notes
RL = reporting limit
USEPA = United States Protection Agency
RSL = Regional Screening Levels (updated January 2015)
µg/m^3 = microgram per cubic meter
-- = not available; aliphatic and aromatic screening levels will be used as appropriate

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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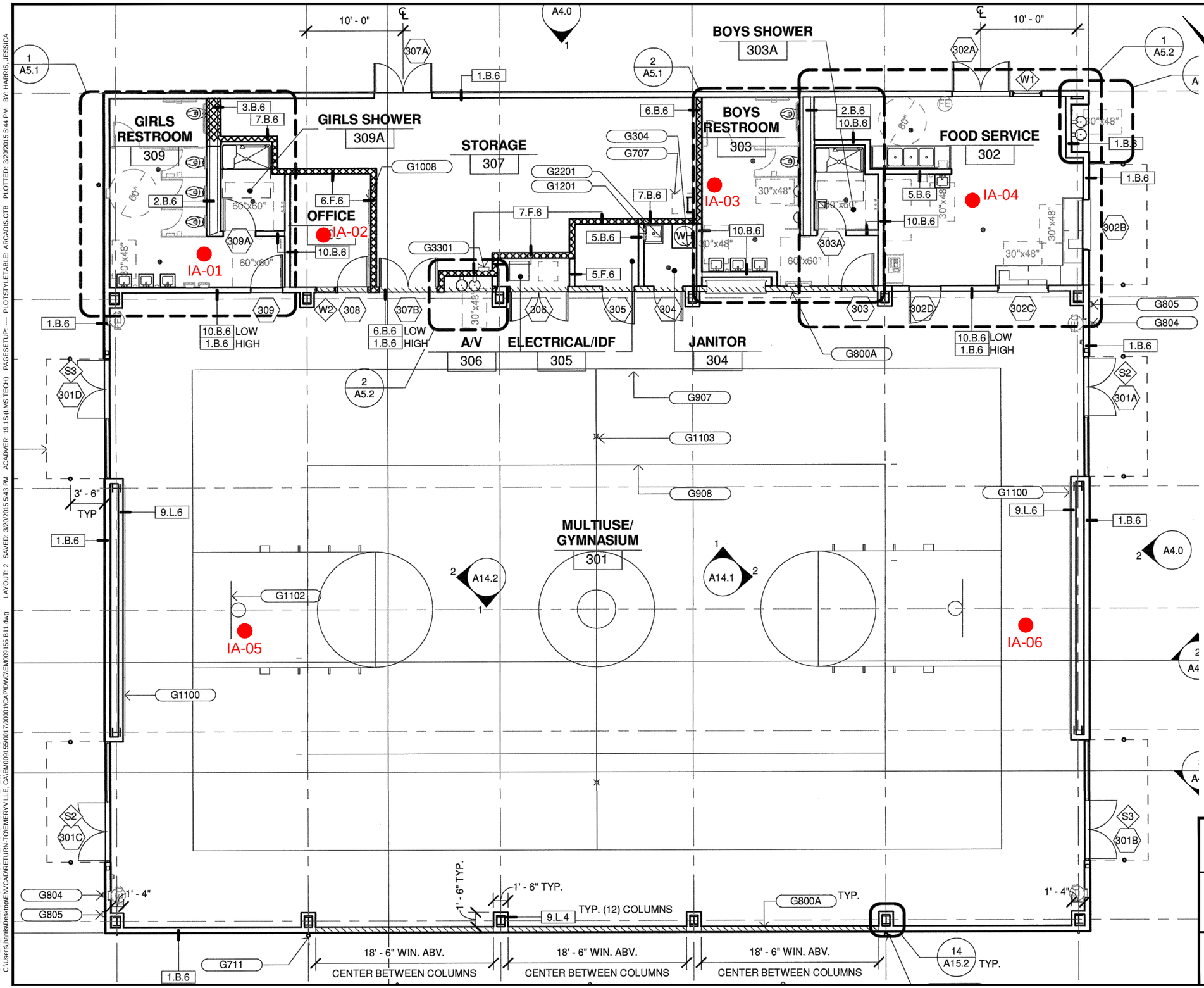
FIGURE 1

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



LEGEND

IA-01 ● PROPOSED INDOOR AIR SAMPLE LOCATION

NOTES:

1. SOURCE: K2A ARCHITECTURE + INTERIORS GRADING AND PAVING PLANS.
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

PROPOSED INDOOR AIR SAMPLE LOCATIONS

ARCADIS

FIGURE
2

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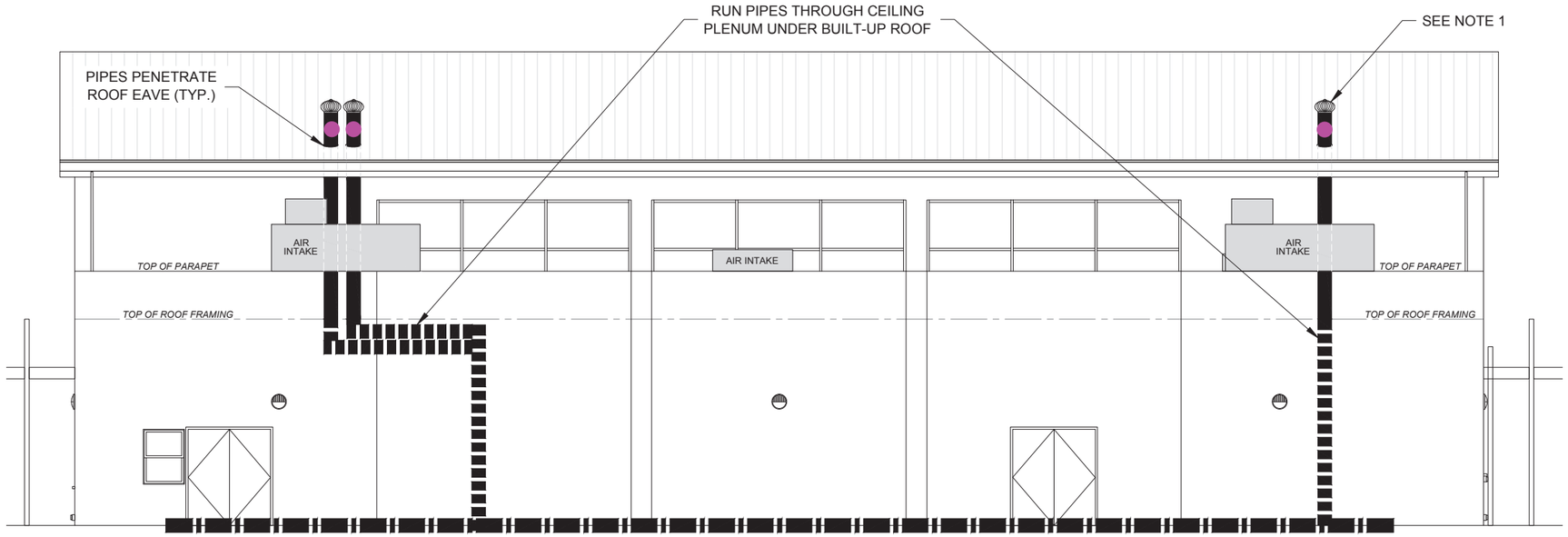


1
VC4 VC6

NORTHEAST ELEVATION

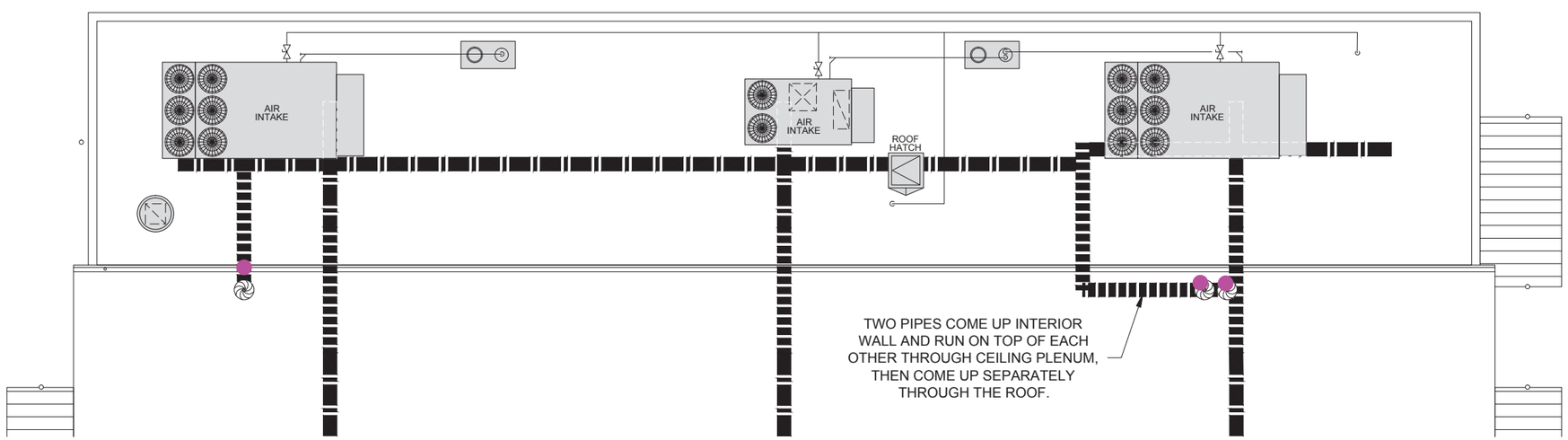
LEGEND

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

NOTES:

- PROPOSED VAPOR SAMPLR LOCATION

2. SOURCE: K2A ARCHITECTURE + INTERIORS GRADING AND PAVING PLANS.



ROOF PLAN VIEW

0 4' 8'
APPROXIMATE SCALE IN FEET

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

PROPOSED SOIL VAPOR SAMPLE LOCATIONS

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FIGURE
3