Appendix B Technical Memorandum, Human Health Risk Assessment of Soil Exposure and Vapor Intrusion to Indoor Air – 2750 - 2800 Casitas Avenue, Los Angeles, California, prepared by Environmental Health Decisions, November 18, 2020.

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APPENDIX A

Human Health Risk Assessment of Soil Exposure and Vapor Intrusion to Indoor Air, 2750 – 2800 Casitas Avenue, Los Angeles, California, prepared by Environmental Health Decisions dated November 18, 2020.

Leighton

Environmental
Health
Decisions

Technical Memorandum

To: Gwen Tellegen, P.E., Leighton

From: Jill Ryer-Powder, Ph.D., DABT, Environmental Health Decisions

Date: November 18, 2020

Re: **Human Health Risk Assessment of Soil Exposure and Vapor Intrusion to Indoor Air – 2750 - 2800 Casitas Avenue, Los Angeles, California**

This Human Health Risk Assessment (HHRA) is prepared by Environmental Health Decisions (EHD) on behalf of Leighton and Associates, Inc. (Leighton) for use in evaluating potential health risks associated with subsurface conditions at 2750 - 2800 Casitas Avenue in Los Angeles, California (the Site). The purpose of this report is to describe information regarding potential health risks to future residents at the Site due to the presence of chemicals in soil and soil vapor at the Site.

The Site is located at 2750 - 2800 Casitas Avenue in Los Angeles, California. The Site comprises an approximately 5.7-acre lot that is currently developed with an approximately 117,000 square-foot concrete tilt-up, slab-on-grade foundation, structure. The 2800 Casitas Avenue Project ("proposed Project"), formerly referred to as the Bow Tie Yard Lofts Project, would involve the demolition of the existing structure and construction of a new mixed-use development consisting of five buildings with up to 419 multi-family residential units, up to 64,000 square feet of commercial space, and a multi-story parking structure. Commercial uses on-site would include a mix of restaurant uses, office space, and a rooftop urban farm/greenhouse. A seven-story (85-foot high) parking garage on the northwest end of the Project Site would provide 720 on-site parking spaces on levels one through six. The seventh level of the parking structure would include an urban farm/greenhouse. Open space areas and recreational amenities would include approximately 58,176 square feet [https://planning.lacity.org/development-services/eir/2800-casitas-avenue-project-formerly-bow-tie-yard-lofts-project-0].

A human health risk assessment was previously conducted for the Site in 2016 [Enviro-Tox Services, Inc., 2016]. The purpose of this HHRA is to update the 2016 report in accordance with the most recent risk assessment guidance in order to evaluate the potential

for health risks to future residential occupants from exposure to chemicals present in soil and soil vapor. Based on the intended use of the property, the Site is assessed under a residential exposure scenario (assumes exposure for 26 years, 350 days per year, 24 hours per day) [DTSC, 2019]. The Site is evaluated using the most current site-related data [Leighton and Associates, Inc., 2015]. Consistent with United States and California risk assessment guidance, the Site is evaluated using multiple lines of evidence, including data for soil and soil vapor. Data are presented for each of these media in Table 1a and Table 1b (chemicals in the top 10 feet of soil) and Table 2 (chemicals in soil vapor).

As presented in Table 1a, total petroleum hydrocarbons (TPH) have been detected in the top 10 feet of soil (depth used for residential risk analysis) in the 6 carbon to 12 carbon range (C6-C12) and 23 carbon to 40 carbon range (C23-C40). As presented in Table 1b, metals have been detected in the top 10 feet of soil. There is the potential for future residents to contact chemicals detected in soil in the outdoor environment. Contact could occur via ingestion, dermal contact, and inhalation of vapors and particulates in outdoor air. The California Environmental Protection Agency's (Cal/EPA) Department of Toxic Substance Control (DTSC) provides guidance to evaluate the potential for adverse health effects from contact with chemicals in soil [Cal/EPA, 2015]. The soil risk assessment is presented in Table 3.

As presented in Table 2, volatile organic chemicals (VOCs) have been detected in vadose zone soil vapors. VOCs in the subsurface have the potential to migrate upwards and enter into buildings, causing inhalation exposures to occupants. DTSC requires that vapor intrusion into buildings be assessed at sites where VOCs are present in soil vapor. Assessment of the indoor air exposure pathway involves characterizing subsurface VOC vapor plumes, obtaining appropriate environmental data, using an attenuation factor to predict indoor air concentrations from vapor intrusion,[1] and conducting a human health risk assessment for the inhalation pathway to estimate cancer risk and noncancer hazard. DTSC provides guidance for assessing potential for health risks from the indoor air exposure pathway [DTSC, 2011]. The currently published value for the attenuation of soil vapors into indoor air for future residential properties is 0.001 [DTSC, 2011]. In February, 2020, DTSC and the California Water Resources Control Boards published draft guidance that proposes the screening of soil vapors using an attenuation factor of 0.03 [DTSC, 2020a]. This risk assessment uses both the currently published attenuation factor of 0.001 and the proposed attenuation factor of 0.03. Note that the use of 0.03 results in a cancer risk and noncancer hazard that are greater than what would be calculated using the currently published attenuation factor of 0.001. The 2020 draft DTSC has not yet been published as a final document. Evaluating risk using this attenuation is conservative and is conducted, in part, at the request of the DTSC [DTSC, 2020]. In a presentation on the proposed 2020 guidance document, the DTSC stated that the proposed 0.03 attenuation factor should utilized as screening tool, as just one part of a larger evaluation of risk for a site [DTSC,

[1] The currently published value for the attenuation of soil vapors into indoor air for future residential properties is 0.001 [DTSC, 2011]. In February, 2020, DTSC and the California Water Resources Control Boards published draft guidance that presents the use of an attenuation factor of 0.03 [DTSC, 2020a]. This risk assessment uses both the currently published attenuation factor of 0.001 and the proposed attenuation factor of 0.03.

2018]. The DTSC has also stated that site-specific conditions such as building construction and site grading should be considered in the risk evaluation [DTSC, 2020a].

This Technical Memorandum presents the methodology and results of the assessment of potential health risks resulting from contact with soil (using soil data) and vapor intrusion to indoor air (using soil vapor data). This Technical Memorandum is presented in five sections. Section 1.0 presents the methodology of the assessment of soil contact to outdoor residents. Section 2.0 presents the methodology of the assessment of vapor intrusion to indoor air. Section 3.0 presents the results of the assessments. Section 4.0 presents the discussion and conclusions. Section 5.0 presents the literature cited in this Technical Memorandum.

1.0 Assessment of Contact With Soil

The California Environmental Protection Agency's (Cal/EPA) DTSC provides guidance to evaluate the potential for adverse health effects from contact with chemicals in soil [Cal/EPA, 2015]. For a chemical identified as a carcinogen, the representative soil concentration of each chemical is divided by the USEPA Regional Screening Level (RSL) [USEPA, 2020], modified, if necessary (as discussed in DTSC HHRA Note 3 [DTSC, 2020a] so that the screening level (SL) utilized is that specifically recommended by the DTSC), and multiplied by 10^{-6} (0.000001) to calculate the cancer risk posed by that chemical. For a chemical identified as causing noncancer health effects, the representative soil concentration of each chemical is divided by its screening level to obtain a Hazard Quotient (HQ) for that chemical.

As an example, the residential SL soil for cancer effects for cobalt is 420 milligrams per kilogram (mg/kg) [USEPA, 2020] and the SL for noncancer effects for cobalt is 23 mg/kg [USEPA, 2020]. The maximum detected concentration of cobalt in soil was 15 mg/kg.

The cancer risk associated with this concentration is calculated as follows:

$$(15\ mg/kg\ /\ 420\ mg/kg) \times 10^{-6} = 3.6E\text{-}08$$

The noncancer hazard index associated with this concentration is calculated as follows:

$$15\ mg/kg\ /\ 23\ mg/kg = 0.65$$

Cancer risks are calculated for all potential carcinogens detected in the soil using the maximum detected concentration of each chemical (Table 3) The cancer risk for each carcinogen is summed to arrive at a cumulative cancer risk from chemicals in soil.

The cumulative cancer risk at this Site was calculated at 4E-08 (also expressed as 4×10^{-8} or 0.04 in 1 million). The cumulative cancer risk for chemicals detected in soil is less than the insignificant or *de minimis* risk of 1E-06 (also expressed as 1×10^{-6} or 1 in 1 million) and less than the Proposition 65 target risk of 1E-05 (also expressed as 10 in 1 million).

Noncancer hazard is calculated using the maximum concentration of each chemical detected in the soil. The noncancer hazard for each chemical using the maximum detected concentration of each chemical (Table 3) is summed to arrive at a cumulative noncancer hazard index from chemicals in soil.

The cumulative noncancer hazard index at this Site was calculated at 2. The cumulative soil noncancer index is greater than the benchmark value of 1. The noncancer hazard is driven by the presence of TPH in the C13-C22 range found in 3 samples located at the southeastern portion area of the Site. A hazard index greater than 1 commonly requires mitigation or remediation by Cal-EPA. Therefore, soils in the vicinity of samples LB12-5', LB12-10' and LB27-5' will be removed, with City of Los Angeles Department of Building and Safety oversight, prior to the commencement of building construction and properly disposed of off-site as described in more detail below.

Arsenic was detected in the top 10 feet of soil at concentrations ranging from 1 mg/kg to 5.4 mg/kg. Arsenic is not evaluated in terms of human health risk. Rather, as specified by DTSC [DTSC, 2008], an arsenic concentration of 12 mg/kg (the upper-bound ambient level of arsenic in Southern California) is utilized to compare representative concentrations of arsenic at the Site. Arsenic detected at concentrations less than 12 mg/kg are considered as consistent with the upper-bound ambient level of arsenic in Southern California and are not further evaluated in the risk assessment.

Lead was detected at concentrations ranging from 1.3 mg/kg to 39 mg/kg except for one sample (SB4-0.50) where lead was detected at a concentration of 93 mg/kg. The potential for health effects from exposure to lead in soil is evaluated by associating soil concentrations where exposure would result in an increase in blood lead level of 1 microgram per deciliter (µg/dl). One µg/dl is the estimated incremental increase in children's blood lead that would reduce IQ by up to 1 point. The screening level for lead in residential soil is 80 mg/kg [DTSC, 2020b]. This value represents the lead concentration in soil that will result in a 90th percentile estimate of a 1-µg/dl increase in blood lead in a child. There was one detection of lead that exceeds 80 mg/kg. This shallow soil sample will be removed from the site prior to grading activities in accordance with the Soils Management Plan required under Project Design Feature HAZ-PDF-1 in the Draft EIR. The specific dust mitigation measures to be used during this limited excavation of non-hazardous waste soils and the methods loading and transport for proper off-disposal will be addressed in the Soils Management Plan that will be submitted for review by the Los Angeles Building and Safety Department. During excavation and loading activities, active dust control measures will be implemented and monitored by Leighton and Associates. The 95% upper confidence limit of the mean concentration of lead at the Site was 31 mg/kg [Enviro-Tox, 2016], which is less than the benchmark concentration of 80 mg/kg.

2.0 Assessment of Health Risks from Vapor Intrusion to Indoor Air

The assessment of vapor intrusion to indoor air was conducted in accordance with risk assessment guidance available from the Department of Toxic Substances Control (DTSC) [DTSC, 2011 and DTSC, 2020a]. The assessment of vapor intrusion to indoor air was

conducted for a residential use scenario.

Soil vapor data was evaluated using the methodology presented by DTSC in their *"Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance)"* [DTSC, 2011] and *"Supplemental Guidance: Screening and Evaluating Vapor Intrusion – Draft for Public Comments"* [DTSC. 2020a]. The currently published guidance [DTSC, 2011] recommends applying a default attenuation factor of 0.001 (default value for future residential buildings) to maximum detected soil vapor concentrations to calculate representative indoor air concentrations. DTSC's proposed draft guidance [DTSC, 2020a] recommends also conducting a screening evaluation using an attenuation factor of 0.03 to two depths of soil vapor concentrations, i.e., (1) one depth just above known or suspected subsurface sources, the deepest level for evaluation being 15 feet below ground surface, and (2) one shallower depth to determine if additional shallow vadose zone contamination is present in calculate representative indoor air concentrations.

The calculated indoor air concentrations using 0.001 as the attenuation factor (Table 4) and using 0.03 as the attenuation factor with data at 5 and 15 feet below ground surface (Tables 5a and 5b, respectively) were compared with the residential cancer screening levels for indoor air and residential noncancer screening levels for indoor air to calculate cancer risks and noncancer hazard indices. The cumulative cancer risk using 0.001 as the attenuation factor was 1E-05, and the cumulative noncancer hazard index was 0.5. The cumulative cancer risks using 0.03 as the attenuation factor with data at 5 and 15 feet below ground surface were 4E-04 and 2E-04, respectively, and the cumulative noncancer hazard indices were 10 and 9, respectively.

3.0 Results of Risk Assessment

The chemicals of potential concern (all chemicals detected at least one time) detected in soil and soil vapor were evaluated for both potential cancer and noncancer effects for future residents at the Site located at 2750 and 2800 Casitas Avenue and 2800 Kerr Street in Los Angeles, California.

The results of the assessment of contact with chemicals in soil are presented in Table 3. The cumulative cancer risk using the maximum detected concentrations of all chemicals is 4E-08 and the cumulative noncancer hazard index is 2. Arsenic was detected at concentrations less than the regional background concentration of 12 mg/kg. Lead was detected at concentrations less than the screening level of 80 mg/kg except for one sample that was detected at 93 mg/kg, which will be removed prior to Site grading activities. The 95% upper confidence limit of the mean concentration for lead was 31 mg/kg, which is less than the screening level of 80 mg/kg.

The results of the assessment of vapor intrusion into indoor air using the soil vapor data with an attenuation factor of 0.001 are presented in Table 4. The cumulative cancer risk is 1E-05 and the cumulative noncancer hazard is 0.5. Cancer risk is driven by the presence of benzene and tetrachloroethylene. The cumulative cancer risks using data from 5 feet

below ground surface and an attenuation factor of 0.03 were 4E-04 and the noncancer hazard index was 10. Cancer risk is driven by the presence of benzene, naphthalene, tetrachloroethylene, and trichloroethylene. Noncancer hazard index is driven by the presence of benzene and tetrachloroethylene. The cumulative cancer risks using data from 15 feet below ground surface and an attenuation factor of 0.03 were 2E-04 and the noncancer hazard index was 9. Cancer risk is driven by the presence of benzene, tetrachloroethylene, and trichloroethylene. Noncancer hazard index is driven by the presence of benzene, tetrachloroethylene, and trichloroethylene. It should be noted that the soil vapor data presented in this HHRA was collected in 2015, and conditions may be different today. In addition, excavation and grading is planned as a part of site redevelopment. During excavation of area where elevated VOCs were identified, vapors will be monitored by Leighton and Associates using a Photo Ionization Detector. If elevated soil vapors are detected, vapor control measures (such as additional dust control by water application) will be implemented and, if appropriate, SCAQMD Notification will be made.

A new soil vapor survey will be conducted following the redevelopment excavation and grading activities, and an updated Human Health Risk Assessment will be prepared at that time. Based on the results of the updated HHRA, final vapor control measures will be implemented, as needed, following the review of the engineered plan by the City of Los Angeles Department of Building and Safety. If the predicted cumulative cancer health risks are less than or equal to1 in a million, no vapor control will be required. If the predicted cumulative cancer risk is between 1.5 and 10 in a million, a passive vapor control system will be installed beneath any buildings showing this elevated risk to residents or commercial occupants on the first floor. If the predicted cumulative cancer risk is greater than 10 in a million, a vapor control system with both passive and active components be installed beneath any buildings showing this elevated risk to residents or commercial occupants on the first floor. The active components of the vapor control system will only be activated if the results of a one-time post-installation vapor testing from the probes installed above the vapor membrane show levels of VOCs above the DTSC's indoor air screening levels for the future use of that area (commercial or residential).

The DTSC has developed specific action levels for TCE directly measured indoor air for a variety of indoor uses in their HERO Note 5 (2014). For a residential scenario, the Accelerated Response Action Level (ARAL) for trichloroethylene is 2 micrograms per cubic meter (ug/m^3) and the Urgent Response Action Level (URAL) is 6 ug/m^3 [DTSC. 2014].[2] For commercial and industrial uses (assuming 10 hour workdays) the ARAL is 7 ug/m3 and the URAL is 21 ug/m3. These response action levels are meant to address immediate threats to current occupants of buildings so only commercial/industrial uses should be considered for action at this time. Any TCE levels detected in the post-grading soil vapor survey will be again compared to these action levels using the published CalEPA attenuation factor at that time. If the levels exceed the action levels, a vapor barrier system

[2] The California Department of Toxic Substances Control (DTSC) Human and Ecological Risk Office (HERO) issued HERO HHRA Note Number 5 [August, 2014] to identify interim action levels for indoor air concentrations of trichloroethylene in order to protect against potential health effects from short term exposures.

will be installed in the building in the area on any such samples. Then, following the completion of the vapor barrier, the soil vapor probes installed above the liner will be sampled and TCE values will be compared to the URAL and ARAL.

Using an attenuation factor of 0.001, the indoor air concentration of trichloroethylene is predicted to be 0.31 ug/m^3. This concentration is less than the ARAL and URAL for both residential and commercial uses. Therefore, no response actions are required for the levels of TCE detected at the site using the current CalEPA attenuation factor and considering current site uses since the predicted indoor air risks are acceptable using the current CalEPA vapor attenuation factor (DTSC 2011).

A summary of the results of this assessment is presented in the following table:

Media / Representative Concentrations	**Cancer Risk**	**Noncancer Hazard**
Soil	4E-08	2
Soil Vapor – 0.001 attenuation	1E-05	0.5
Soil Vapor – 5-foot data – 0.03 attenuation	4E-04	10
Soil Vapor – 15-foot data – 0.03 attenuation	2E-04	9

4.0 Discussion and Conclusions

The purpose of this assessment was to evaluate the potential health risks to future residents associated with soil contact and inhalation of vapors that could migrate from soil vapor into indoor air at the Site located at 2750 - 2800 Casitas Avenue in Los Angeles, California. For potential carcinogens, risks are presented as a theoretical probability of developing cancer in terms of a number predicted cases in a million. [Cal/EPA, 2015]. For non-carcinogenic compounds the risks a presented as a hazard index, that expresses a ratio of the dose from exposure to a chemical and the safe dose of that chemical. If the ratio is less than 1, exposure to the chemical(s) are not expected to cause noncancer adverse health effects.

The DTSC's 2020 draft vapor screening guidance indicates that calculated cancer risks of less than or equal to 1 in 1 million and hazard indices of less than or equal to 1 represent conditions with acceptable health risks that do not require further investigation or mitigation. This draft DTSC 2020 document goes on to state that predicted risks from 1 in 1 million to 100 in 1 million and hazard index less than or equal to 1 may require additional investigation, monitoring, refined risk assessment, mitigation, and/or remediation based upon a site specific evaluation of the property. Finally, the draft 2020 document states that a predicted risk greater than 100 in 1 million or hazard index greater than 1 requires a response action such as mitigation and/or remediation. California's Proposition 65 considers a cancer risk of 10 in 1,000,000 (1E-05 or 1 x 10^{-5}) as an acceptable level and does not require a cancer warning.

Health risk was assessed using multiple lines of evidence and routes of exposure. The cancer risk from contact with soil was less than the *de minimis* or insignificant level of 1E-06 (1 in 1 million) and the noncancer hazard index was greater than 1 due to the presence of TPH in the C13-C22 range. To reduce the predicted soils hazard index less than 1, it is proposed that the soils in the area of LB12-5', LB12-10' and LB27-5' be excavated and hauled off-site for proper disposal. This work will be conducted with oversight by the City of Los Angeles Department of Building and Safety.

The cancer risks from vapor intrusion to indoor air using soil vapor data with an attenuation factor of 0.001 was 1E-05 (10 in 1 million) and the noncancer hazard index was less than 1. The predicted cancer risk is equal to the target level for cancer risk in accordance with Proposition 65 but within the range where the risk management decisions would be used to determine an appropriate action. Therefore, additional soil vapor investigation, , and an updated HHRA (to be conducted under City of Los Angeles Department of Building and Safety oversight) has been proposed following rough grading activities. Any TCE levels detected in the post-grading soils vapor assessment will be compared to the ARAL and URAL levels to determine any TCE remediation measures for future residents or commercial occupants. For a residential scenario, the Accelerated Response Action Level (ARAL) for trichloroethylene is 2 micrograms per cubic meter (ug/m^3) and the Urgent Response Action Level (URAL) is 6 ug/m^3 [DTSC. 2014].[3] For commercial and industrial uses (assuming 10 hour workdays) the ARAL is 7 ug/m3 and the URAL is 21 ug/m3. Based upon the results of the post-grading HHRA, mitigation and/or remediation may be required based on the new predicted health risks. A conceptual vapor control plan has been prepared for the Project by Brownfield Subslab and will be implemented if the post-grading HHRA indicates unacceptable risks, as determined by the City of Los Angeles Department of Building and Safety.

The cancer risks using the conservative draft 0.03 attenuation factor were greater than 1E-04 (100 in 1 million), and the noncancer hazard indices were greater than 1. Therefore, based on this analysis, the risk management decision would be that the Site would require mitigation and/or remediation. The ARAL and URAL (relevant to the concentrations of TCE in indoor air for the current industrial buildings on-Site) were not exceeded using the soil vapor data with an attenuation factor of 0.001 or 0.03 and soil vapor data at 5 feet below ground surface.

The results presented in the report are based on the reported chemicals concentrations and proposed future land use assuming homes are built at grade on the soil that is currently present at the Site. Further, this assessment is based upon data from soil and soil vapor collected in 2015, and after site grading activities in preparation for redevelopment, the soil vapor conditions will be significantly different.

[3] The California Department of Toxic Substances Control (DTSC) Human and Ecological Risk Office (HERO) issued HERO HHRA Note Number 5 [August, 2014] to identify interim action levels for indoor air concentrations of trichloroethylene in order to protect against potential health effects from short term exposures.

Following Site grading activities, soil and soil vapor will be sampled again and an updated health risk assessment will be conducted. Since conditions at the Site will change (e.g., soil removal), the results of the HHRA will change accordingly. If the post-grading HHRA indicates health risks greater than the de minimis level of 1 in 1 million and/or a noncancer hazard index greater than 1, mitigation measures will be implemented with City of Los Angeles Department of Building and Safety oversight to reduce the cancer risk less than or equal to the de minimis (insignificant) residential risk of 1 in 1 million and noncancer hazard index of less than or equal to 1.

5.0 Literature Cited

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TABLES

TABLE 1a

Summary of TPH, VOCs, and PCBs Analytical Test Results for Soil Samples at Depths to 10 Feet Below Ground Surface
2750 and 2800 Casitas Avenue, Los Angeles, California

Boring ID	Sample ID	Total Petroleum Hydrocarbons (TPH) mg/kg			Volatile Organic Compounds (VOCs) µg/kg	Polychlorinated Biphenyls (PCBs) µg/kg
		C6-C12	C13-C22	C23-C40		
LB1	LB1-0.5	--	--	--	--	--
	LB1-2	--	--	--	--	--
	LB1-5	--	--	--	--	--
	LB1-10	--	--	--	--	--
LB2	LB2-0.5	<1.0	<10	89	ND	--
	LB2-2	<1.0	<10	<10	--	--
	LB2-5	<1.0	<10	<10	ND	--
	LB2-10	<1.0	<10	<10	--	--
LB4	LB4-0.5	--	--	--	--	--
	LB4-2	--	--	--	--	ND
	LB4-5	--	--	--	--	ND
	LB4-10	--	--	--	--	ND
LB5	LB5-0.5	<1.0	21	140	--	--
LB6	LB6-0.5	--	--	--	ND	--
LB8	LB8-0.5	<1.0	<10	120	ND	--
	LB8-2	<1.0	17	110	--	--
LB9	LB9-0.5	<1.0	19	75	ND	--
	LB9-2	<1.0	<10	58	--	--
LB10	LB10-0.5	--	--	--	--	--
	LB10-2	--	--	--	--	--
	LB10-5	--	--	--	--	--
	LB10-5-D	--	--	--	--	--
LB11	LB11-0.5	--	--	--	ND	--
	LB11-0.5-D	--	--	--	ND	--
	LB11-2	--	--	--	ND	--
	LB11-2-D	--	--	--	ND	--
LB12	LB12-0.5	<1.0	30	220	ND	--
	LB12-2	<1.0	12	150	--	--
	LB12-2-D	<1.0	15	120	--	--
	LB12-5	<1.0	*130*	200	ND	--
	LB12-10	<1.0	41	160	ND	--
LB13	LB13-0.5	<1.0	<10	120	ND	--
	LB13-2	<1.0	24	230	--	--
	LB13-5	<1.0	<10	<10	ND	--
	LB13-5-D	<1.0	<10	<10	ND	--
	LB13-10	<1.0	<10	<10	ND	--
LB14	LB14-0.5	<1.0	32	310	ND	--
	LB14-2	<1.0	<10	120	--	--
LB25	LB25-5	<1.0	<10	<10	--	--
	LB25-10	<1.0	<10	<10	--	--
LB26	LB26-5	<1.0	31	50	--	--
	LB26-10	<1.0	<10	<10	--	--
LB27	LB27-5	<1.0	60	230	--	--
	LB27-10	<1.0	<10	<10	--	--
LB28	LB28-5	<1.0	<10	<10	--	--
	LB28-10	<1.0	<10	<10	--	--

Notes:
mg/kg - milligrams per kilogram
ug/kg - micrograms per kilogram
< - not detected at concentration
ND - not detected

TABLE 1b

Summary of Metals Analytical Test Results for Soil Samples at Depths to 10 Feet Below Ground Surface
2750 and 2800 Casitas Avenue, Los Angeles, California

Boring ID	Sample ID	Metals by EPA Method 6010B/7471A (mg/kg)																
		Antimony	Arsenic	Barium	Beryllium	Cadmium	Total Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
LB1	LB1-0.5	<2.0	<1.0	84	<1.0	<1.0	11	5.4	12	6.9	<0.10	<1.0	7.6	<1.0	<1.0	<1.0	26	39
	LB1-2	<2.0	<1.0	68	<1.0	<1.0	9.5	4.6	8.3	1.5	<0.10	<1.0	6.0	<1.0	<1.0	<1.0	23	28
	LB1-5	<2.0	<1.0	65	<1.0	<1.0	8.5	4.4	7.2	1.3	<0.10	<1.0	5.5	<1.0	<1.0	<1.0	21	27
	LB1-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LB2	LB2-0.5	<2.0	2.4	68	<1.0	<1.0	11	6.0	19	33	<0.10	<1.0	7.3	<1.0	<1.0	<1.0	23	63
	LB2-2	<2.0	1.9	89	<1.0	<1.0	12	6.6	15	3.8	<0.10	<1.0	8.8	<1.0	<1.0	<1.0	23	35
	LB2-5	<2.0	1.0	49	<1.0	<1.0	6.7	3.2	6.1	3.1	<0.10	<1.0	4.1	<1.0	<1.0	<1.0	19	19
	LB2-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LB4	LB4-0.5	4.8	2.5	81	<1.0	<1.0	13	4.8	31	*93*	<0.10	<1.0	8.3	<1.0	<1.0	<1.0	26	61
	LB4-2	<2.0	5.4	100	<1.0	<1.0	13	6.0	22	27	<0.10	<1.0	11	<1.0	<1.0	<1.0	30	63
	LB4-5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	LB4-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LB5	LB5-0.5	<2.0	2.6	69	<1.0	<1.0	11	4.9	18	31	<0.10	<1.0	7.5	<1.0	<1.0	<1.0	24	50
LB6	LB6-0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LB8	LB8-2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LB9	LB9-0.5	<2.0	3.3	64	<1.0	<1.0	11	4.2	14	39	<0.10	<1.0	7.0	<1.0	<1.0	<1.0	22	52
	LB9-2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LB10	LB10-0.5	<2.0	2.4	75	<1.0	<1.0	13	4.6	22	35	<0.10	<1.0	8.2	<1.0	<1.0	<1.0	27	54
	LB10-2	<2.0	2.6	77	<1.0	<1.0	12	4.9	20	38	<0.10	<1.0	8.6	<1.0	<1.0	<1.0	25	59
	LB10-5	<2.0	1.9	55	<1.0	<1.0	10	3.9	11	15	<0.10	<1.0	6.1	<1.0	<1.0	<1.0	22	42
	LB10-5-D	<2.0	5.2	64	<1.0	<1.0	9.3	4.0	14	22	<0.10	<1.0	6.8	<1.0	<1.0	<1.0	21	44
LB11	LB11-0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	LB11-0.5-D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	LB11-2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	LB11-2-D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LB12	LB12-0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	LB12-2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	LB12-2-D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	LB12-5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	LB12-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	LB12-15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	LB12-20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LB13	LB13-0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	LB13-2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	LB13-5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	LB13-5-D	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	LB13-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	LB13-15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	LB13-20	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LB14	LB14-0.5	<2.0	2.2	67	<1.0	<1.0	15	4.1	16	23	<0.10	<1.0	7.8	<1.0	<1.0	<1.0	21	43
	LB14-2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
LB21	LB21-0.5	--	--	--	--	--	--	--	--	17	--	--	--	--	--	--	--	--
	LB21-2	--	--	--	--	--	--	--	--	24	--	--	--	--	--	--	--	--
LB22	LB22-0.5	--	--	--	--	--	--	--	--	2.0	--	--	--	--	--	--	--	--
	LB22-2	--	--	--	--	--	--	--	--	35	--	--	--	--	--	--	--	--
LB23	LB23-0.5	--	--	--	--	--	--	--	--	27	--	--	--	--	--	--	--	--
	LB23-2	--	--	--	--	--	--	--	--	26	--	--	--	--	--	--	--	--
LB24	LB24-0.5	--	--	--	--	--	--	--	--	16	--	--	--	--	--	--	--	--
	LB24-2	--	--	--	--	--	--	--	--	26	--	--	--	--	--	--	--	--

Notes:
mg/kg - milligrams per kilogram
-- - not sampled or not analyzed
< - not detected at concentration

TABLE 2

Summary of Soil Vapor Analytical Results

2750 and 2800 Casitas Avenue, Los Angeles, California

Boring ID	Sample ID	Sample Depth (feet bgs)	Concentration in micrograms per liter (ug/l)											
			Benzene	cis-1,2,-Dichloroethene	Methylene chloride (Dichloromethane)	Napthalene	n-Propylbenzene	Styrene	Tetrachloroethylene	Toluene	Trichloroethylene	1,3,5-Trimethylbenzene	1,2,4-Trimethylbenzene	m,p-Xylene
LB1	LB1-5	5.0	*0.50*	0.23	<0.10	0.07	<0.10	<0.10	0.05	<0.20	<0.02	<0.10	<0.10	<0.10
	LB1-15	15	*0.26*	0.19	<0.10	<0.02	<0.10	<0.10	0.16	<0.20	0.31	<0.10	<0.10	<0.10
LB2	LB2-5	5.0	<0.02	<0.10	<0.10	<0.02	<0.10	<0.10	*2.9*	<0.20	<0.02	<0.10	<0.10	<0.10
	LB2-15	15	<0.02	<0.10	<0.10	<0.02	<0.10	<0.10	*2.2*	<0.20	0.05	<0.10	<0.10	<0.10
LB3	LB3-5	5.0	0.02	<0.10	<0.10	<0.02	<0.10	<0.10	*2.0*	<0.20	<0.02	<0.10	<0.10	<0.10
LB4	LB4-5	5.0	0.04	<0.10	<0.10	<0.02	<0.10	<0.10	0.09	0.39	<0.02	<0.10	<0.10	<0.10
	LB4-15	15	0.05	<0.10	<0.10	<0.02	<0.10	<0.10	0.24	0.46	<0.02	<0.10	0.14	0.12
	LB4-15 REP	15	0.03	<0.10	<0.10	<0.02	<0.10	<0.10	0.13	0.22	<0.02	<0.10	<0.10	<0.10
LB5	LB5-3	3.0	<0.02	<0.10	<0.10	<0.02	<0.10	<0.10	0.07	<0.20	<0.02	<0.10	<0.10	<0.10
LB6	LB6-3.5	3.5	0.08	<0.10	<0.10	<0.02	0.43	<0.10	0.09	<0.20	0.02	0.65	*1.1*	<0.10
LB9	LB9-3.5	3.5	0.06	<0.10	<0.10	<0.02	<0.10	<0.10	0.12	<0.20	0.03	<0.10	<0.10	<0.10
LB10	LB10-5	5.0	0.07	<0.10	<0.10	<0.02	<0.10	<0.10	<0.02	0.41	<0.02	<0.10	<0.10	<0.10
LB11	LB11-3	3.0	0.03	<0.10	0.15	<0.02	<0.10	<0.10	0.11	<0.20	<0.02	<0.10	0.18	<0.10
LB13	LB13-5	5.0	0.05	<0.10	<0.10	0.05	<0.10	<0.10	0.08	0.44	<0.02	<0.10	<0.10	<0.10
	LB13-15	15	0.06	<0.10	<0.10	<0.02	<0.10	<0.10	0.06	<0.20	<0.02	<0.10	<0.10	<0.10
LB14	LB14-2.5	2.5	0.03	<0.10	<0.10	<0.02	<0.10	0.14	<0.02	<0.20	<0.02	<0.10	<0.10	<0.10
LB15	LB15-5	5.0	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	*1.10*	<0.020	<0.020	<0.020	<0.020	<0.020
	LB15-15	15	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	*2.30*	<0.020	<0.020	<0.020	<0.020	<0.020
LB16	LB16-5	5.0	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	*0.995*	<0.020	<0.020	<0.020	<0.020	<0.020
	LB16-15	15	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	*1.96*	<0.020	<0.020	<0.020	<0.020	<0.020
LB17	LB17-5	5.0	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	*0.582*	<0.020	<0.020	<0.020	<0.020	<0.020
	LB17-15	15	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	*0.935*	<0.020	0.293	<0.020	<0.020	<0.020
LB18	LB18-5	5.0	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.246	<0.020	<0.020	<0.020	<0.020	<0.020
	LB18-15	15	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	*0.861*	<0.020	<0.020	<0.020	<0.020	<0.020
LB19	LB19-5	5.0	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.200	<0.020	<0.020	<0.020	<0.020	<0.020
	LB19-15	15	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	*1.36*	<0.020	<0.020	<0.020	<0.020	<0.020
	LB19-15 DUP	15	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	*1.43*	<0.020	<0.020	<0.020	<0.020	<0.020
LB20	LB20-5	5.0	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.177	<0.020	<0.020	<0.020	<0.020	<0.020
	LB20-15	15	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	*2.17*	<0.020	0.305	<0.020	<0.020	<0.020
LB25	LB25-5	5.0	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.180	<0.020	<0.020	<0.020	<0.020	<0.020
	LB25-15	15	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.220	<0.020	<0.020	<0.020	<0.020	<0.020
LB26	LB26-5	5.0	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.110	<0.020	<0.020	<0.020	<0.020	<0.020
	LB26-15	15	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.181	<0.020	<0.020	<0.020	<0.020	<0.020

Notes:
ug/L - micrograms per liter
ft bgs - feet below ground surface
< - not detected at concentration

TABLE 3
Human Heatlh Risk Assessment - Residential Soil Exposure
2750 and 2800 Casitas Avenue, Los Angeles, California

Chemical	Maximum Concentration (mg/kg)	Cancer SL	Noncancer SL	Cancer Risk	Noncancer Hazard
Antimony	4.8	nc	31	0.0E+00	0.155
Arsenic	5.4	na	na	0.0E+00	0.000
Barium	100	nc	15000	0.0E+00	0.007
Total Chromium	6.6	nc	120000	0.0E+00	0.0001
Cobalt	15	420	23	3.6E-08	0.652
Copper	31	nc	3100	0.0E+00	0.010
Lead	93	na	na	0.0E+00	0.000
Nickel	11	15000	820	7.3E-10	0.013
Vanadium	30	nc	390	0.0E+00	0.077
Zinc	63	nc	23000	0.0E+00	0.003
C13-C22 aliphatic	65	nc	96	0.0E+00	0.677
C13-C22 aromatic	65	nc	97	0.0E+00	0.670
C23-C40 aliphatic	155	nc	230000	0.0E+00	0.001
C23-C40 aromatic	155	nc	2400	0.0E+00	0.065
				4E-08	2

mg/kg - milligrams per kilogram
TPH concentrations are maximum detected concentration - assumed 1/2 aromatic and 1/2 aliphatic
Arsenic eliminated from evaluation based on maximum concentration less than Southern California Regionals Background level of 12 mg/kg
Maximum concentration of lead compared with DTSC HERO Note 3 Screening Level of 80 mg/kg
SL - Screening Level; California DTSC HERO Note 3 (June, 2020) or, if not available, USEPA Regional Screening Level (May, 2020)
nc -not a carcinogen
na - not applicable

TABLE 4

Human Heatlh Risk Assessment - Residential Vapor Intrusion to Indoor Air - Attenuation Factor = 0.001

2750 and 2800 Casitas Avenue, Los Angeles, California

	Maximum Concentration (ug/l)	Maximum Concentration (ug/m3)	Indoor Air Concentration(attenuation factor 0.001), ug/m3	Cancer SL (ug/m3)	Noncancer SL (ug/m3)	Cancer Risk	Noncancer Hazard
Benzene	0.5	500	0.5	0.097	3.1	5.2E-06	1.6E-01
cis-1,2,-Dichloroethene	0.23	230	0.23	nc	8.3	0.0E+00	2.8E-02
Methylene chloride	0.15	150	0.15	1	420	1.5E-07	3.6E-04
Napthalene	0.07	70	0.07	0.083	3.1	8.4E-07	2.3E-02
n-Propylbenzene	0.43	430	0.43	nc	1000	0.0E+00	4.3E-04
Styrene	0.14	140	0.14	nc	940	0.0E+00	1.5E-04
Tetrachloroethylene	2.9	2900	2.9	0.46	42	6.3E-06	6.9E-02
Toluene	0.46	460	0.46	nc	310	0.0E+00	1.5E-03
Trichloroethylene	0.31	310	0.31	0.48	2.1	6.5E-07	1.5E-01
1,3,5- Trimethylbenzene	0.65	650	0.65	nc	63	0.0E+00	1.0E-02
1,2,4-Trimethylbenzene	1.1	1100	1.1	nc	63	0.0E+00	1.7E-02
m,p-Xylene	0.12	120	0.12	nc	100	0.0E+00	1.2E-03
						1E-05	0.5

Notes

Residential Scenario

SL - DTSC HERO Note 3 screening level (June, 2020) or, if not avaialble, USEPA RSL (May, 2020)

ug/l - micorgrams per liter

ug/m3 - micrograms per cubic meter

nc - not a carcinogen per DTSC or USEPA

TABLE 5a

Human Heatlh Risk Assessment - Residential Vapor Intrusion to Indoor Air - Attenuation Factor = 0.03; Depth 5 ft

2750 and 2800 Casitas Avenue, Los Angeles, California

	Maximum Concentration (ug/l)	Maximum Concentration (ug/m3)	Indoor Air Concentration (attenuation factor 0.03), ug/m3	Cancer SL (ug/m3)	Noncancer SL (ug/m3)	Cancer Risk	Noncancer Hazard
Benzene	0.5	500	15	0.097	3.1	1.5E-04	4.8E+00
cis-1,2,-Dichloroethene	0.23	230	6.9	nc	8.3	0.0E+00	8.3E-01
Methylene chloride	0.15	150	4.5	1	420	4.5E-06	1.1E-02
Napthalene	0.07	70	2.1	0.083	3.1	2.5E-05	6.8E-01
n-Propylbenzene	0.43	430	12.9	nc	1000	0.0E+00	1.3E-02
Styrene	0.14	140	4.2	nc	940	0.0E+00	4.5E-03
Tetrachloroethylene	2.9	2900	87	0.46	42	1.9E-04	2.1E+00
Toluene	0.44	440	13.2	nc	310	0.0E+00	4.3E-02
Trichloroethylene	0.03	30	0.9	0.48	2.1	1.9E-06	4.3E-01
1,3,5- Trimethylbenzene	0.65	650	19.5	nc	63	0.0E+00	3.1E-01
1,2,4-Trimethylbenzene	1.1	1100	33	nc	63	0.0E+00	5.2E-01
m,p-Xylene	nd	nd	na	nc	100	0.0E+00	0.0E+00
						4E-04	10

Notes

Residential Scenario

SL - DTSC HERO Note 3 screening level (June, 2020) or, if not avaialble, USEPA RSL (May, 2020)

ug/l - micorgrams per liter

ug/m3 - micrograms per cubic meter

nc - not a carcinogen per DTSC or USEPA

TABLE 5b

Human Heatlh Risk Assessment - Residential Vapor Intrusion to Indoor Air - Attenuation Factor = 0.03; depth - 15 ft

2750 and 2800 Casitas Avenue, Los Angeles, California

	Maximum Concentration (ug/l)	Maximum Concentration (ug/m3)	Indoor Air Concentration (attenuation factor 0.03), ug/m3	Cancer SL (ug/m3)	Noncancer SL (ug/m3)	Cancer Risk	Noncancer Hazard
Benzene	0.26	260	7.8	0.097	3.1	8.0E-05	2.5E+00
cis-1,2,-Dichloroethene	0.19	190	5.7	nc	8.3	0.0E+00	6.9E-01
Methylene chloride	nd	nd	0	1	420	0.0E+00	0.0E+00
Napthalene	nd	nd	0	0.083	3.1	0.0E+00	0.0E+00
n-Propylbenzene	nd	nd	0	nc	1000	0.0E+00	0.0E+00
Styrene	nd	nd	0	nc	940	0.0E+00	0.0E+00
Tetrachloroethylene	2.3	2300	69	0.46	42	1.5E-04	1.6E+00
Toluene	0.46	460	13.8	nc	310	0.0E+00	4.5E-02
Trichloroethylene	0.31	310	9.3	0.48	2.1	1.9E-05	4.4E+00
1,3,5- Trimethylbenzene	nd	nd	0	nc	63	0.0E+00	0.0E+00
1,2,4-Trimethylbenzene	0.14	140	4.2	nc	63	0.0E+00	6.7E-02
m,p-Xylene	0.12	120	3.6	nc	100	0.0E+00	3.6E-02
						2E-04	9

Notes

Residential Scenario

SL - DTSC HERO Note 3 screening level (June, 2020) or, if not avaialble, USEPA RSL (May, 2020)

ug/l - micorgrams per liter

ug/m3 - micrograms per cubic meter

nc - not a carcinogen per DTSC or USEPA

APPENDIX B

Recommended Potential Vapor Mitigation Measures for Proposed Project at 2800 Casitas Avenue, Los Angeles, California, prepared by Brownfield Subslab, dated October 22, 2020.

Leighton

BROWNFIELD SUBSLAB

SOIL VAPOR MANAGEMENT FOR HABITATION
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October 22, 2020

Attn: Robin Ferber, Gwen Tellegen

Recommended Potential Vapor Reduction Measures for Proposed Project at 2800 Casitas Avenue, Los Angeles, California

PROJECT DESCRIPTION. The proposed project is to include mixed-use commercial and multi-family-residential construction, and a parking structure.

VOC REDUCTION. Soil vapor intrusion must be reduced to levels considered safe by the State of California Department of Toxic Substances Control (DTSC) for indoor air (IA). Commercial use has different and slightly higher screening levels than residential occupancy. Health Risk Assessments (HHRA) are used in determining whether soil vapor reduction is required.

- The soil vapor reduction system proposed in this letter is based upon review of an HHRA based upon Leighton and Associates 2015 soil vapor data which was collected with the current industrial and commercial buildings still existing on the site).[1]

- Specific areas of the site requiring vapor reduction measures, and proposed vapor reduction measures for each building area, will be determined by Leighton and Associates following the completion of a post-grading soil vapor survey and an updated HHRA.

The soil vapor reduction system proposed in this letter is based upon review of the architect's Planning Submittal[2] schematics, as follows:

- Parking Garage. The parking garage is planned to be an "open structure" having natural ambient ventilation with an open perimeter. With the open

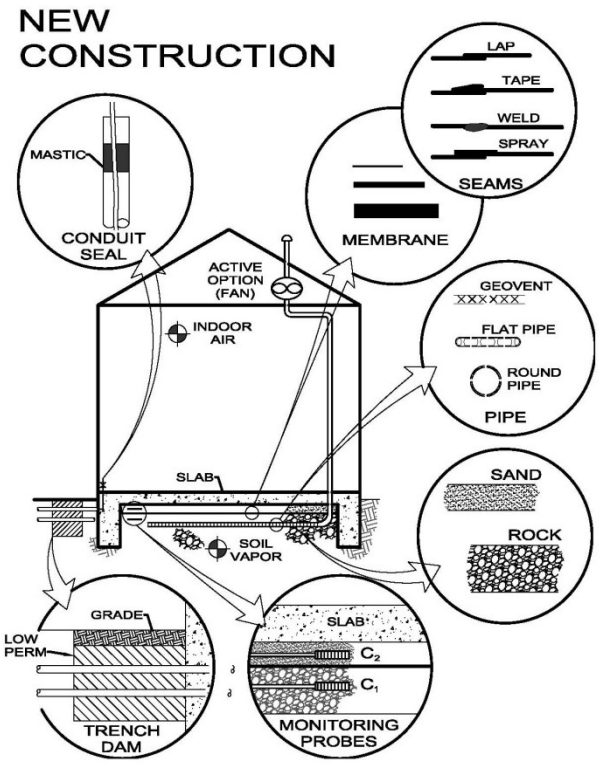
[1] *Human Health Risk Assessment of Soil Exposure and Vapor Intrusion to Indoor Air – 2750 and 2800 Casitas Avenue, Los Angeles, California,* Draft Technical Memorandum to Gwen Tellegen, Leighton, from Jill Ryer-Powder, Environmental Health Decisions, dated October 22, 2020.

[2] *Bow Tie Yard Lofts,* Planning Submittal, Rios Clementi Hale Studios, dated July 28, 2018.

configuration, this structure will not need soil vapor mitigation except for any small enclosed rooms or areas – such as elevator shafts, enclosed stairwells if any, and perhaps utility rooms -- where based upon a post-grading soil vapor survey, unacceptable health risk may exist. If the parking structure design changes to be more enclosed, additional vapor reduction measures may be considered.

- Mixed Use Buildings. Depending on the results of post grading sampling, some of the mixed-use buildings may require subslab membranes and vent piping with the possible installation of fans in order to activate the passive system, if the new data suggests this is necessary to control soil vapors to accepted regulatory screening levels.

SPECIFIC RECOMMENDATIONS. The specific measures implemented for each building, including potential active components, will be based upon soil vapor concentrations. The conceptual potential soil vapor measures presented below will be modified based upon the results of a post-grading soil vapor survey and updated HHRA for the Project.



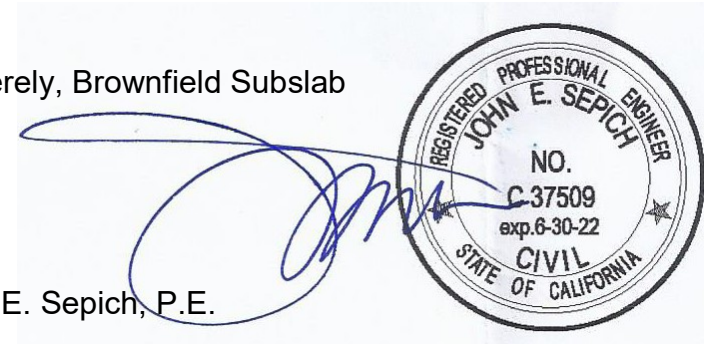
- subslab venting – perforated plastic pipe, minimum 3" diameter, in stone layer;
- stone layer – minimum four-inch thick layer of pea rock or gravel;
- membrane – twenty-mil thick ethyl vinyl alcohol (EVOH) composite;
- membrane seams – sprayed;
- monitoring probes – plastic tubes above and below membrane capable of being sampled without entering the building;
- trench dams – low permeability plugs in utility trenches at buildings;
- conduit seals -- low VOC flexible caulk at dry utility conduits.
- power – 120 VAC weatherproof duplex outlet at each vent riser to be installed in buildings which may require active mitigation following the post-grading soil vapor survey and updated HHRA; and
- fans – radon type fans capable of 26"H_2O total dynamic head at each vent riser, to be installed in buildings which may require active mitigation as determined following the post-grading soil vapor survey and HHRA, to allow for active operation as necessary.
- In addition, it is recommended that all construction materials, particularly carpeting, padding, flooring, glues, mastics and foams be tested for PCE

prior to installation in the residential buildings. Indoor sources of VOCs from construction materials and cleaning products may off-gas VOCs at levels in excess of above IA screening levels.

SPECIAL INSPECTION. VOC mitigation construction should be special-inspected and certified by an appropriately registered environmental professional.

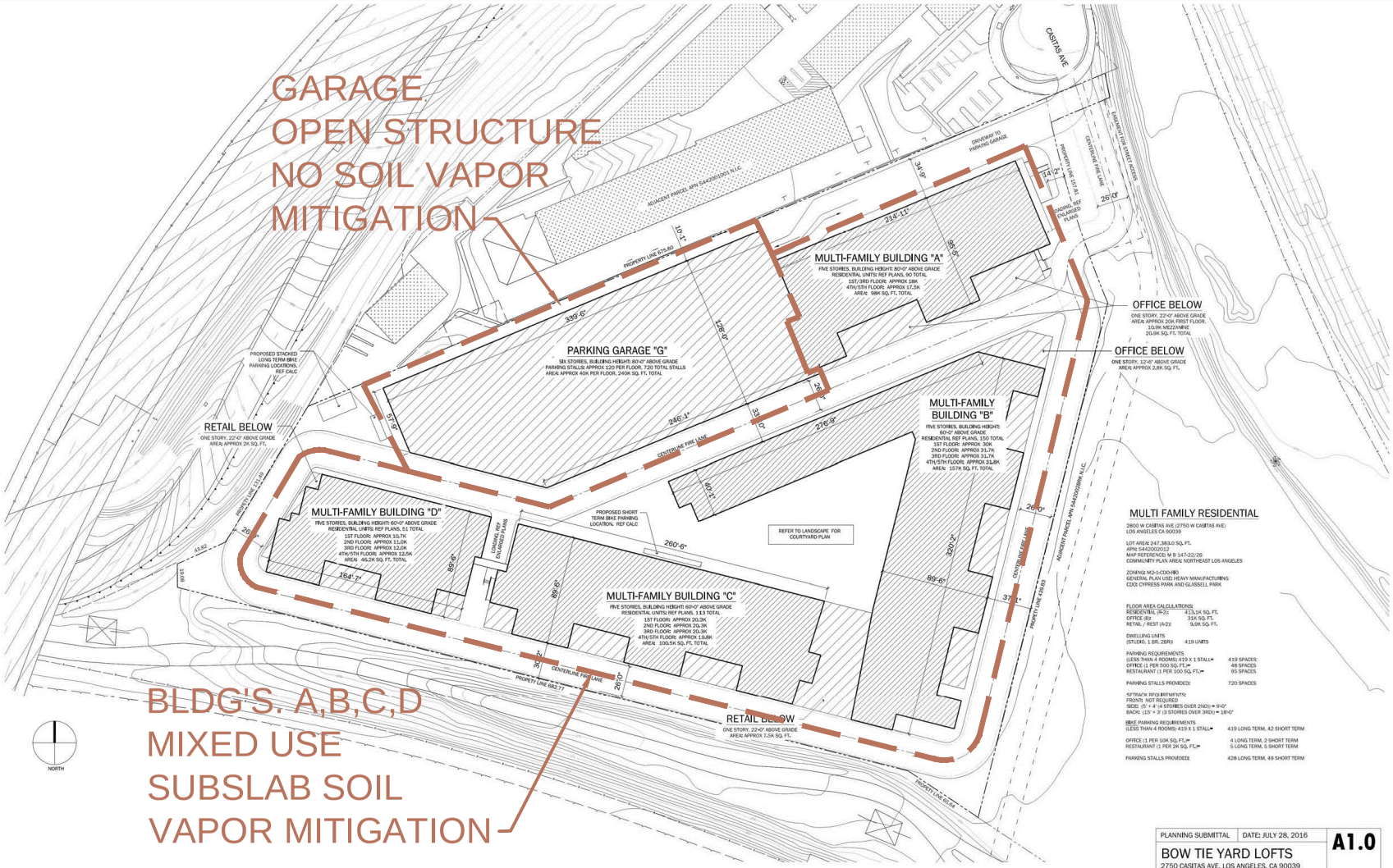
LIMITATIONS. This report is not a comprehensive review of all environmental conditions on the site, but is based upon the facts described or referenced above. This report has been prepared using currently accepted practices and principles; and is for use only by or as authorized by Leighton and Associates, in relation to the subject project.

Sincerely, Brownfield Subslab



John E. Sepich, P.E.

<u>Conceptual Soil Vapor Reduction Attachments</u>
Conceptual Vapor Reduction Key Map
Conceptual Mitigation Sections
Conceptual Plan - Building G
Conceptual Vapor Reduction Plan - Building A
Conceptual Vapor Reduction Plan - Building B
Conceptual Vapor Reduction Plan - Building C
Conceptual Vapor Reduction Plan - Building D
Conceptual Vapor Monitoring Probe Map
Conceptual Subslab System Details
Conceptual Monitoring Probe Details
Conceptual Vent Riser and Fan Details



MULTI FAMILY RESIDENTIAL

2800 W CASITAS AVE (2750 W CASITAS AVE)
LOS ANGELES CA 90039

LOT AREA 247.380.0 SQ. FT.
APN: 5442002012
MAP REFERENCE: M B 147-22/26
COMMUNITY PLAN AREA: NORTHEAST LOS ANGELES

ZONING: M2-1-CDO-HRO
GENERAL PLAN USE: HEAVY MANUFACTURING
COO: CYPRESS PARK AND GLASSELL PARK

FLOOR AREA CALCULATIONS:
RESIDENTIAL (R-2): 413.1K SQ. FT.
OFFICE (B): 31K SQ. FT.
RETAIL / REST (A-2): 9.9K SQ. FT.

DWELLING UNITS
(STUDIO, 1 BR, 2BR): 419 UNITS

PARKING REQUIREMENTS
(LESS THAN 4 ROOMS) 419 X 1 STALL= 419 SPACES
OFFICE (1 PER 500 SQ. FT.)= 48 SPACES
RESTAURANT (1 PER 100 SQ. FT.)= 95 SPACES

PARKING STALLS PROVIDED: 720 SPACES

SETBACK REQUIREMENTS:
FRONT: NOT REQUIRED
SIDE: (5' + 4' (4 STORIES OVER 2ND)) = 9'-0"
BACK: (15' + 3' (3 STORIES OVER 3RD)) = 18'-0"

BIKE PARKING REQUIREMENTS
(LESS THAN 4 ROOMS) 419 X 1 STALL= 419 LONG TERM, 42 SHORT TERM

OFFICE (1 PER 10K SQ. FT.)= 4 LONG TERM, 2 SHORT TERM
RESTAURANT (1 PER 2K SQ. FT.)= 5 LONG TERM, 5 SHORT TERM

PARKING STALLS PROVIDED: 428 LONG TERM, 49 SHORT TERM

PLANNING SUBMITTAL	DATE: JULY 28, 2016	A1.0
BOW TIE YARD LOFTS 2750 CASITAS AVE, LOS ANGELES, CA 90039		

RIOS CLEMENTI HALE STUDIOS
PH: 323.785.1800 FAX: 323.785.1801
639 N VARCHMONT BLVD SUITE 100 LOS ANGELES, CA 90004

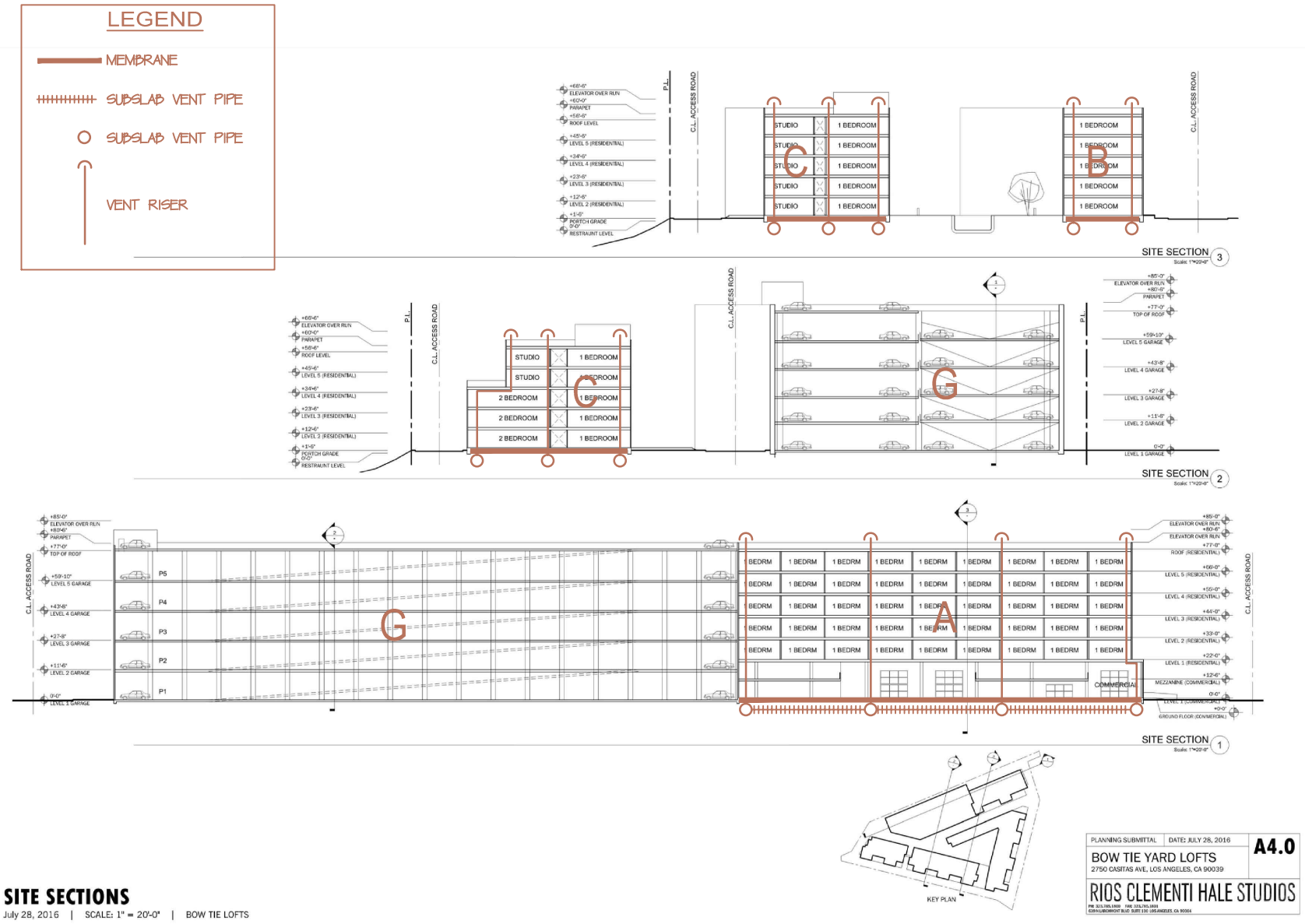
PLOT PLAN

July 27, 2016 | SCALE: 1/32" = 1'-0" | BOW TIE YARD LOFTS

0' 25' 50' 100'

SOIL VAPOR MITIGATION - KEY MAP

BROWNFIELD SUBSLAB / jesepich@gmail.com



SITE SECTIONS

July 28, 2016 | SCALE: 1" = 20'-0" | BOW TIE LOFTS

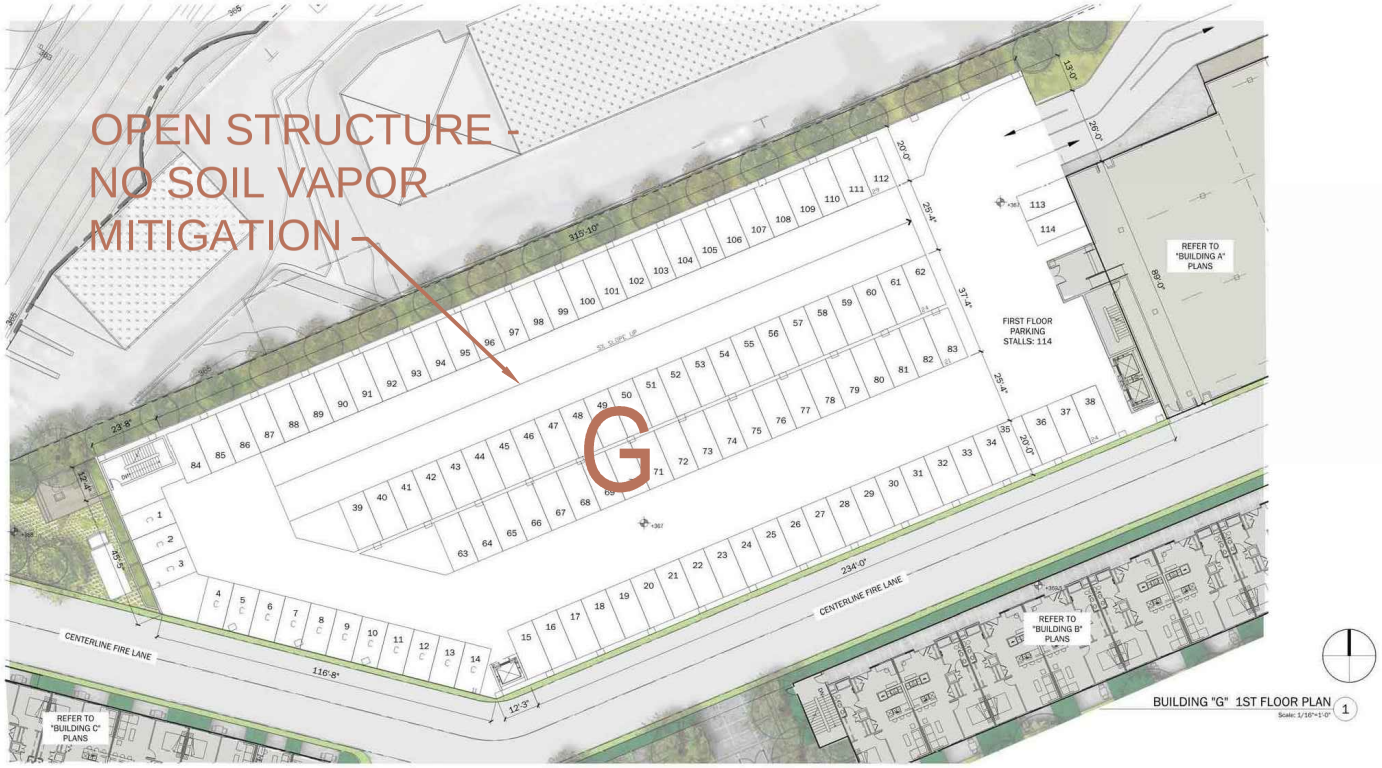
PLANNING SUBMITTAL | DATE: JULY 28, 2016 | **A4.0**

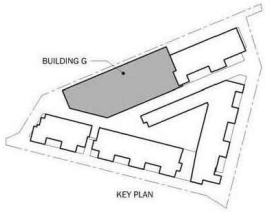
BOW TIE YARD LOFTS
2750 CASITAS AVE, LOS ANGELES, CA 90039

RIOS CLEMENTI HALE STUDIOS

SOIL VAPOR MITIGATION - SECTIONS

BROWNFIELD SUBSLAB / jesepich@gmail.com





PLANNING SUBMITTAL	DATE: JULY 28, 2016	A2.10
BOW TIE YARD LOFTS 2750 CASITAS AVE, LOS ANGELES, CA 90039		
RIOS CLEMENTI HALE STUDIOS		

BUILDING "G" FLOOR PLANS

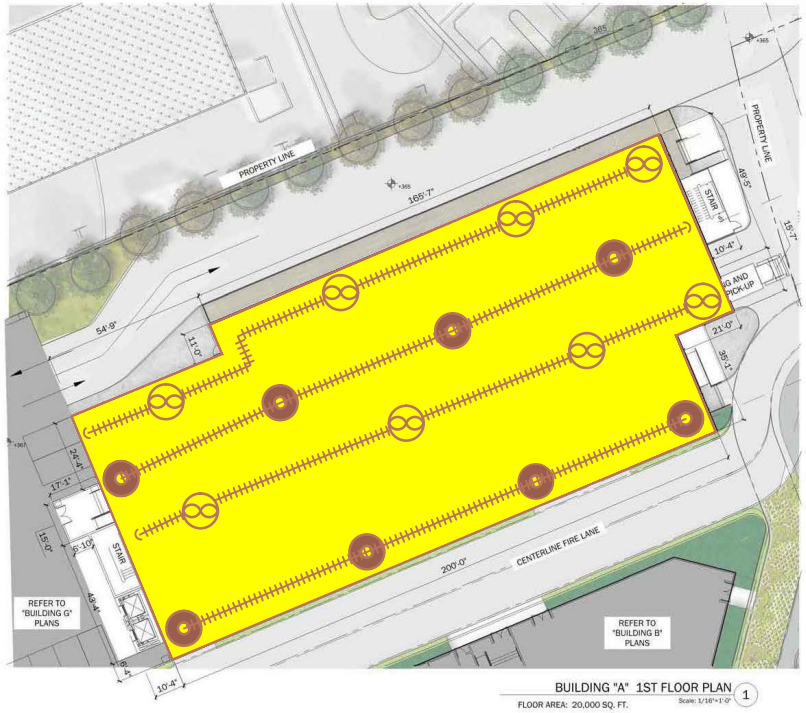
JULY 27, 2016 | SCALE: 1/16" = 1'-0" | BOW TIE YARD LOFTS

0' 25' 50' 100'

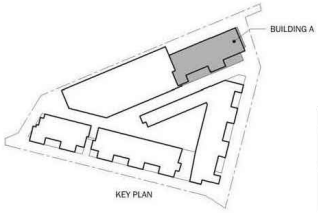
SOIL VAPOR MITIGATION - BUILDING G

LEGEND

- VENT TRENCH
- VENT RISER
- VENT RISER WITH FAN
- MONITORING PROBE PAIR
- MEMBRANE AREA



BUILDING "A" 1ST FLOOR PLAN (1)
FLOOR AREA: 20,000 SQ. FT.
Scale: 1/16"=1'-0"



PLANNING SUBMITTAL	DATE: JULY 28, 2016	A2.0
BOW TIE YARD LOFTS 2750 CASITAS AVE, LOS ANGELES, CA 90039		
RIOS CLEMENTI HALE STUDIOS		

BUILDING "A" FLOOR PLANS
JULY 27, 2016 | SCALE: 1/16" = 1'-0" | BOW TIE YARD LOFTS

0' 25' 50' 100'

SOIL VAPOR MITIGATION - BUILDING A

BROWNFIELD SUBSLAB / jesepich@gmail.com

BUILDING "B" FLOOR PLANS

JULY 27, 2016 | SCALE: 1/16" = 1'-0" | BOW TIE YARD LOFTS

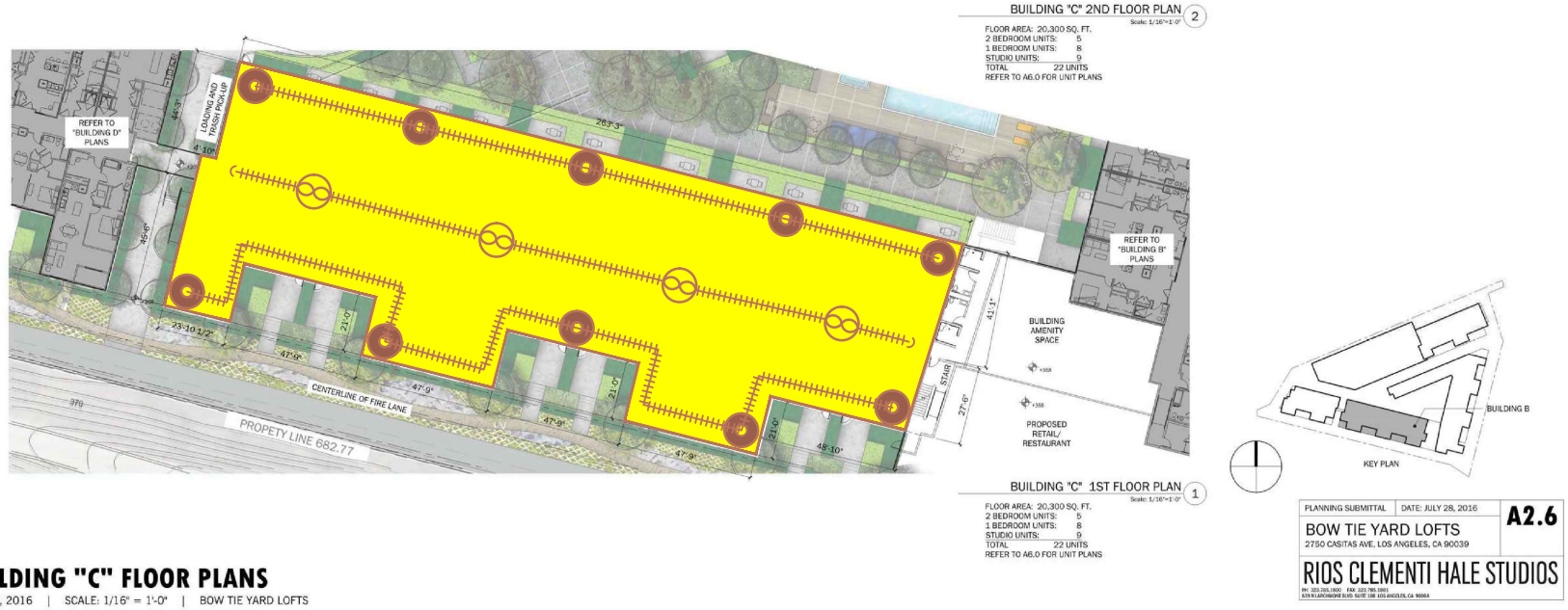
0' 25' 50' 100'

SOIL VAPOR MITIGATION - BUILDING B

BROWNFIELD SUBSLAB / jesepich@gmail.com

LEGEND

- VENT TRENCH
- VENT RISER
- VENT RISER WITH FAN
- MONITORING PROBE PAIR
- MEMBRANE AREA



BUILDING "C" FLOOR PLANS

JULY 27, 2016 | SCALE: 1/16" = 1'-0" | BOW TIE YARD LOFTS

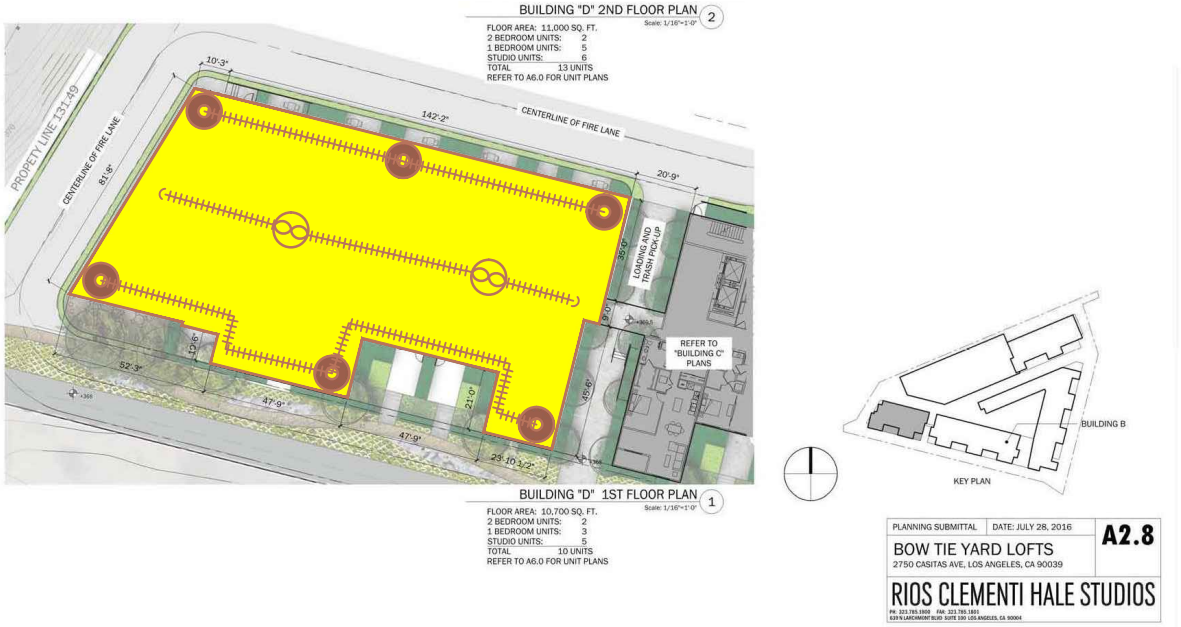
0' 25' 50' 100'

SOIL VAPOR MITIGATION - BUILDING C

BROWNFIELD SUBSLAB / jesepich@gmail.com

LEGEND

- VENT TRENCH
- VENT RISER
- VENT RISER WITH FAN
- MONITORING PROBE PAIR
- MEMBRANE AREA



BUILDING "D" FLOOR PLANS

JULY 27, 2016 | SCALE: 1/16" = 1'-0" | BOW TIE YARD LOFTS

0' 25' 50' 100'

SOIL VAPOR MITIGATION - BUILDING D

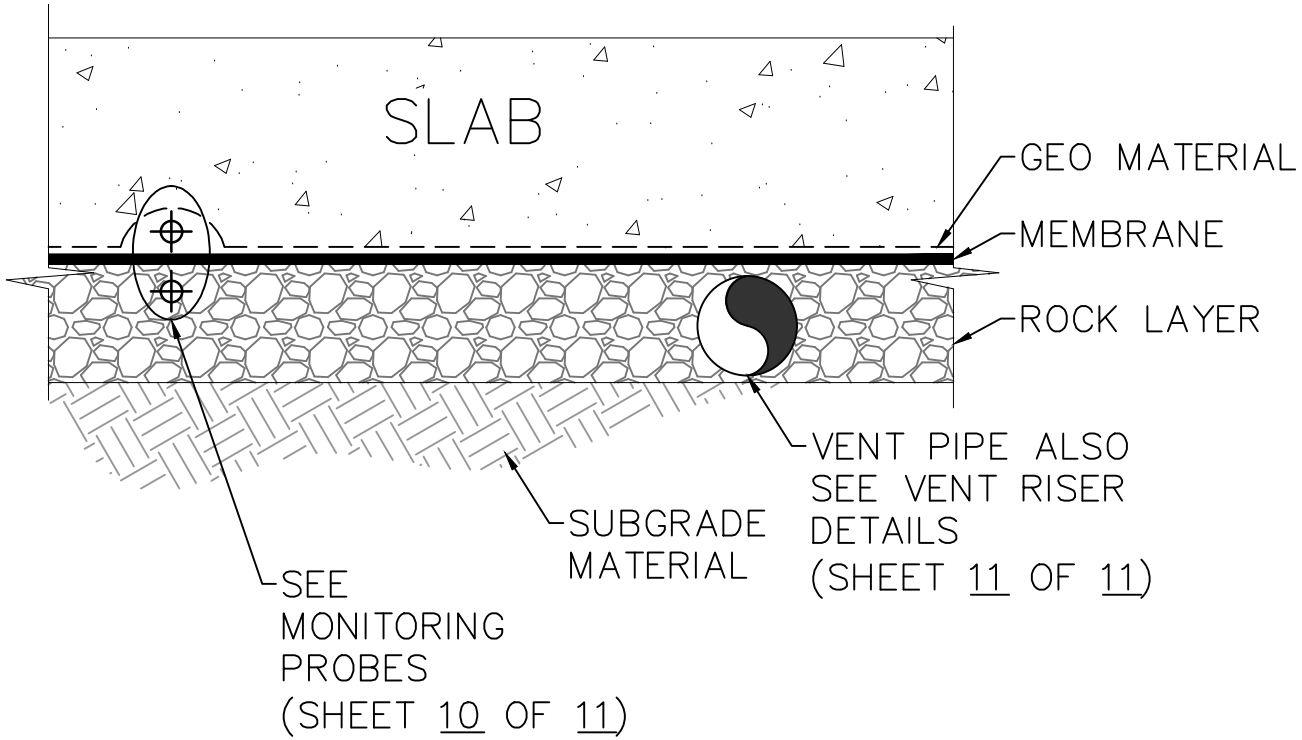
PLOT PLAN

July 27, 2016 | SCALE: 1/32" = 1'-0" | BOW TIE YARD LOFTS

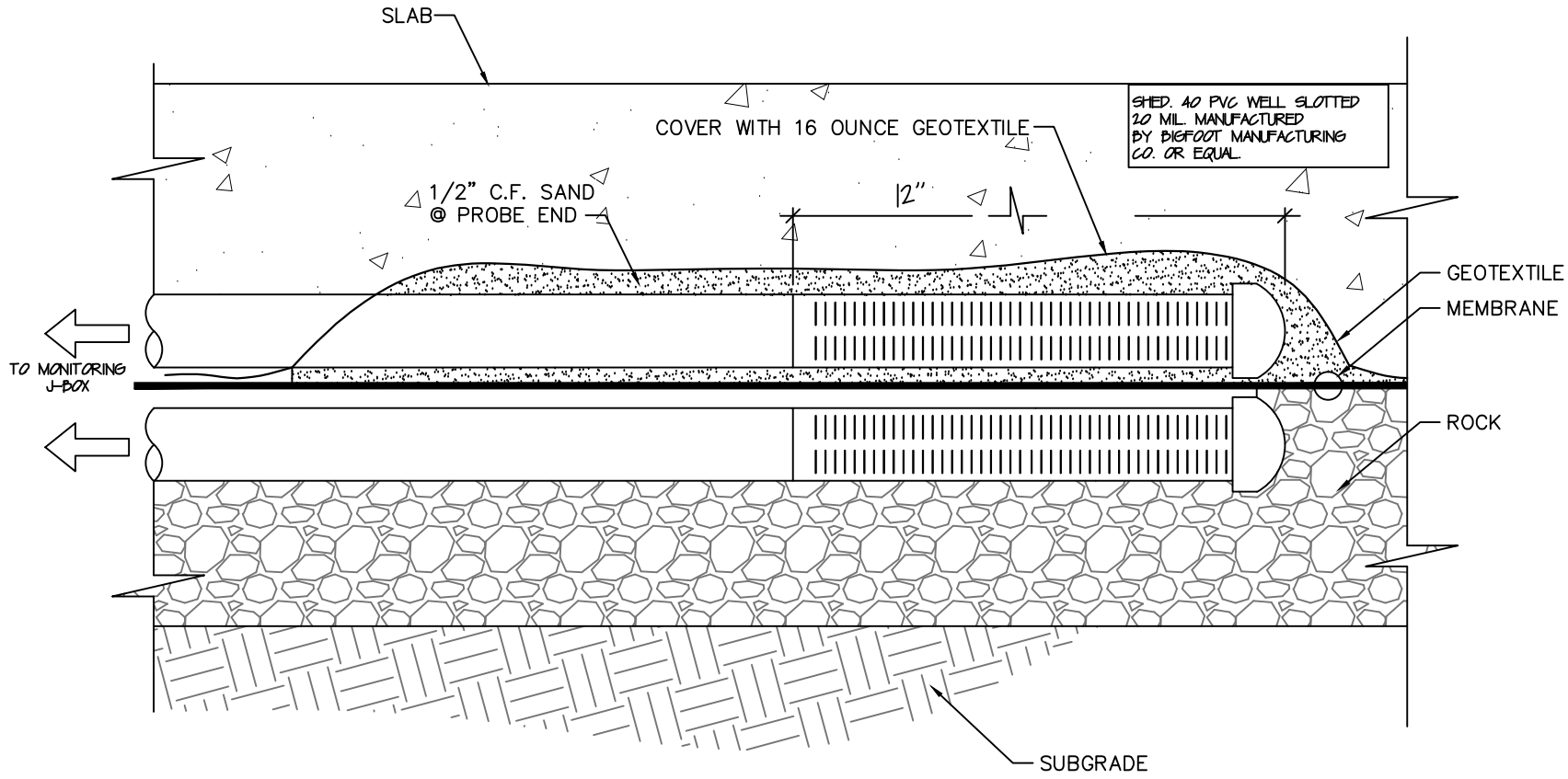
0' 25' 50' 100'

SOIL VAPOR MITIGATION - MONITORING PROBE MAP

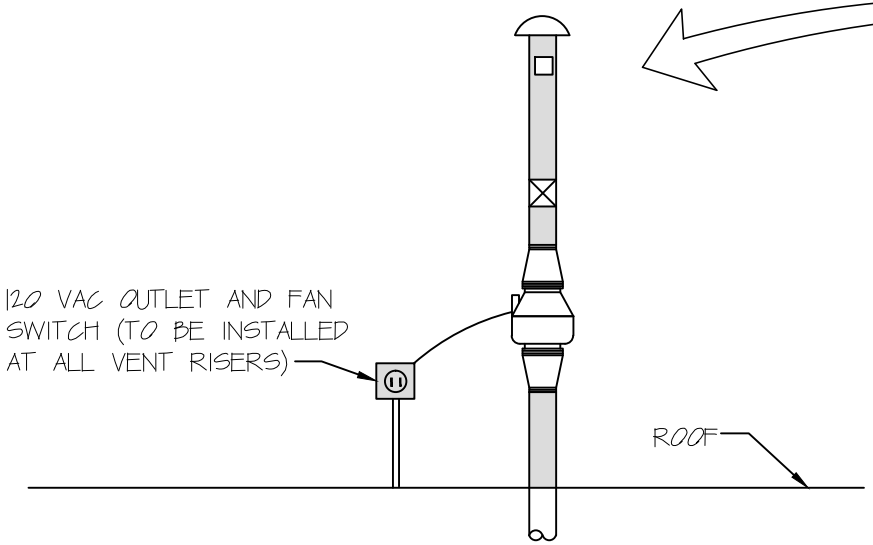
BROWNFIELD SUBSLAB / jesepich@gmail.com



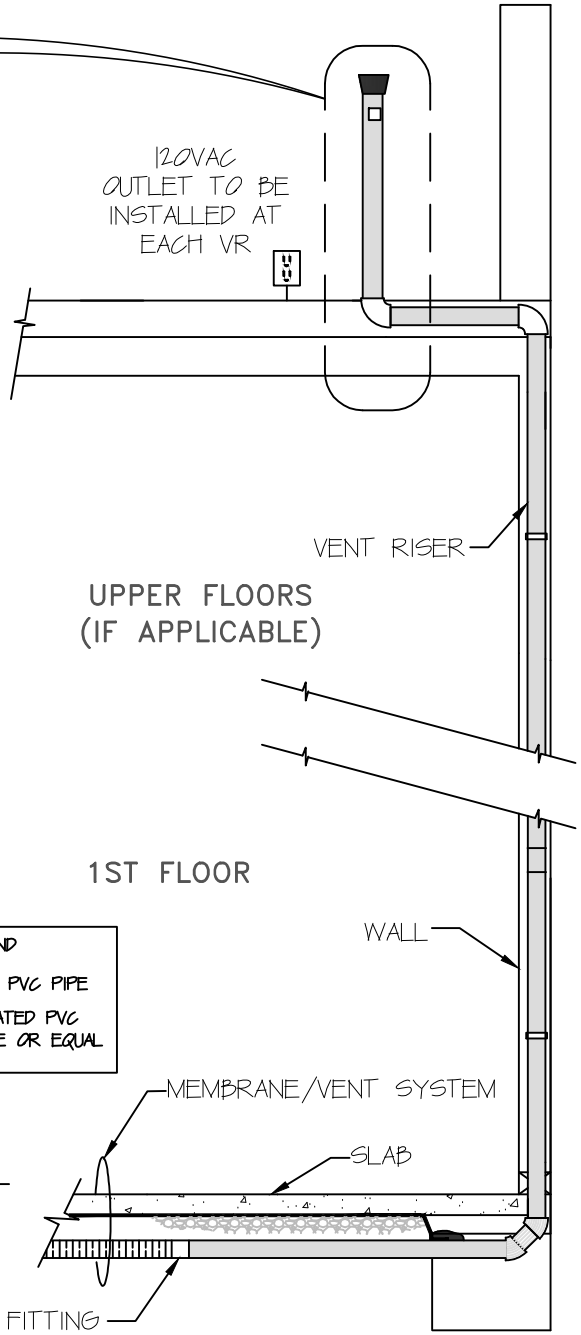
SOIL VAPOR MITIGATION - SUBSLAB SYSTEM



SOIL VAPOR MITIGATION - VENT RISERS



ACTIVE



PIPE LEGEND

SCH. 40 PVC PIPE

PERORATED PVC VENT PIPE OR EQUAL

PASSIVE

SOIL VAPOR MITIGATION - VENT RISERS

BROWNFIELD SUBSLAB / jesepich@gmail.com