ERR Adoption Memorandum

Date: August 25, 2021

To: File – Environmental Review Record (ERR)

From: William Gilchrist, Director
City of Oakland, Planning and Building Department and NEPA Certifying Officer

In RE: ***Adoption of the existing 2016 NEPA Environmental Assessment with Supplemental Analysis and Information for Veterans Square, 901 Los Medanos Street and 295 East 10th Street, Pittsburg, California***

Background

Satellite Affordable Housing Associates proposes to develop the Veterans Square project in the City of Pittsburg, California, on two distinct, non-contiguous parcels with address 901 Los Medanos Street and 295 East 10th Street. The project is the new construction of affordable housing on 901 Los Medanos Street, consisting of 30 units in a three-story building. An Environmental Assessment was conducted in 2016 by De Novo Planning Group.

Subsequent to the initial Environmental Assessment, an additional parcel was added to the project and will be developed as parking. The address of the additional lot is 295 East 10th Street in Pittsburg, CA, across the street from the housing portion. This lot is vacant and has exposed soil/vegetation. AEM Consulting prepared a Re-Evaluation document in June 2019.

Both the original Environmental Assessment and the Re-evaluation Memorandum were signed by the NEPA Certifying Officer, Gabriel Lemus, for Contra Costa County. The County published a *Finding of No Significant Impact and Notice of Intent to Request Release of Funds* and subsequently received an *Authority to Use Grant Funds* on May 31, 2016.

Federal Action

On June 10, 2021, the project was awarded funds from the Housing Opportunities for Persons with AIDS (HOPWA) program, a program of U.S. Department of Housing and Urban Development (HUD), in the amount of $400,000. The City of Oakland is the designated Responsible Entity (RE) for HOPWA funds, as designated by the Alameda County HOME Consortium.

ERR Adoption

The City of Oakland reviewed all the documents in the County's Environmental Review Record (ERR) including the original 2016 Environmental Assessment, Mitigation Measures and the Re-evaluation Memorandum for completeness in July and August 2021. The City of Oakland found several deficiencies during the review of the proposed ERR for adoption by the City. These deficiencies, updated analysis, and supporting documentation are discussed in this memorandum and attached.

Attachment (1) contains the Mitigation Measures that will be required of the developer to implement the project.

As this supplemental information completes the Environmental Review Record to the satisfaction of the City of Oakland, as NEPA Certifying Officer, I declare the following:

I certify that I have completed this review and prepared the environmental findings and determinations where applicable. Since information was supplied by another party, in this instance, another consultant and another RE (Contra Costa County), I have independently evaluated the information for accuracy and supplemented it, as necessary, to conform to the requirements of 24 CFR Part 58.

A Finding of No Significant Impact on the Environment and Notice of Intent to Request Release of Funds *will be prepared and published.*

RE Approving Official Signature:

William Gilchrist _____ Date: Aug 25, 2021

William Gilchrist, Director
City of Oakland, Planning and Building Department and NEPA Certifying Officer

attachments

Supplemental Analysis/ERR Review

Compliance with 24 CFR 50.4, 58.5, and 58.6 Laws and Authorities

Record below the compliance or conformance determinations for each statute, executive order, or regulation. Provide credible, traceable, and supportive source documentation for each authority. Where applicable, complete the necessary reviews or consultations and obtain or note applicable permits of approvals. Clearly note citations, dates/names/titles of contacts, and page references. Attach additional documentation as appropriate.

Compliance Factors: Statutes, Executive Orders, and Regulations listed at 24 CFR §58.5 and §58.6	Are formal compliance steps or mitigation required?	Compliance determinations
STATUTES, EXECUTIVE ORDERS, AND REGULATIONS LISTED AT 24 CFR 50.4 and 58.6		
Airport Hazards 24 CFR Part 51 Subpart D	Yes ☐ No ☒	**Thresholds of Significance:** Project site within 15,000 feet of a military airport or 2,500 feet of a civilian airport. **Analysis:** There are no airports within nine miles. **Finding:** Source documentation is in compliance.
Coastal Barrier Resources Coastal Barrier Resources Act, as amended by the Coastal Barrier Improvement Act of 1990 [16 USC 3501]	Yes ☐ No ☒	The Coastal Barrier Resources Act of the United States (CBRA, Public Law 97-348), enacted October 18, 1982, designated various undeveloped coastal barriers, depicted by a set of maps adopted by law, for inclusion in the John H. Chafee Coastal Barrier Resources System (CBRS). Areas so designated were made ineligible for direct or indirect Federal national security, navigability, and energy exploration. CBRS areas extend along the coasts of the Atlantic Ocean and the Gulf of Mexico, Puerto Rico, the U.S. Virgin Islands, and the Great Lakes, and consist of 857 units. There are no Coastal Barrier Resources in California.
Flood Insurance	Yes ☐ No ☒	**Threshold of Significance:** Critical Actions in a 500-year floodplain or any other project in a 100-year floodplain.

Compliance Factors: Statutes, Executive Orders, and Regulations listed at 24 CFR §58.5 and §58.6	Are formal compliance steps or mitigation required?	Compliance determinations
Flood Disaster Protection Act of 1973 and National Flood Insurance Reform Act of 1994 [42 USC 4001-4128 and 42 USC 5154a]		**Analysis**: The Project's parcels are outside of the 100-year and 500-year floodplains. **Finding**: Source documentation is in compliance.
STATUTES, EXECUTIVE ORDERS, AND REGULATIONS LISTED AT 24 CFR 50.4 & 58.5		
Clean Air Clean Air Act, as amended, particularly section 176(c) & (d); 40 CFR Parts 6, 51, 93	Yes ☒ No ☐	The following is supplemental information to the EA and Re-evaluation. The federal Clean Air Act governs air quality in the United States. The U.S. Environmental Protection Agency (US EPA) administers the Clean Air Act, which requires each state to identify those areas that have ambient air quality in violation of federal standards. States are required to develop, adopt and implement a State Implementation Plan (SIP) to achieve, maintain and enforce federal ambient air quality standards in nonattainment areas. SIP's are developed on a pollutant-by-pollutant basis whenever one or more federal air quality standards are violated. State law makes the California Air Resources Board (CARB) the lead agency for all purposes related to the SIP, and CARB is tasked with developing and adopting the specific rules and regulations needed to achieve healthful air quality that meets these national standards, as well as the more stringent State standards. CARB partners with the State's 35 regional and local Air Districts to conduct air quality planning, monitoring and stationary source and facility permitting. These regional and local Air Districts have primary responsibility for developing SIPs, generally in coordination with local and regional land use and transportation planning agencies. The Bay Area Air Quality Management District (BAAQMD) is the responsible regional air pollution control agency in the nine-county San Francisco Bay Area region.

Compliance Factors: Statutes, Executive Orders, and Regulations listed at 24 CFR §58.5 and §58.6	Are formal compliance steps or mitigation required?	Compliance determinations
		An area's compliance with national ambient air quality standards under the Clean Air Act is generally categorized as either attainment (i.e., better than national standards) or non-attainment (i.e., not meeting national standards). Other potential categories include "maintenance area", "unclassifiable" or "attainment/cannot be classified". The San Francisco Bay Area Air Basin (Bay Area Air Basin) is designated as non-attainment for the federal 8-hour ozone standard and the federal 24-hour fine particulate matter (PM2.5) standard, and is designated as a maintenance area with respect to the federal carbon monoxide (CO) standards. The Bay Area Air Basin is designated as attainment or unclassified for all other national ambient air quality standards. The predominant regulation that guides assessment of air quality impacts of federal actions is the General Conformity Rule, established under the Clean Air Act (Section 176(c)(4)). The General Conformity Rule ensures that the actions taken by federal agencies in non-attainment and maintenance areas do not interfere with a state's plans to meet national standards for air quality. In keeping with the General Conformity Rule process, the following assessment of the Project relies on the "de minimis" thresholds of the General Conformity Rule as they apply to the Bay Area Air Basin for ozone precursors, PM2.5 and CO. The federal de minimis thresholds for these three pollutants in the Bay Area Air Basin are 100 tons per year for each pollutant. The applicable BAAQMD air quality standards addressing the Bay Area Air Basin's non-attainment status for ozone (including ozone precursors, or criteria pollutants of NOx, ROG, PM10, and PM2.5) and 24-hour fine particulate matter (PM2.5), are established pursuant to the BAAQMD's 2017 Clean Air Plan, and are more stringent than the federal standards. Any federal action that is consistent with the primary goals of the BAAQMD 2017 Clean Air Plan pertaining to criteria pollutants and fine particulate matter would not interfere with the SIP plans for meeting the national standards, and any project that would support the goals of the 2017 CAP to attain statewide air quality standards would be considered consistent with the 2017 CAP. BAAQMD's recommended approach for determining a project's consistency with the 2017 CAP is its consistency with District-approved CEQA thresholds of significance. If a project

<table>
<tr><th>Compliance Factors: Statutes, Executive Orders, and Regulations listed at 24 CFR §58.5 and §58.6</th><th>Are formal compliance steps or mitigation required?</th><th>Compliance determinations</th></tr>
<tr><td></td><td></td><td>would not exceed the applicable CEQA thresholds after the application of all feasible mitigation, the project would be considered consistent with the 2017 CAP, and would not interfere with the SIP for meeting the national air quality standards. The BAAQMD air quality thresholds used in this analysis to evaluate air quality impacts of criteria pollutants for consistency with the 2017 CAP and for general conformity with the SIP are listed below:

Thresholds of Significance: The Project's estimated emissions could exceed de minimis emission levels for nonattainment and/or maintenance level pollutants (ozone precursors and fine particulate matter).

Project-Level
Criteria Pollutant Thresholds
<table>
<tr><th>Criteria Pollutant</th><th>Construction Average Daily Emissions (pounds per day)</th><th>Operational Average Daily Emissions (pounds per day)</th><th>Operational Max Annual Emissions (tons per year)</th></tr>
<tr><td>VOC</td><td>54</td><td>54</td><td>10</td></tr>
<tr><td>NOx</td><td>54</td><td>54</td><td>10</td></tr>
<tr><td>PM_{10}</td><td>82 (exhaust)</td><td>82</td><td>15</td></tr>
<tr><td>$PM_{2.5}$</td><td>54 (exhaust)</td><td>54</td><td>10</td></tr>
<tr><td>$PM_{10}/PM_{2.5}$ (fugitive dust)</td><td>Best Management Practices</td><td>None</td><td>None</td></tr>
<tr><td>Local CO</td><td>None</td><td colspan="2">9.0 ppm (8-hour average), 20.0 ppm (1-hour average)</td></tr>
</table>
</td></tr>
</table>

Compliance Factors: Statutes, Executive Orders, and Regulations listed at 24 CFR §58.5 and §58.6	Are formal compliance steps or mitigation required?	Compliance determinations

Risk and Hazards Thresholds – Construction and Operations[2]

Risk and Hazards	Individual Project	Cumulative Threshold
Cancer Risk	10 in a million	100 in a million
Chronic or Acute Risk	1.0 hazard index	10.0 hazard index
$PM_{2.5}$	0.3 µg/m³	0.8 µg/m³

Greenhouse Gas Thresholds – Operational Only[3]

Greenhouse Gases	Projects other than Stationary Sources	Stationary Sources
GHG Emissions (including CO_2, CH_4, N_2O, HFCs, PFCs, SF_6)	Compliance with Qualified GHG Reduction Plan or 1,100 MT CO_2e per year or 4.6 MT CO_2e per service population per year	10,000 MT per year

Source: Bay Area Air Quality Management District (BAAQMD) CEQA Thresholds of Significance (CEQA Guidelines May 2017.

Analysis:

TAC Assessment

Compliance Factors: Statutes, Executive Orders, and Regulations listed at 24 CFR §58.5 and §58.6	Are formal compliance steps or mitigation required?	Compliance determinations

Veterans Square - Screening for Exposure of Sensitive Receptors to Cancer, Hazard, and PM2.5 Risks

Site Identifier	Cancer	Hazard	PM2.5
G8534 (City of Pittsburg corps yard - used G11000 as proxy since no data for City yard)	1.3364	0.00191	NA
7306 - Jon Stanley Auto Body	0	0.003	0
12080- Russo Auto Body	0	0.001	0
19524 - West Coast Autobody/Paint	NA	NA	NA
19524 Proxy (used highest of 7306 John Stanley Auto Body, 17111 Collision Repair, 12950 Universal	0	0.003	0
G11000 - Redding Petroleum (adjusted for distance from site)	1.3364	0.00191	0
Railroad Ave (project 610 ft west of roadway, Railroad Ave has approx. 13,500 daily vehicle trips)	0.5	0	0.013
Cumulative Exposure	***3.1728***	***0.00982***	***0.013***
Individual Project Threshold [a],[b],[c]	*10*	*1*	*0.3*
Cumulative Impact Threshold [d],[e],[f]	***100***	***1***	***0.8***
Exceeds Cumulative Impact Threshold?	**No**	**No**	**No**

Note: Cumulative impact thresholds can be found on pg. 6 of the BAAQMD's *Recommended Methods for Screening and Modeling Local Risks*
BAAQMD individual risk thresholds (from the highest source within 1,000 foot radius of the receptor): [a]cancer risk of >10 in a million;
[b]Cumulative chronic and acute hazard risk of >1.0; [c]Cumulative PM2.5 concentration of >0.8 micrograms/cubic meter
BAAQMD Cumulative risk thresholds (includes all major sources within 1,000 foot radius of the receptor): [d]Cumulative cancer risk of >10 in a

A review of the Project site identifies seven air pollutant or TAC sources within 1,000 feet of the site. The calculation of maximum cancer risk impacts resulting from TAC emissions from these sources is under both the individual and cumulative threshold. The TAC assessment shows that future residents will not be exposed to excess cancer risks.

Criteria Air Pollutants and Precursors

The screening criteria developed for criteria pollutants and precursors were derived using the default assumptions used by the Urban Land Use Emissions Model (URBEMIS). If the project has sources of emissions not evaluated in the URBEMIS program, the screening criteria should not be used. If the project meets the screening criteria in Table 3-1 below, the project would not result in the generation of operational-related criteria air pollutants and/or precursors that exceed the Thresholds of Significance shown above. Operation of the proposed project would, therefore, result in a less-than-significant cumulative impact to air quality from criteria air pollutant and precursor emissions.

Compliance Factors: Statutes, Executive Orders, and Regulations listed at 24 CFR §58.5 and §58.6	Are formal compliance steps or mitigation required?	Compliance determinations
		Greenhouse Gases The screening criteria developed for greenhouse gases were derived using the default emission assumptions in URBEMIS and using off-model GHG estimates for indirect emissions from electrical generation, solid waste, and water conveyance. If the project has other significant sources of GHG emissions not accounted for in the methodology described above, then the screening criteria should not be used. Projects below the applicable screening criteria shown in Table 3-1 below would not exceed the 1,100 MT of CO2e/yr GHG threshold of significance for projects other than permitted stationary sources. **Operational and Construction-related Emissions Screening Table:**

Table 3-1
Operational-Related Criteria Air Pollutant and Precursor Screening Level Sizes

Land Use Type	Operational Criteria Pollutant Screening Size	Operational GHG Screening Size	Construction-Related Screening Size
Single-family	325 du (NOX)	56 du	114 du (ROG)
Apartment, low-rise	451 du (ROG)	78 du	240 du (ROG)
Apartment, mid-rise	494 du (ROG)	87 du	240 du (ROG)
Apartment, high-rise	510 du (ROG)	91 du	249 du (ROG)

Source: BAAQMD CEQA Guidelines, May 2017.

At 30 units of low-rise apartments, the project is well below the Screening Level size of 240 dwelling units (du) for construction-related emissions, 451 dwelling units (du) for operational criteria pollutants, and below 78 du for operational greenhouse gas emissions.

Further analysis with CalEEMod is not indicated.

Future residents are not exposed to excess cancer risks. Construction and operation of the project will not result in significant emissions or greenhouse gas emissions.

Compliance Factors: Statutes, Executive Orders, and Regulations listed at 24 CFR §58.5 and §58.6	Are formal compliance steps or mitigation required?	Compliance determinations
		Finding: Source documentation is in compliance. Mitigation MM-2 is required for dust control during construction. Mitigation MM-3, although not required for exposure to toxic air contamination, requires mechanical ventilation to be installed in all residential uses to allow residents to keep doors and windows closed which will improve indoor air quality. Attachment (2)
Coastal Zone Management Coastal Zone Management Act, sections 307(c) & (d)	Yes ☐ No ☒	**Threshold of Significance**: If the project is located in a Coastal Zone Management area that would require a Coastal Development Permit. **Analysis**: Below is confirmation of the distance to the nearest body of water. 

Compliance Factors: Statutes, Executive Orders, and Regulations listed at 24 CFR §58.5 and §58.6	Are formal compliance steps or mitigation required?	Compliance determinations
		The site is not within 100 feet of the shoreline; therefore, a Coastal Development Permit is not required. The site is zoned Downtown High Density (see attached map). **Finding**: Source documentation is in compliance. Attachment (3)
Contamination and Toxic Substances 24 CFR Part 50.3(i) & 58.5(i)(2)	Yes ☐ No ☒	**Threshold of Significance**: Site unsuitable for residential development based on contamination. **Analysis**: Adequate Phase I Environmental Site Assessment reports were provided that show no Recognized Environmental Conditions (RECs) at the site. As this ERR is provided for adoption of another Responsible Entity's NEPA Environmental Assessment and supporting documentation, a current Phase I ESA is not indicated. **Finding**: Source documentation is in compliance.
Endangered Species Endangered Species Act of 1973, particularly section 7; 50 CFR Part 402	Yes ☒ No ☐	**Threshold of Significance**: Project results in adverse effects or may adversely affect listed plants and animals. **Analysis**: A Biological Assessment was prepared that documents no effect to listed species. **Finding**: Source documentation is in compliance. MM-19 is required for the protection of nesting birds and migratory birds during construction.
Explosive and Flammable Hazards 24 CFR Part 51 Subpart C	Yes ☐ No ☒	**Threshold of Significance**: Residents within blast radius of above ground storage tanks (ASTs). **Analysis**: Documentation provided shows that there are ASTs near the site. The Acceptable Separation Distance Tool (ASD) was used and demonstrates that people and buildings would be outside of the calculated blast overpressure and thermal radiation impacts.

Compliance Factors: Statutes, Executive Orders, and Regulations listed at 24 CFR §58.5 and §58.6	Are formal compliance steps or mitigation required?	Compliance determinations
		Finding: Source documentation is in compliance.
Farmlands Protection Farmland Protection Policy Act of 1981, particularly sections 1504(b) and 1541; 7 CFR Part 658	Yes ☐ No ☒	**Threshold of Significance**: Conversion of Prime Farmland to residential uses. **Analysis**: The project site is not located in Prime Farmlands and will not result in a loss of Prime Farmland. **Finding**: Source documentation is in compliance.
Floodplain Management Executive Order 11988, particularly section 2(a); 24 CFR Part 55	Yes ☐ No ☒	**Threshold of Significance**: Critical Action in a 500-year floodplain or any other project in a 100-year floodplain. **Analysis**: The project's parcels are outside of the 100-year and 500-year floodplain. **Finding**: Source documentation is in compliance.
Historic Preservation National Historic Preservation Act of 1966, particularly sections 106 and 110; 36 CFR Part 800	Yes ☒ No ☐	**Threshold of Significance**: Adverse impacts to properties eligible for listing or listed on the National Register of Historic Properties. **Analysis**: Documentation provided includes a consultation with the State Historic Preservation Officer and supplemental consultation with the additional project parcel added. Consultation resulted in no objection to the finding of no historic properties affected by the undertaking. **Finding**: Source documentation is in compliance. MM-1 is required for the protection of any buried cultural resources discovered accidentally during construction.
Noise Abatement and Control Noise Control Act of 1972, as amended by the Quiet	Yes ☒ No ☐	The U.S. Department of Housing and Urban Development (HUD) environmental noise regulations are set forth in 24CFR Part 51B (Code of Federal Regulations). The following exterior noise standards for new housing construction would be applicable to this project: • 65 dBA DNL or less – acceptable.

Compliance Factors: Statutes, Executive Orders, and Regulations listed at 24 CFR §58.5 and §58.6	Are formal compliance steps or mitigation required?	Compliance determinations
Communities Act of 1978; 24 CFR Part 51 Subpart B		• Exceeding 65 dBA DNL but not exceeding 75 dBA DNL – normally unacceptable (appropriate sound attenuation measures must provide an additional 5 decibels of attenuation over that typically provided by standard construction in the 65 dBA DNL to 70 dBA DNL zone; 10 decibels additional attenuation in the 70 dBA DNL to 75 dBA DNL zone). • Exceeding 75 dBA DNL – unacceptable. **Threshold of Significance**: Residential development in an area with a projected future noise environment of 65 dBA CNEL or above. **Analysis**: Year 2030 data was provided by the NEPA Noise Study conducted for the project by J.C. Brennan & Associates, Inc. The future noise environment was predicted to be up to 67 dBA DNL. Mechanical ventilation was indicated as mitigation in the EA due to the traffic and railroad noise. The current noise environment measured exposure of the site at 60 dBA Ldn. **Outdoor Common Spaces** AEM Consulting entered the numbers provided in the noise study for year 2030 into the HUD DNL Calculator Tool. The Tool confirmed the projected future noise environment is expected to be up to 67 dBA CNEL. AEM estimated the future noise environment for the common outdoor space using HUD's DNL Calculator Tool. The future noise environment at the common outdoor space was also estimated to be up to 67 dBA CNEL. The common outdoor space will be shielded from the BNSF rail operations by a one-story building that lies to the south of the parcel; traffic along East 10th Street will be shielded by the subject three-story building. Using HUD's Barrier Performance Module for both noise sources, the common outdoor space is estimated to be below 65 dBA CNEL and "Acceptable" to HUD noise standards

Compliance Factors: Statutes, Executive Orders, and Regulations listed at 24 CFR §58.5 and §58.6	Are formal compliance steps or mitigation required?	Compliance determinations
		Indoor Spaces The noise study in the EA made the following conclusion and analysis of architectural attenuation: *"Under the HUD criteria, an exterior noise exposure in the 65-70 dB Ldn range requires that an additional 5 dB of sound attenuation must be provided over the attenuation provided by standard construction (windows open). HUD assumes that standard construction provides an average of 20 dB of attenuation. Therefore, a total exterior-to-interior noise level reduction of 25 dB would be required. This reduction can be achieved by ensuring that mechanical ventilation is provided so that occupants can keep windows closed for acoustical isolation."* If interiors are to be 45 dBA CNEL or less, and attenuation provided with windows closed MM-3) is 25 dBA CNEL and the noise exposure is 67 dBA CNEL, interiors are expected to be 42 dBA CNEL, which is 'Acceptable' to HUD standards. The Noise Study analysis is confirmed. **Construction and Operational Noise** The project will be required to adhere to the City of Pittsburg's municipal code for restriction on construction days and hours, as well as residential noise standards. This is a standard permit condition that will be enforced by the City of Pittsburg. The existing noise environment was measured at 60 dBA Ldn on Los Medanos Avenue. The parking lot has 26 parking spaces; the housing site has 4 spaces, for a total of 30 parking spaces. The following trip generation rates are estimated for the 30 residential units.

<table>
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<tr><td></td><td></td><td>Table 1 Trip Generation Rates
<table><tr><th>Land Use – ITE 220</th><th>ADT</th><th>AM Peak Hour</th><th>PM Peak hour</th></tr><tr><td>Affordable Housing</td><td>123</td><td>15</td><td>11</td></tr></table>
Using HUD's DNL Calculator Tool, these trips will generate an estimated 36 dBA CNEL. If you combine that with the existing noise (60 dBA Ldn), the combined noise is 60 dBA CNEL; combining with the future noise environment (67 dBA CNEL), the future noise environment is still 67 dBA CNEL.

The impacts of 30 parking spaces for the units to ambient noise in the vicinity is negligible.

Finding: MM-3 is required to provide mechanical ventilation. Source documentation is in compliance.

Attachments (4) (5) (6) (7) (8) (9)</td></tr>
<tr><td>**Sole Source Aquifers**

Safe Drinking Water Act of 1974, as amended, particularly section 1424(e); 40 CFR Part 149</td><td>Yes ☐ No ☒</td><td>**Threshold of Significance**: Impact to a Sole Source Aquifer subject to an MOU, as a result of the project.

Analysis: There are no Sole Source Aquifers in Contra Costa County.

Finding: No impact. Source documentation is in compliance.</td></tr>
<tr><td>**Wetlands Protection**

Executive Order 11990, particularly sections 2 and 5</td><td>Yes ☐ No ☒</td><td>**Threshold of Significance:** The presence of wetlands invokes compliance with EO 11990.

Analysis: There are no wetlands on either parcel. This is confirmed with field survey and the National Wetlands Inventory tool.</td></tr>
</table>

Compliance Factors: Statutes, Executive Orders, and Regulations listed at 24 CFR §58.5 and §58.6	Are formal compliance steps or mitigation required?	Compliance determinations
		Finding: No wetlands are present. Source documentation is in compliance.
Wild and Scenic Rivers Wild and Scenic Rivers Act of 1968, particularly section 7(b) and (c)	Yes ☐ No ☒	**Threshold of Significance**: Project has the potential to impact Wild and Scenic Rivers. **Analysis**: No wild and scenic rivers are located within Alameda County. **Finding**: No impact. Source documentation is in compliance.
ENVIRONMENTAL JUSTICE		
Environmental Justice Executive Order 12898	Yes ☐ No ☒	**Threshold of Significance**: Disproportionate adverse effects to low-income and minority populations. **Analysis**: The following is supplemental information to the EA and Re-evaluation. According to the EJSCREEN Report, the neighborhood surrounding the project site (within a 1-mile radius) suffers from adverse environmental conditions related to air pollution and its resulting adverse health effects, ranking greater than the 92nd percentile nationally for DPM exposure and proximity to traffic emissions. The surrounding neighborhood is also subject to significant soil and groundwater contamination, ranking greater than the 90th percentile nationally for hazardous waste proximity, Superfund proximity, and lead-based paint indicators. The project would not create an adverse or disproportionate environmental impact, nor would it aggravate these air quality and hazardous conditions. Rather, the Project would provide an air filtration system for the building (due to traffic and railroad noise not exposure to toxic air contaminants) that is protective of the health of future residents. The project will implement Mitigation MM-2 is required for dust control during construction. The site contains no identified soil contaminants that necessitate remediation. The subject property is currently

Compliance Factors: Statutes, Executive Orders, and Regulations listed at 24 CFR §58.5 and §58.6	Are formal compliance steps or mitigation required?	Compliance determinations
		vacant land and lacks erected structures or buildings and lacks construction or demolition debris that might contain asbestos-containing materials or lead-containing materials. **Finding:** The project would not have a disproportionate adverse effect on low-income or minority populations, but would instead provide a beneficial contribution to needed affordable housing for cost-burdened households. Attachment (10)

Environmental Assessment Factors [24 CFR 58.40; Ref. 40 CFR 1508.8 &1508.27] *Recorded below is the qualitative and quantitative significance of the effects of the proposal on the character, features and resources of the project area. Each factor has been evaluated and documented, as appropriate and in proportion to its relevance to the proposed action. Verifiable source documentation has been provided and described in support of each determination, as appropriate. Credible, traceable and supportive source documentation for each authority has been provided. Where applicable, the necessary reviews or consultations have been completed and applicable permits of approvals have been obtained or noted. Citations, dates/names/titles of contacts, and page references are clear. Additional documentation is attached, as appropriate.* ***All conditions, attenuation or mitigation measures have been clearly identified.***

Impact Codes: Use an impact code from the following list to make the determination of impact for each factor.

(1) Minor beneficial impact
(2) No impact anticipated
(3) Minor Adverse Impact – May require mitigation
(4) Significant or potentially significant impact requiring avoidance or modification which may require an Environmental Impact Statement

Environmental Assessment Factor	Impact Code	Impact Evaluation
LAND DEVELOPMENT		
Conformance with Plans / Compatible Land Use and Zoning / Scale and Urban Design	2	Threshold of Significance: Incompatible land uses or incongruent scale and massing. Inappropriate urban design. Analysis: The site is zoned "Downtown High Density Residential" and allows the proposal. Finding: The project does not require a zone change or general plan amendment. Source documentation is in compliance.
Soil Suitability/ Slope/ Erosion/ Drainage/ Storm Water Runoff	3	Threshold of Significance: Project causes excessive or adverse offsite impacts, including erosion, runoff, siltation, or cause unstable slopes on or off site. Analysis: The following is supplemental information to the EA and Re-evaluation. The site and vicinity are flat. A Geotechnical report prepared in May 2019 by Rockridge Geotechnical determined that the site can be developed as planned, as long as the recommendations in the Geotechnical report are adhered to. Finding: Mitigation is needed to require the developer to follow recommendations in the Geotechnical report. MM-11 requires a Geotechnical report be submitted to the City of Pittsburg Engineering Department.

Environmental Assessment Factor	Impact Code	Impact Evaluation
		Compliance with NPDES permit requirements and MM-4 through MM-10 would ensure that the project would not have a significant effect on surface water runoff. The City of Oakland amends MM-11 to the following: MM-11 The developer shall submit to the Engineering Department, a current geotechnical report that substantiates the design features incorporated into this project including, but not limited to, grading activities, compaction requirements, utility construction, slopes, retaining walls, and roadway sections. The geotechnical report shall be submitted to the Engineering Department for review prior to the approval of any civil plans and issuance of any Engineering permits. (City of Pittsburg Condition 15). The applicant shall implement the recommendations contained in the approved report during project design and construction. Attachment (11)
Hazards and Nuisances including Site Safety and Noise	3	**Threshold of Significance:** Project results in hazards or nuisances. Site poses safety or noise hazards. **Analysis:** The only hazards posed by the project relate to seismicity and California Building Code standards that reduce risks to life and buildings to the extent practicable. Adherence to the Geotechnical report implements these Code standards and reduces risk. No other hazards were identified. **Finding:** Source documentation in compliance. Mitigation is needed to require the developer to follow recommendations in the Geotechnical report. MM-11 requires a geotechnical report be submitted to the City of Pittsburg Engineering Department. Attachment (11)
Energy Consumption	2	**Threshold of Significance:** Project causes the need for new energy generation facilities to be constructed.

Environmental Assessment Factor	Impact Code	Impact Evaluation
		Analysis: Project will comply with Title 24 at a minimum. Project does not invoke construction of new energy facilities. **Finding:** Source documentation is in compliance.
SOCIOECONOMIC		
Employment and Income Patterns	2	**Threshold of Significance:** Project results in significant impacts to socioeconomic factors. **Analysis:** The project will not result in dividing an established community; the project is not growth-inducing; the project is not of sufficient scope to impact employment or income patterns. **Finding:** Source documentation is in compliance.
Demographic Character Changes, Displacement	2	**Threshold of Significance:** Project results in significant impacts to socioeconomic factors. **Analysis:** The project will not result in dividing an established community; the project is not growth-inducing; the project is not of sufficient scope to impact employment or income patterns. The project does not displace residents or businesses. **Finding:** Source documentation is in compliance.
COMMUNITY FACILITIES AND SERVICES		
Educational and Cultural Facilities	2	**Threshold of Significance:** Project results in the need for the construction of additional schools. Project area lacks cultural facilities. **Analysis:** The project is not of sufficient scope to adversely impact schools or existing cultural facilities. **Finding:** Source documentation is in compliance.

Environmental Assessment Factor	Impact Code	Impact Evaluation
Commercial Facilities	2	**Threshold of Significance:** Adverse effect results due to lack of available commercial facilities to serve residents. **Analysis:** The documentation provided shows commercial facilities in downtown Pittsburg are adequate to serve additional residents. **Finding:** Source documentation is in compliance.
Health Care and Social Services	2	**Threshold of Significance:** Adverse effect results due to lack of available heath care or social service facilities to serve residents. **Analysis:** The documentation provided documents health care and social service facilities in Pittsburg are adequate to serve additional residents. **Finding:** Source documentation is in compliance.
Solid Waste Disposal / Recycling	3	**Threshold of Significance:** Project requires the construction of additional facilities or creates a cumulatively significant impact to the provision of services in the area. **Analysis:** The following is supplemental information to the EA and Re-evaluation. Solid waste collection, disposal, and recycling services are provided to the subject property by Mt. Diablo Resource Recovery (MDRR). MDRR operates the Mt. Diablo Recycling Center at 1300 Loveridge Road, Pittsburg, and offers curbside garbage, green waste, and recycling services to residents and businesses. **Existing Waste Disposal Facilities** Keller Canyon Landfill Keller Canyon Landfill disposes of industrial non-recyclable waste from Pittsburg. The Keller Canyon Landfill has a maximum permitted throughput of 3,500,000 tons per day, and a maximum permitted capacity of 75,018,280 cubic yards, with a remaining capacity of 63,408,410 cubic yards.

Environmental Assessment Factor	Impact Code	Impact Evaluation
		Keller Canyon Landfill is a Class II facility designed to accept mixed municipal, construction/demolition, agricultural, sludge (bio-solids), and other designated industrial solid waste. Although the total acreage of the site is 1,399 acres, the allotted disposal footprint is 244 acres, to allow for a boundary between the facility and surrounding developments. Estimated cease of operation date for this facility is 2030. Recycling Center & Transfer Station Located at 1300 Loveridge Road, the Mt. Diablo Resource Recovery Park accepts and recycles all types of material. The facility also accepts regular household waste, wood, green waste, and construction debris. The RCTS contains Mt. Diablo Recycling, the area's largest state-of-the-art recycling processing center, with a goal of keeping all recyclable items, including paper, metals, cardboard, yard waste, urban wood waste, construction materials, and used oil out of the landfill, so as much material as possible can be recycled and reused. The facility also includes the region's largest construction and demolition recycling operation, resulting in thousands of tons of material being kept out of the landfill. The facility serves residential and commercial collection services to the cities of Concord, Pittsburg, Oakley, Rio Vista, and unincorporated areas throughout Contra Costa and Solano Counties. Hazardous Waste Disposal Delta Household Hazardous Waste Collection Facility, located at 2550 Pittsburg-Antioch Highway, in Pittsburg, is open Thursdays, Fridays, and Saturdays from 9 a.m. – 4 p.m. The facility is available to the residents of the East Contra Costa County communities, including Antioch, Bay Point, Bethel Island, Brentwood, Byron, Discovery Bay, Knightsen, Oakley, and Pittsburg. Proof of residency is required to use this facility. Solid Waste Generation Rates and Volumes The California Department of Resources Recycling and Recovery (CalRecycle) tracks and monitors solid waste generation rates on a per capita basis. Per capita solid waste generation rates and total annual solid waste disposal volumes for the City between 2015 and 2017 are shown below.

Table 2 Solid Waste Generation Rates

Year	Waste Generation Rate (lbs/person/day)	Population	Total Disposal Tonnage (tons/year)
2015	5.20	67,628	63,923
2016	5.40	68,133	67,707
2017	5.50	71,342	72,064

Source: Cal Recycle. Accessed: May, 2019

As shown in the table above, the 2017 per capita disposal rate in Pittsburg, which is the most recently approved disposal rate, was 5.5 pounds per day (ppd) per resident.

The per capita waste generation rate increased from 5.2 to 5.5 lbs/person/day over the 3-year (2015-2017) period, and the total annual disposal tonnage in the city increased by 8,141 tons over the 2015-to-2017-time span. With the passage of SB 1016, per capita disposal rate is used to determine the diversion progress of a city and not the jurisdictional diversion rates. Therefore, a population increase resulting in the generation of more overall city waste does not affect the jurisdiction's ability to meet its waste goals. The City's waste disposal rate targets are shown below.

Table 3 City of Pittsburg Waste Disposal Rate Targets (Pounds per day)

Year	Population		Employment	
	Target	Actual	Target	Actual
2015	6.7	5.2	40.0	25.40
2016	6.7	5.4	40.0	26.50
2017	6.7	5.5	40.0	27.80

Source: Cal Recycle. Accessed: May, 2019

The City's target rate on the above table represents a 50% diversion rate. In accordance with AB 939, which required municipalities to aggressively pursue MSW source reduction and recycling, the City continues to meet and exceed all AB 939 goals. The various solid waste management actions adopted by the City include, but are not limited to, recycling and yard waste programs for residents and businesses, public education and public outreach awareness events, and school recycling and composting.

Environmental Assessment Factor	Impact Code	Impact Evaluation
		Finding: A population increase resulting in the generation of more overall city waste does not affect the jurisdiction's ability to meet its waste goals. No adverse impact identified. Source: City of Pittsburg. Existing Conditions Report. Chapter 3, Community Services and Facilities. November 2019.
Wastewater / Sanitary Sewers	2	**Threshold of Significance:** Project causes the need for new facilities and/or processing plants to be constructed. **Analysis:** The documentation provided documents are adequate facilities to accommodate the project. **Finding:** **Finding:** No adverse impacts identified. MM-12 and MM-13 are required, which specify fees for water and sewer service and appropriately sized sewer connections. Source documentation is in compliance.
Water Supply	3	**Threshold of Significance:** Not enough water to service the project. **Analysis:** The proposed Veterans Square project is consistent with the City's General Plan and zoning map and, as such, has been accounted for in the City's capacity analysis for water supply facilities. The Planning Commission staff report identified that the project can be served by existing utilities in place along East 9th and Los Medanos Streets. The City's approval of the project includes conditions that the project pay water and sewer facility reserve charges (MM-12); that the project provide appropriately sized connections to existing water service (MM-14); and conditions requiring the project to implement water efficiency measures (MM-15 and MM-16). The City of Pittsburg has reviewed and approved the project. Therefore, it has been determined that the project would be adequately served by public services, including water supply, with implementation of measures MM-12, MM-14, MM-15, and MM-16. **Finding:** There are no adverse impacts with implementation of measures MM-12, MM-14, MM-15, and MM-16. Source documentation is in compliance.

Environmental Assessment Factor	Impact Code	Impact Evaluation
Public Safety - Police, Fire and Emergency Medical	2	**Threshold of Significance:** Project causes the need to hire additional personnel or construct new facilities. **Analysis:** The City of Pittsburg has determined that there are no significant impacts to public safety services, and no mitigation is needed. **Finding:** No adverse impacts identified. MM-17 is required, which specify that the owner of the parcel is electing to annex the subject property into the Community Facilities District (CFD) 2005-1, fees which will be used for The fee will provide funding for an increase of police coverage in the area. Source documentation is in compliance.
Parks, Open Space and Recreation	2	**Threshold of Significance:** Inadequate facilities to serve the project residents. **Analysis:** Documentation provided demonstrates that there are adequate parks, open space, and recreational opportunities to serve residents. **Finding:** No adverse impacts identified. Source documentation is in compliance.
Transportation and Accessibility	3	**Threshold of Significance:** Significant and unavoidable project-level impacts to traffic and/or intersection level of service (LOS); dangerous curves caused by project design; inadequate public transportation to serve low-income residents. **Analysis:** The City of Pittsburg has reviewed and approved the project. The City's approval included conditions that the project pay the Local Transportation Mitigation Fee and the Pittsburg Regional Transportation Development Impact Fee to address demands on the local and regional roadway systems. These requirements are included in MM-12. Implementation of MM-12 will ensure that the project does not result in adverse impacts to transportation facilities. The project design does not create dangerous conditions, other than requiring residents to cross Los Medanos Avenue at the corner to access personal vehicles in the parking lot across the street. There are adequate public transit facilities available, including BART. BART is accessible from the site via bus service on East 10th Street.

Environmental Assessment Factor	Impact Code	Impact Evaluation
		Finding: Implementation of MM-12 will ensure that the project does not result in adverse impacts to transportation facilities. Source documentation is in compliance.
NATURAL FEATURES		
Unique Natural Features, Water Resources	2	**Threshold of Significance:** Project will adversely impact natural features, water resources, or other unique features on the site. **Analysis:** The project site is in-fill and contains no special status plants or animals; nor does it contain any water features. **Finding:** No adverse impacts identified. Source documentation is in compliance.
Vegetation, Wildlife	2	**Threshold of Significance:** Project will adversely affect vegetation and wildlife. **Analysis:** The project site is in-fill and contains no special status plants or animals; nor does it contain any water features. **Finding:** No adverse impacts identified. Documentation is in compliance.
Other Factors	1	**Threshold of Significance:** Project results in adverse effects in any other area. **Analysis:** The project will not result in adverse effects and will, in fact, provide much-needed affordable housing for Veterans, and is, therefore, a benefit to residents and the community. **Finding:** No adverse impacts identified. Documentation is in compliance. The project provides a benefit.

Attachments:

1. **Klein, Heather.** *Veterans Square Mitigation Measures.* s.l. : City of Oakland, August 2021.

2. ***Veterans Square - Screening for Exposure of Sensitive Receptors to Cancer, Hazard and PM 2.5 Risks.***

3. City of Pittsburg. *General Plan.* 2020. Figure 2-2, General Plan Diagram.

4. J.C. Brennan & Associates. *HUD Noise Assessment - East 9th & Los Medanos Apartments - City of Pittsburg, CA.* Auburn, CA : s.n., April 7, 2016.

5. U.S. Department of Housing and Urban Development. *DNL Calculator Tool, Veterans Square.* s.l. : AEM Consulting, August 11, 2021.

6. —. *DNL Calculator Tool, Veterans Square - Common Outdoor Space.* s.l. : AEM Consulting, August 11, 2021.

7. —. *Barrier Performance Module, East 10th Street.* s.l. : AEM Consulting, August 11, 2021.

8. —. *Barrier Performance Module, BNSF Railroad.* s.l. : AEM Consulting, August 11, 2021.

9. —. *DNL Calculator Tool - Veterans Square Parking Lot (30 spaces).* s.l. : AEM Consulting, August 20, 2021.

10. United States Environmental Protection Agency. *EJSCREEN Report, Veterans Square.* August 19, 2021.

11. Rockridge Geotechnical. *Geotechnical Investigation, Veterans Square, 901 Los Medanos Street, Pittsburg, California.* Oakland, CA : s.n., May 31, 2019. Project No. 19-1661.

Source Documentation

Veterans Square Environmental Assessment, dated May 2016

Re-evaluation Memorandum, dated June 2019

Attachments

Veterans Square Mitigation Measures:

MM – 1 Prior to the initiation of construction or ground disturbance activities on the project site, a training session regarding potential archaeological discoveries shall be conducted for the on- site construction crew. In the event that archaeological resources, including artifacts, exotic rock, or unusual amounts of stone, bone, or shell, are encountered during construction-related activities, construction shall be stopped within 50 feet of where the find was encountered.
Contra Costa County shall be notified and a qualified archaeologist shall evaluate the find. The archaeologist shall assess the extent and cultural value of the resource. If the resource is identified to be a significant cultural resource, including an archaeological resource or historic resource, the archaeologist shall recover and record the resources using standard professional archaeological methods. If human remains are discovered during construction- related activities, the Contra Costa County Coroner and Native American Heritage Commission shall be contacted and the human remains shall be addressed pursuant to the requirements of California Health and Safety Code Section 7050.5.

MM-2 The measures shall be adhered to during all site preparation and construction activities:

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
4. All vehicle speeds on unpaved roads shall be limited to 15 mph.
5. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
6. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator.
8. Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

MM-3 Mechanical ventilation shall be installed in all residential uses to allow residents to keep doors and windows closed, as desired for acoustical isolation from traffic and railroad noise.

MM-4 Prior to issuance of a building permit or grading permit, whichever is eligible to be issued first, the developer shall submit to the city's Engineering Division, for review and

comment, five (5) copies of the engineering plans, prepared by a registered civil engineer, to include but not be limited to the following: a. A site plan; b. A grading and drainage plan; c. A utilities plan; d. A landscaping and irrigation plan; e. A Stormwater Control Plan and Report; and f.
An Erosion and Sedimentation Control Plan. (City Condition 14)

MM-5 Prior to issuance of a grading permit, the developer shall submit to the Engineering Department two copies of the Stormwater Control Plan and Report. The report shall contain the sizing tool output to substantiate the design of the proposed treatment facilities. The plans shall include drawings and specifications necessary to implement all measures in the approved Stormwater Control Plan. A copy of a completed "Construction Plan C.3 Checklist", as described in the edition of the Stormwater C.3 Guidebook that is most current as of the date of submittal of the grading permit application shall be included. Grading and/or building plans shall be consistent with the Stormwater Control Plan approved by the Engineering Department. Grading and/or building permits shall not be issued until this condition is met to the satisfaction of the Engineering and Planning Departments. (City Condition 16)

MM-6 Grading and/or building permit plans (including structural, mechanical, architectural, grading, drainage, site, landscape, and other drawings) shall show the details and methods of construction for site design measures to limit directly connected impervious area, pervious pavements, self-retaining areas, treatment best management practices (BMPs), permanent stormwater control BMPs, and other features that control stormwater flow and potential for stormwater pollutants. (City Condition 17)

MM-7 Prior to final inspection approvals by the Engineering Department, the applicant shall submit a Stormwater BMP Operation and Maintenance Plan for review and approval by the Engineering, Planning, and Public Works Departments. Guidelines for the preparation of Stormwater BMP Operation and Maintenance Plans are in the most current edition of the Stormwater C.3 Guidebook. (City Condition 18)

MM-8 Prior to the issuance of the Certificate of Occupancy, the developer shall submit the final draft of the Stormwater BMP Operation and Maintenance Plan for review and approval by the Engineering Department. The developer shall also execute the Operations and Maintenance Agreement, which pertains to the transfer of ownership and / or long-term maintenance of stormwater treatment BMPs or hydrograph modification BMPs. The Guidelines for the preparation of Stormwater BMP Operation and Maintenance Plans are found on the Contra Costa County Clean Water Program website (www.cccleanwater.org) or the most current edition of the C.3 Guidebook. (City Condition 19)

MM-9 Prior to issuance of a Grading Permit, the developer shall submit the following to the Engineering Department for review: an Erosion and Sedimentation Control Plan or Stormwater Pollution Prevention Plan (SWPPP) if project requires an NPDES Construction Permit, and a copy of the Notice of Intent (NOI), which was submitted to the State Water Resources Control Board. The erosion control / SWPPP shall identify Best Management Practices (BMPs) appropriate to the uses conducted on-site to effectively prohibit the entry of pollutants into storm water runoff. The SWPPP measures shall also include erosion control measures to prevent soil, dirt, and debris from entering the storm drain system, in accordance with the regulations outlined in the

ABAG Erosion and Sediment Control Handbook. (NPDES requirements) (City Condition 22)

MM-10 The developer shall incorporate long-term BMPs for the reduction or elimination of storm water pollutants. The project design shall incorporate wherever feasible, the following long term BMPs to limit pollutant generation, discharge, and runoff. Such source control design measures may include:

a. Incorporating landscaping that minimizes irrigation and runoff, promotes surface infiltration where possible, minimizes the use of pesticides and fertilizers, and incorporates appropriate sustainable landscaping practices.
b. Use pavers for walkways and other appropriate hardscape surfaces to minimize impervious areas.
c. Minimizing the amount of directly connected impervious surface area.
d. Stencil all storm drains with "No Dumping, Drains to Delta" permanent markings.
e. Constructing concrete driveway weakened plane joins at angles to assist in directing run- off to landscaped/pervious areas prior to entering the street curb and gutter f. Plumbing of the following discharges to the sanitary sewer, subject to Delta Diablo Sanitation District's authority and standards: i) dumpster drips from covered trash and food compactor enclosures; ii) discharges from outdoor covered wash areas for vehicles, equipment, and accessories; iii) fire sprinkler test water, if discharge to onsite vegetated areas is not a feasible option. (City Condition 23)

MM-11 The developer shall submit to the Engineering Department, a current geotechnical report that substantiates the design features incorporated into this project including, but not limited to, grading activities, compaction requirements, utility construction, slopes, retaining walls, and roadway sections. The geotechnical report shall be submitted to the Engineering Department for review prior to the approval of any civil plans and issuance of any Engineering permits. (City Condition 15). The applicant shall implement the recommendations contained in the approved report during project design and construction.

MM-12 The developer shall pay the following fees to the Engineering Department, prior to issuance of a building permit:

a. Facility Reserve Charge: The developer shall pay the City of Pittsburg Facilities Reserve Charge (PMC Chapters 13.08, 13.12 and 13.24) (the "FRC") to the Engineering Department, for water and sewer service, in the amounts in effect when the developer obtains a Building Permit. The developer understands that the current FRC on file, effective August 20, 2005, shall be paid in accordance with the fee schedule approved by Resolution No. 05- 10290, as amended on February 21, 2012, by Resolution No. 12- 11778, a copy of which is available at the City. The FRC shall be paid to the Engineering Department prior to the issuance of a Building Permit.
b. Traffic Mitigation Fees: The developer shall pay the Local Transportation Mitigation Fee (PMC Chapter 15.90) (the "LTMF") amount in effect when the developer obtains a Building Permit. The developer understands that the LTMF currently on file is $4,557 per Medium Density dwelling unit. The developer further understands that the LTMF is reviewed and adjusted annually to the current Construction Cost Index (CCI) and may be increased at the City Council's discretion based on revised cost estimates for roadway and transit facilities and other factors that demonstrate an increase is needed to offset traffic impacts caused by new development. The LTMF

is calculated by dividing the total fee share of improvement costs by the total number of Dwelling Unit Equivalencies ("DUE") in the City, as described in PMC Chapter 15.90 and the Pittsburg Local Transportation Mitigation Fee Program Update, copies of which are available from the City. Fees shall be paid prior to issuance of a Building Permit.

c. The developer shall pay the Pittsburg Regional Transportation- Development Impact Mitigation Fee (PMC Chapter 15.103) (the "PRTDIM") amount in effect when the developer obtains a Building Permit. The developer understands that the PRTDIM currently on file is $9,934.45 per multi-family dwelling unit. The PRTDIM will be automatically increased or decreased on January 1 of each year based on the percent change in the Engineering News-Record Construction Costs Index – San Francisco Bay Area between September 1 and September 1 of the preceding two calendar years. Fees shall be paid prior to issuance of a Building Permit. If no Building Permit is required, then the fees are payable in the amount in effect when the project commences pursuant to PMC Section 15.103.040. (City Condition 13)

MM-13 The developer shall provide appropriate sanitary sewer, adequately sized to accommodate the project's wastewater demand. (City Condition 30)

MM-14 The developer shall provide appropriate water service, adequately sized to meet the domestic and fire protection demands for the project. (City Condition 29)

MM-15 Prior to issuance of a building permit for this project, the developer shall submit a final landscape plan for the property, which shall include all certifications and submittals required by the city's landscape ordinance (PMC chapter 18.84, article VII) and which shall be subject to review and approval by the city Planning and Engineering Departments. Drought-tolerant or moderate water use plants shall be incorporated into the landscape to the maximum extent practicable. (City Condition 8)

MM-16 Prior to occupancy of the apartment units by residents, the developer shall complete installation of landscaping and automatic irrigation systems in the front yard and corner side yards of the property and shall submit all certifications required by the city's landscape ordinance (PMC chapter 18.84, article VII). Following issuance of the certificate of occupancy, the developer or property manager shall be responsible for preventing water waste resulting from inefficient landscape irrigation by limiting landscape irrigation to the hours between 8:00 p.m. and 10:00 a.m.; and by prohibiting runoff from the target landscape areas due to excessive irrigation run times, low head drainage, overspray, or other similar conditions where water flows onto an adjacent property or the sidewalk. (City Condition 9)

MM-17 The developer shall deliver written approval in a manner acceptable to the City Finance Director, that the owner of the parcel is electing to annex the subject property into the Community Facilities District (CFD) 2005-1, prior to the issuance of any Engineering or Building Permits, whichever permit is eligible to be issued first. The fee will provide funding for an increase of police coverage in the area. The rate of the CFD fee is subject to the City Council Ordinance No. 05-1246. (City Condition 32)

MM-18 Prior to issuance of a building permit, the developer shall deliver written approval in a manner acceptable to the City Finance Director, that the owner of the parcel is electing to annex the subject property into the 2007- 01 Park Maintenance Community Facilities

District. (City Condition 33)

MM-19 Pre-construction Survey: If project activities must occur during the nesting season (February 1-August 31), a qualified biologist will conduct pre-construction surveys for active raptor and migratory bird nests within 30 days of the onset of these activities. For migratory birds and raptors, the survey area will include the Biological Study Area and a 250-foot buffer area surrounding the Biological Study Area. If active nests are found in the survey area, a sufficient buffer shall be provided to avoid disturbing breeding activities. A qualified biologist shall identify the appropriate buffer for the nesting species and construction activities shall not take place within the buffer. Active nests shall be monitored by a qualified biologist once per week until the young have fledged, at which time the buffer will be removed. If no active nests are found within the survey area, no further mitigation is required.

Veterans Square - Screening for Exposure of Sensitive Receptors to Cancer, Hazard, and PM2.5 Risks

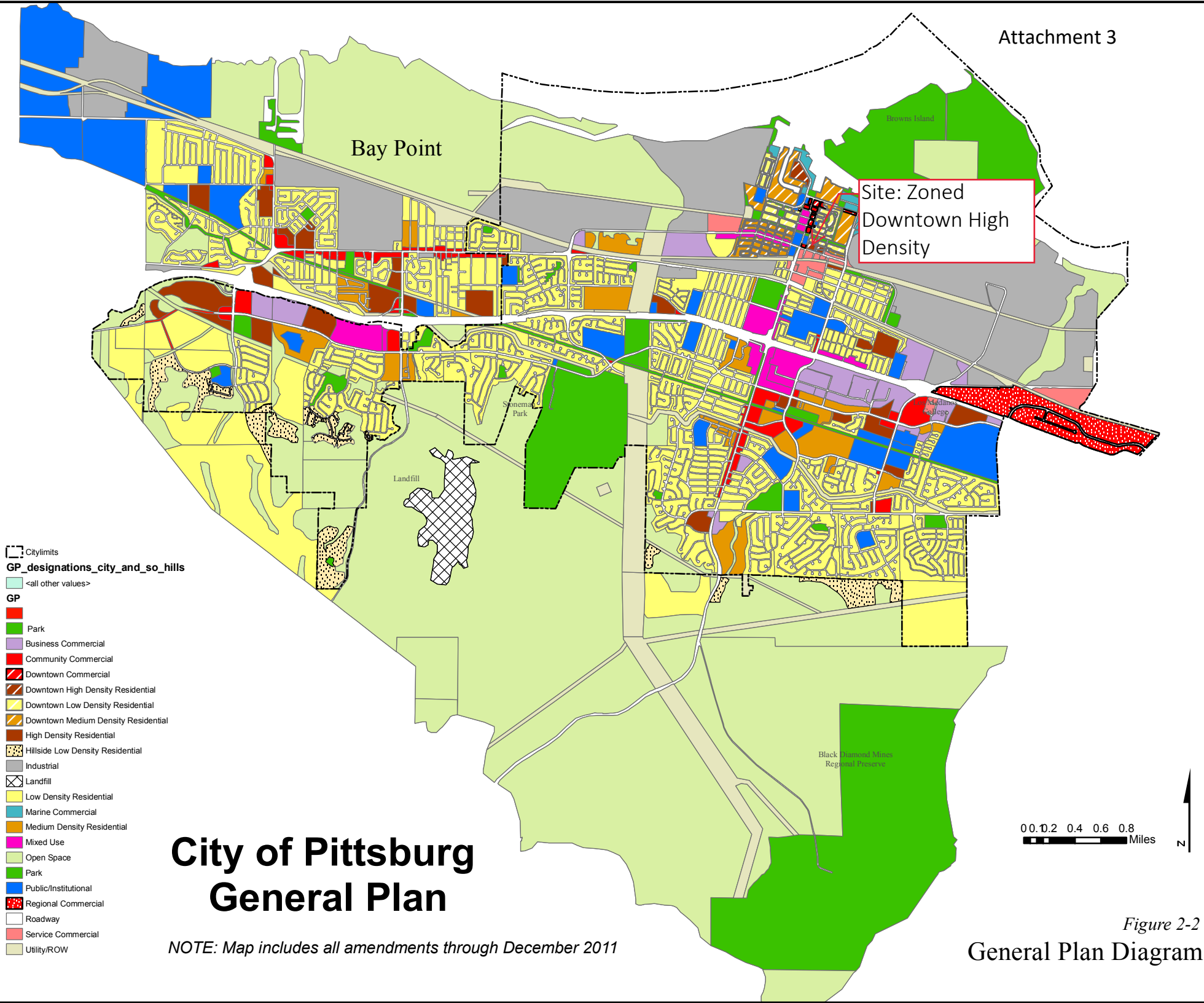
Site Identifier	Cancer	Hazard	PM2.5
G8534 (City of Pittsburg corps yard - used G11000 as proxy since no data for City yard)	1.3364	0.00191	NA
7306 - Jon Stanley Auto Body	0	0.003	0
12080- Russo Auto Body	0	0.001	0
19524 - West Coast Autobody/Paint	NA	NA	NA
19524 Proxy (used highest of 7306 John Stanley Auto Body, 17111 Collision Repair, 12950 Universal	0	0.003	0
G11000 - Redding Petroleum (adjusted for distance from site)	1.3364	0.00191	0
Railroad Ave (project 610 ft west of roadway, Railroad Ave has approx. 13,500 daily vehicle trips)	0.5	0	0.013
Cumulative Exposure	***3.1728***	***0.00982***	***0.013***
Individual Project Threshold [(a),(b),(c)]	*10*	*1*	*0.3*
Cumulative Impact Threshold [(d),(e),(f)]	***100***	***1***	***0.8***
Exceeds Cumulative Impact Threshold?	**No**	**No**	**No**

Note: Cumulative impact thresholds can be found on pg. 6 of the BAAQMD's *Recommended Methods for Screening and Modeling Local Risks*

BAAQMD individual risk thresholds (from the highest source within 1,000 foot radius of the receptor): [(a)]cancer risk of >10 in a million; [(b)]Cumulative chronic and acute hazard risk of >1.0; [(c)]Cumulative PM2.5 concentration of >0.8 micrograms/cubic meter

BAAQMD Cumulative risk thresholds (includes all major sources within 1,000 foot radius of the receptor): [(d)]Cumulative cancer risk of >10 in a

Attachment 3



City of Pittsburg General Plan

NOTE: Map includes all amendments through December 2011

Figure 2-2

General Plan Diagram

j.c. brennan & associates
consultants in acoustics
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April 7, 2016

Beth Thompson, Principal
De Novo Planning Group
4630 Brand Way
Sacramento, CA 95819
bthompson@denovoplanning.com

Subject: HUD Noise Assessment – East 9th & Los Medanos Apartments – City of Pittsburg, CA

Dear Ms. Thompson:

At your request, j.c. brennan & associates, Inc., has conducted a HUD noise analysis for the above-referenced project in the City of Pittsburg, California. The proposed project includes the construction of a 3-story 30-unit multi-family residential development at the southeast corner Los Medanos Street and E 9th Street.

The project site is located approximately 450 feet north of the BNSF railroad which is known to be a primary noise generator through the City of Pittsburg.

Figure 1 shows the project site plan.

EAST 9TH ST. & LOS MEDANOS ST.
PITTSBURG, CA

GROUND FLOOR PLAN **A2**
Date: 06.20.2011

EAST 9TH ST. & LOS MEDANOS ST.
PITTSBURG, CA

2ND FLOOR PLAN **A3**
Date: 06.20.2011

East 9th & Los Medanos Apartments
Figure 1: Project Site Plan

j.c. brennan & associates
consultants in acoustics

Rev. 4/6/16

Background Information on Noise and Vibration

Fundamentals of Acoustics

Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least 20 times per second), then they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second or Hertz (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals), as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels, but are expressed as dB, unless otherwise noted.

The decibel scale is logarithmic, not linear. In other words, two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70 dBA sound is half as loud as an 80 dBA sound, and twice as loud as a 60 dBA sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (L_{eq}), which corresponds to a steady-state A weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The L_{eq} is the foundation of the composite noise descriptor, L_{dn}, and shows very good correlation with community response to noise.

The day/night average level (L_{dn} or DNL) is based upon the average noise level over a 24-hour day, with a +10 decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, it tends to disguise short-term variations in the noise environment.

Table 1 lists several examples of the noise levels associated with common situations. Appendix A provides a summary of acoustical terms used in this report.

Table 1: Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft)	--100--	
Gas Lawn Mower at 1 m (3 ft)	--90--	
Diesel Truck at 15 m (50 ft), at 80 km/hr (50 mph)	--80--	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft)	--70--	Vacuum Cleaner at 3 m (10 ft)
Commercial Area Heavy Traffic at 90 m (300 ft)	--60--	Normal Speech at 1 m (3 ft)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing
Source: Caltrans, Technical Noise Supplement, Traffic Noise Analysis Protocol. November, 2009.		

HUD Criteria

The U.S. Department of Housing and Urban Development (HUD) establishes an acceptable exterior noise environment of 65 dBA L_{dn} (also expressed as "DNL" or Day/Night Level) at exterior areas of residential uses. Noise levels in the 65-75 dBA DNL range are considered Normally Unacceptable. However, 65-75 dBA DNL may be allowed, but require special approvals and additional sound attenuation measures. Such measures include a 5 dBA improvement to the building facade noise level reduction (NLR) for exterior noise levels in the 65-70 dBA range, and an improvement of 10 dBA for exterior noise levels in the 70-75 dBA range. The improvement is required in addition to "attenuation provided by buildings as commonly constructed in the area, and requiring open windows for ventilation."

Noise levels exceeding 75 dBA DNL are considered unacceptable and may only be allowed under special circumstances.

In addition, HUD established an interior noise level goal of 45 dBA DNL, while assuming a typical exterior-to-interior NLR of 20 dBA.

EVALUATION OF EXISTING AMBIENT NOISE LEVELS AT THE PROJECT SITE

To quantify existing ambient noise levels in the vicinity of the project site, j.c. brennan & associates, Inc. staff conducted a continuous 24-hour noise level measurement on the project site. See Figure 2 for the noise measurement location. The noise level measurements were conducted March 31st – April 1st, 2016. Table 2 shows a summary of the noise measurement results. Appendix B provides the complete results of the 24-hr hour noise measurements.

The sound level meter was programmed to record the maximum, median, and average noise levels during the survey. The maximum value, denoted L_{max}, represents the highest noise level measured. The average value, denoted L_{eq}, represents the energy average of all of the noise received by the sound level meter microphone during the monitoring period. The median value, denoted L_{50}, represents the sound level exceeded 50 percent of the time during the monitoring period.

A Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meter was used for the ambient noise level measurement survey. The meter was calibrated before and after use with an LDL Model CAL200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all pertinent specifications of the American National Standards Institute for Type 1 sound level meters (ANSI S1.4).

Table 2: Existing Ambient Noise Monitoring Results

Site	Location	Date - Time	Average Measured Hourly Noise Levels, dBA						
				Daytime (7:00 am - 10:00 pm)			Nighttime (10:00 pm – 7:00 am)		
			L_{dn}	L_{eq}	L_{50}	L_{max}	L_{eq}	L_{50}	L_{max}
Continuous 24-hour Noise Measurement Site									
LT-A	Southwest corner of project site. 490 feet to centerline of BNSF railroad	Thursday/Friday March 31st – April 1st 2016	60	58	55	77	52	49	67
Source: j.c. brennan & associates, Inc. – 2016									

East 9th & Los Medanos Apartments

Figure 2: Noise Monitoring Site

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Legend:

X : Noise Measurement Site

Rev. 4/6/16

PREDICTED NOISE LEVELS

Railroad Noise Levels

The BNSF railroad line is located approximately 450 feet south of the project site. Noise level measurements conducted for the City of Brentwood General Plan indicated that noise levels from this railroad line were measured to be 72 dB L_{dn} (DNL) at a distance of 100 feet from the railroad centerline.[1] This noise level was based upon approximately 18 trains per day in 2013. BNSF does not provide estimates of future daily operations. However, assuming a 1% per year in crease in operations, 2030 train operations would be approximately 22 per day. This yields a 1 dB increase for a future railroad noise level of 73 dB DNL at 100 feet.

Based upon this measurement, railroad noise levels at the project site would be approximately 63 dB DNL. Additionally, noise levels at upper floors are typically 2-3 dB louder than ground floor locations. Therefore, the proposed project is predicted to be exposed to exterior railroad noise levels in the range of 65-66 dB DNL at upper floors of the project.

Future Traffic Noise Levels

To predict noise levels due to traffic, the Federal Highway Administration Highway Traffic Noise Prediction Model (FHWA RD-77-108) was used. The model is based upon the Calveno reference noise emission factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA model was developed to predict hourly L_{eq} values for free-flowing traffic conditions.

The 2010 traffic volume for E. 10th Street is listed as 6,329 in the City's traffic counts. Assuming a 1% per year increase, the 2030 traffic volume would be 7,595.

Table 4 shows the predicted traffic noise levels at exterior and interior areas of the project. Appendix C shows the complete inputs and results of the traffic noise level predictions.

Table 4: Predicted Future (2030) Traffic Noise Levels

Noise Source	Location	Approximate Distance to Centerline, feet	Exterior Noise Level, L_{dn}
E. 10th Street	2nd / 3rd Floor Facades	140'	57 dB

Based upon the Table 1 data, exterior traffic noise levels at the upper floors of the project would be 57 dB DNL.

[1] City of Brentwood *General Plan Update: Existing Conditions Report.* Page 7-12. April 9, 2013. Online: http://brentwood.generalplan.org/sites/default/files/Brentwood_Existing_Conditions_Report_website.pdf

Combined Traffic and Railroad Noise Levels

Future (2030) railroad noise levels of up to 65-66 dB DNL are predicted at the upper floors of the project. Future (2030) traffic noise levels of up to 57 dB DNL are predicted at the upper floors of the project. These noise levels would combine for a total future (2030) noise exposure of 66-67 dB DNL. This exterior noise exposure would exceed the HUD exterior noise level standard of 65 dB L_{dn}.

Under the HUD criteria, an exterior noise exposure in the 65-70 dB L_{dn} range requires that an additional 5 dB of sound attenuation must be provided over the attenuation provided by standard construction (windows open). HUD assumes that standard construction provides an average of 20 dB of attenuation.[2] Therefore, a total exterior-to-interior noise level reduction of 25 dB would be required. This reduction can be achieved by ensuring that mechanical ventilation is provided so that occupants can keep windows closed for acoustical isolation.

CONCLUSIONS

The project interior noise levels are calculated to comply with the HUD noise level requirements, provided that the following recommendations are included in the project design:

- Mechanical ventilation shall be installed in all residential uses to allow residents to keep doors and windows closed, as desired for acoustical isolation from traffic and railroad noise.

If you have any questions, please contact me at LSaxelby@jcbrennanassoc.com.

Respectfully submitted,

j.c. brennan & associates, Inc.

Luke Saxelby, INCE Bd. Cert.
Vice President
Board Certified: Institute of Noise Control Engineering

[2] *The Noise Guidebook*, U.S. Department of Housing and Urban Development, Office of Community Planning and Development. Online: http://www.hud.gov/offices/cpd/environment/training/guidebooks/noise/index.cfm

Appendix A
Acoustical Terminology

Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
Attenuation	The reduction of an acoustic signal.
A-Weighting	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
Decibel or dB	Fundamental unit of sound, A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.
CNEL	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.
Frequency	The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz (Hz).
L_{dn}	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
L_{eq}	Equivalent or energy-averaged sound level.
L_{max}	The highest root-mean-square (RMS) sound level measured over a given period of time.
$L_{(n)}$	The sound level exceeded a described percentile over a measurement period. For instance, an hourly L_{50} is the sound level exceeded 50% of the time during the one hour period.
Loudness	A subjective term for the sensation of the magnitude of sound.
Noise	Unwanted sound.
NRC	Noise Reduction Coefficient. NRC is a single-number rating of the sound-absorption of a material equal to the arithmetic mean of the sound-absorption coefficients in the 250, 500, 1000, and 2,000 Hz octave frequency bands rounded to the nearest multiple of 0.05. It is a representation of the amount of sound energy absorbed upon striking a particular surface. An NRC of 0 indicates perfect reflection; an NRC of 1 indicates perfect absorption.
Peak Noise	The level corresponding to the highest (not RMS) sound pressure measured over a given period of time. This term is often confused with the AMaximum@ level, which is the highest RMS level.
RT_{60}	The time it takes reverberant sound to decay by 60 dB once the source has been removed.
Sabin	The unit of sound absorption. One square foot of material absorbing 100% of incident sound has an absorption of 1 Sabin.
SEL	Sound Exposure Level. SEL is s rating, in decibels, of a discrete event, such as an aircraft flyover or train passby, that compresses the total sound energy into a one-second event.
STC	Sound Transmission Class. STC is an integer rating of how well a building partition attenuates airborne sound. It is widely used to rate interior partitions, ceilings/floors, doors, windows and exterior wall configurations.
Threshold of Hearing	The lowest sound that can be perceived by the human auditory system, generally considered to be 0 dB for persons with perfect hearing.
Threshold of Pain	Approximately 120 dB above the threshold of hearing.
Impulsive	Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.
Simple Tone	Any sound which can be judged as audible as a single pitch or set of single pitches.

Appendix B
East 9th & Los Medanos Apartments
24hr Continuous Noise Monitoring - Site A
Thursday March 31 - Friday April 1, 2016

Hour	Leq	Lmax	L50	L90
10:00:00	56	79	53	49
11:00:00	55	77	53	51
12:00:00	55	76	53	50
13:00:00	56	72	54	51
14:00:00	57	78	56	54
15:00:00	58	82	55	52
16:00:00	57	73	56	53
17:00:00	57	72	56	54
18:00:00	57	72	56	54
19:00:00	59	83	56	55
20:00:00	58	83	56	54
21:00:00	56	72	55	53
22:00:00	53	73	52	48
23:00:00	54	73	51	48
0:00:00	49	64	48	45
1:00:00	47	59	46	44
2:00:00	50	64	49	46
3:00:00	53	70	48	46
4:00:00	50	63	49	47
5:00:00	51	64	49	48
6:00:00	53	72	51	49
7:00:00	56	73	53	51
8:00:00	61	79	58	53
9:00:00	61	82	55	52

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	61	55	58	54	47	52
Lmax (Maximum)	83	72	77	73	59	67
L50 (Median)	58	53	55	52	46	49
L90 (Background)	55	49	52	49	44	47

Computed Ldn, dB	60
% Daytime Energy	87%
% Nighttime Energy	13%

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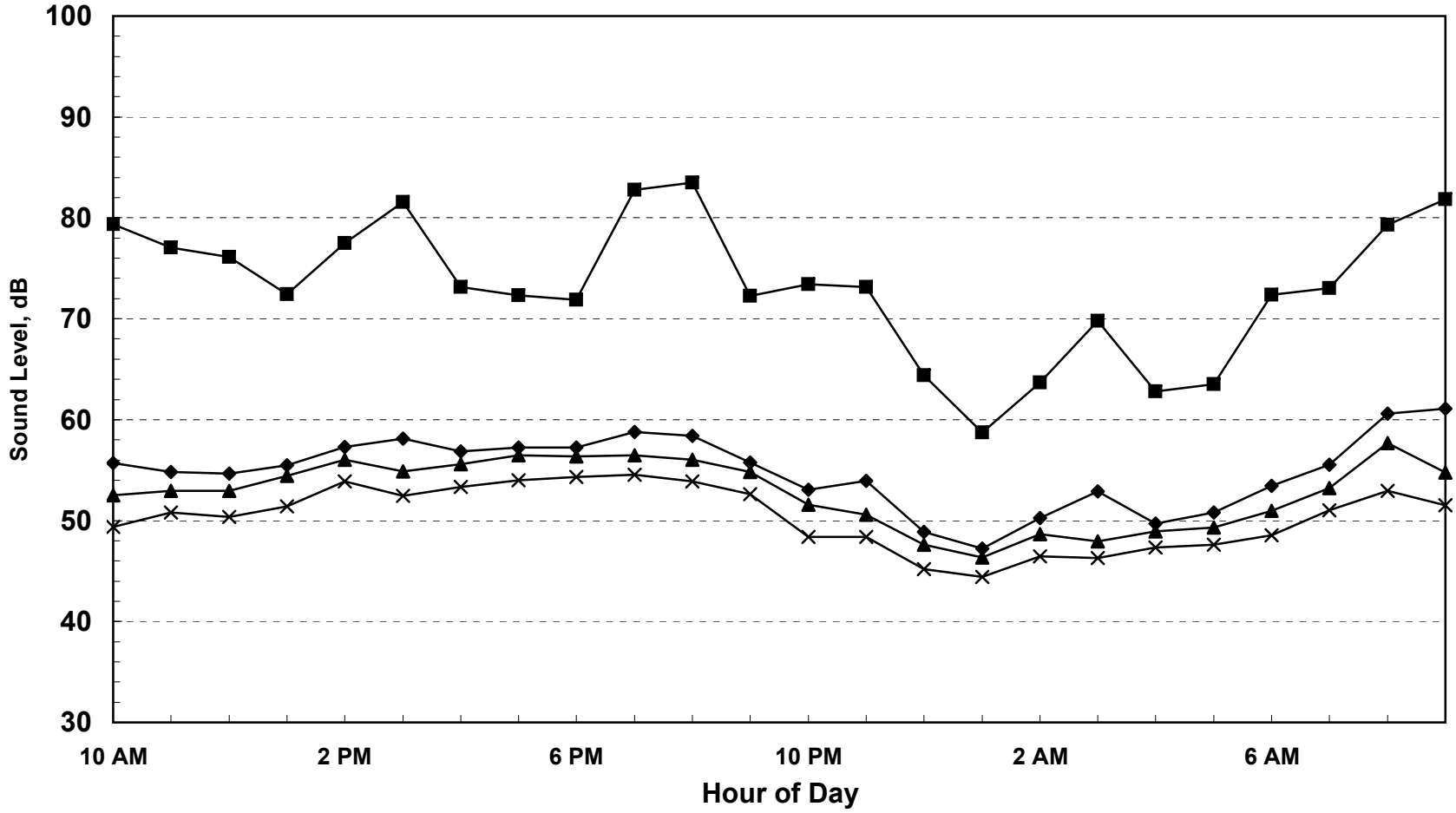
Appendix B

East 9th & Los Medanos Apartments

24hr Continuous Noise Monitoring - Site A

Thursday March 31 - Friday April 1, 2016



Ldn = 60 dB

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Appendix C

FHWA Traffic Noise Prediction Model (FHWA-RD-77-108)
Noise Prediction Worksheet

Project Information:

Job Number: 2016-131
Project Name: East 9th & Los Medanos Apartments
Roadway Name: E 10th Street

Traffic Data:

Year:	Future (2030)
Average Daily Traffic Volume:	7,595
Percent Daytime Traffic:	87
Percent Nighttime Traffic:	13
Percent Medium Trucks (2 axle):	1
Percent Heavy Trucks (3+ axle):	0.5
Assumed Vehicle Speed (mph):	30
Intervening Ground Type (hard/soft):	**Soft**

Traffic Noise Levels:

				----------L_{dn}, dB----------			
Location:	**Description**	**Distance**	**Offset (dB)**	**Autos**	**Medium Trucks**	**Heavy Trucks**	**Total**
1	2nd/3rd Floor Facades	140	3	56	46	50	57

Traffic Noise Contours (No Calibration Offset):

L_{dn} Contour, dB	Distance from Centerline, (ft)
75	6
70	12
65	27
60	58

Notes:

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DNL Calculator

The Day/Night Noise Level Calculator is an electronic assessment tool that calculates the Day/Night Noise Level (DNL) from roadway and railway traffic. For more information on using the DNL calculator, view the **Day/Night Noise Level Calculator Electronic Assessment Tool Overview (/programs/environmental-review/daynight-noise-level-electronic-assessment-tool/)**.

Guidelines

- To display the Road and/or Rail DNL calculator(s), click on the "Add Road Source" and/or "Add Rail Source" button(s) below.
- All Road and Rail input values must be positive non-decimal numbers.
- All Road and/or Rail DNL value(s) must be calculated separately before calculating the Site DNL.
- All checkboxes that apply must be checked for vehicles and trains in the tables' headers.
- **Note #1:** Tooltips, containing field specific information, have been added in this tool and may be accessed by hovering over all the respective data fields (site identification, roadway and railway assessment, DNL calculation results, roadway and railway input variables) with the mouse.
- **Note #2:** DNL Calculator assumes roadway data is always entered.

DNL Calculator

Site ID	Veterans Square
Record Date	08/11/2021
User's Name	Crake/AEM Consulting

Road # 1 Name:	**E 10th Street**

Road #1

Vehicle Type	Cars ☑	Medium Trucks ☑	Heavy Trucks ☑
Effective Distance	140	140	140
Distance to Stop Sign			
Average Speed	25	25	25
Average Daily Trips (ADT)	7367	114	114
Night Fraction of ADT	15	15	15
Road Gradient (%)			2
Vehicle DNL	53	45	58
Calculate Road #1 DNL	59	Reset	

Railroad #1 Track Identifier:	BNSF Rail

Rail # 1

Train Type	Electric ☐	Diesel ☑
Effective Distance		450
Average Train Speed		35
Engines per Train		2
Railway cars per Train		15
Average Train Operations (ATO)		22
Night Fraction of ATO		15
Railway whistles or horns?	Yes: ☐ No: ☐	Yes: ☑ No: ☐
Bolted Tracks?	Yes: ☐ No: ☐	Yes: ☑ No: ☐

Train DNL	0	67
Calculate Rail #1 DNL	67	Reset

Add Road Source | Add Rail Source

Airport Noise Level	
Loud Impulse Sounds?	○**Yes** ○**No**
Combined DNL for all Road and Rail sources	**67**
Combined DNL including Airport	**N/A**
Site DNL with Loud Impulse Sound	

Calculate | Reset

Mitigation Options

If your site DNL is in Excess of 65 decibels, your options are:

- **No Action Alternative**: Cancel the project at this location

- **Other Reasonable Alternatives**: Choose an alternate site
- **Mitigation**
    - **Contact your Field or Regional Environmental Officer (/programs/environmental-review/hud-environmental-staff-contacts/)**
    - Increase mitigation in the building walls (only effective if no outdoor, noise sensitive areas)
    - Reconfigure the site plan to increase the distance between the noise source and noise-sensitive uses
    - Incorporate natural or man-made barriers. See ***The Noise Guidebook (/resource/313/hud-noise-guidebook/)***
    - Construct noise barrier. See the **Barrier Performance Module (/programs/environmental-review/bpm-calculator/)**

Tools and Guidance

Day/Night Noise Level Assessment Tool User Guide (/resource/3822/day-night-noise-level-assessment-tool-user-guide/)

Day/Night Noise Level Assessment Tool Flowcharts (/resource/3823/day-night-noise-level-assessment-tool-flowcharts/)

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The Day/Night Noise Level Calculator is an electronic assessment tool that calculates the Day/Night Noise Level (DNL) from roadway and railway traffic. For more information on using the DNL calculator, view the **Day/Night Noise Level Calculator Electronic Assessment Tool Overview (/programs/environmental-review/daynight-noise-level-electronic-assessment-tool/)**.

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- All Road and Rail input values must be positive non-decimal numbers.
- All Road and/or Rail DNL value(s) must be calculated separately before calculating the Site DNL.
- All checkboxes that apply must be checked for vehicles and trains in the tables' headers.
- **Note #1:** Tooltips, containing field specific information, have been added in this tool and may be accessed by hovering over all the respective data fields (site identification, roadway and railway assessment, DNL calculation results, roadway and railway input variables) with the mouse.
- **Note #2:** DNL Calculator assumes roadway data is always entered.

DNL Calculator

Site ID	Veterans Square - Common Outdoor Space
Record Date	08/11/2021
User's Name	Crake/AEM Consulting

Road # 1 Name:	**E 10th Street**

Road #1

Vehicle Type	Cars ☑	Medium Trucks ☑	Heavy Trucks ☑
Effective Distance	200	200	200
Distance to Stop Sign			
Average Speed	25	25	25
Average Daily Trips (ADT)	7367	114	114
Night Fraction of ADT	15	15	15
Road Gradient (%)			2
Vehicle DNL	51	42	56
Calculate Road #1 DNL	57	Reset	

Railroad #1 Track Identifier: **BNSF Rail**

Rail # 1

Train Type	Electric ☐	Diesel ☑
Effective Distance		500
Average Train Speed		35
Engines per Train		2
Railway cars per Train		15
Average Train Operations (ATO)		22
Night Fraction of ATO		15
Railway whistles or horns?	Yes: ☐ No: ☐	Yes: ☑ No: ☐
Bolted Tracks?	Yes: ☐ No: ☐	Yes: ☑ No: ☐

Train DNL	0	66
Calculate Rail #1 DNL	66	Reset

Add Road Source | Add Rail Source

Airport Noise Level	
Loud Impulse Sounds?	○**Yes** ○**No**
Combined DNL for all Road and Rail sources	**67**
Combined DNL including Airport	**N/A**
Site DNL with Loud Impulse Sound	

Calculate | Reset

Mitigation Options

If your site DNL is in Excess of 65 decibels, your options are:

- **No Action Alternative**: Cancel the project at this location

- **Other Reasonable Alternatives**: Choose an alternate site
- **Mitigation**
    - **Contact your Field or Regional Environmental Officer (/programs/environmental-review/hud-environmental-staff-contacts/)**
    - Increase mitigation in the building walls (only effective if no outdoor, noise sensitive areas)
    - Reconfigure the site plan to increase the distance between the noise source and noise-sensitive uses
    - Incorporate natural or man-made barriers. See ***The Noise Guidebook (/resource/313/hud-noise-guidebook/)***
    - Construct noise barrier. See the **Barrier Performance Module (/programs/environmental-review/bpm-calculator/)**

Tools and Guidance

Day/Night Noise Level Assessment Tool User Guide (/resource/3822/day-night-noise-level-assessment-tool-user-guide/)

Day/Night Noise Level Assessment Tool Flowcharts (/resource/3823/day-night-noise-level-assessment-tool-flowcharts/)

Barrier Performance Module

This module provides to the user a measure on the barrier's effectiveness on noise reduction. A list of the input/output variables and their definitions, as well as illustrations of different scenarios are provided.

Calculator

View Day/Night Noise Level Calculator (/programs/environmental-review/dnl-calculator/)

View Descriptions of the Input/Output variables.

Note: Tool tips, containing field specific information, have been added in this tool and may be accessed by hovering over the Input and Output variables with the mouse.

WARNING: If there is direct line-of-sight between the Source and the Observer, the module will report erroneous attenuation. "Direct line-of-sight" means if the 5' tall Observer can see the noise Source (cars, trucks, trains, etc.) over the Barrier (wall, hill/excavation, building, etc.), the current version of Barrier Performance Module will not accurately calculate the attenuation provided. In this instance, there is unlikely to be any appreciable attenuation.

Note: Barrier height must block the line of sight

Input Data

H	30	**R^1**	200
S	5	**D^1**	30
O	6	**α**	45

Calculate Output

Output Data

h	24	**R**	200
D	30	**FS**	1.2796

Reduction From Barrier (dB):

-1.2796

Refresh

Note: If you have separate Road and Rail DNL values, please enter the values below to calculate the new combined Road/Rail DNL :

Road DNL:

57

Rail DNL:

65

Calculate

Combined Road/Rail DNL with Barrier Reduction:

64.32039999999999

Input/Output Variables

Input Variables

The following variables and definitions from the barrier being assessed are the input required for the web-based barrier performance module:

- H = Barrier Height
- S = Noise Source Height
- O = Observer Height (known as the receiver)
- R^1 = Distance from Noise Source to Barrier
- D^1 = Distance from the Observer to the Barrier
- α = Line of sight angle between the Observer and the Noise Source, subtended by the barrier at observer's location

Output Variables

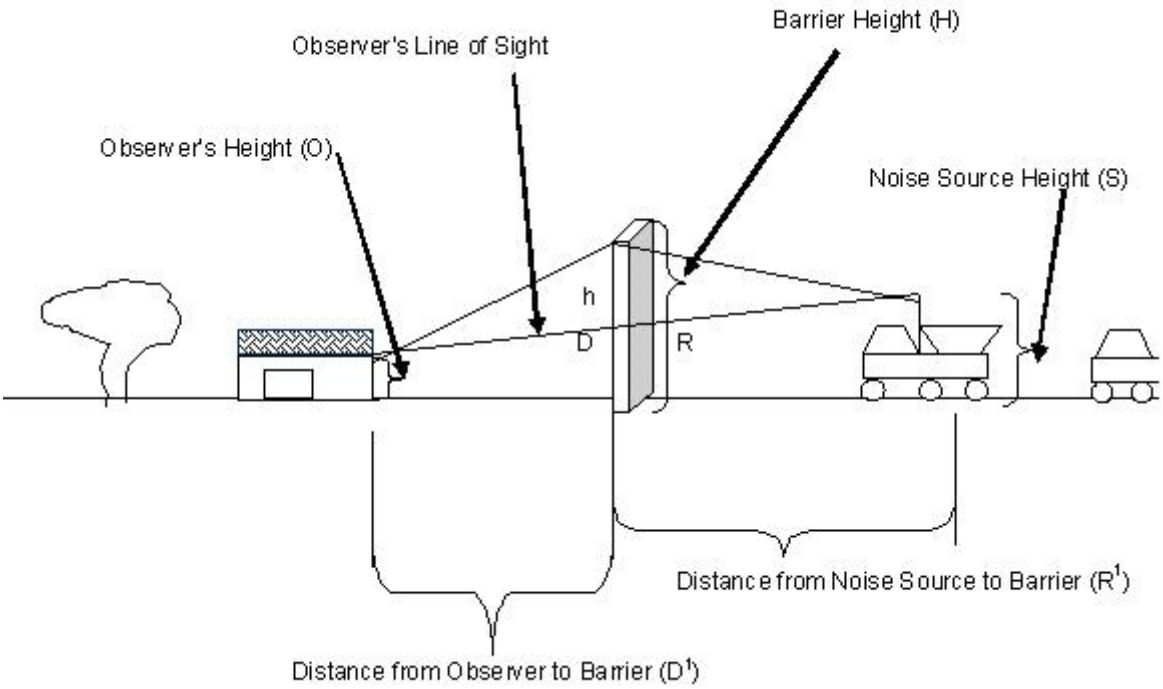
Definitions of the output variables from the mitigation module of the Day/Night Noise Level Assessment Tools as part of the Assessment Tools for Environmental Compliance:

- h = The shortest distance from the barrier top to the line of sight from the Noise source to

the Observer.

- R = Slant distance along the line of sight from the Barrier to the Noise Source
- D = Slant distance along the line of sight from the Barrier to the Observer

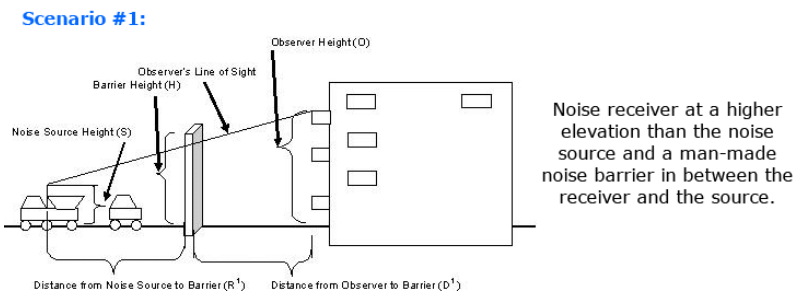
The “actual barrier performance for barriers of finite length” is noted on the worksheets(in the Guidebook) as **FS**.



Barrier Implementation Scenarios

Locate the cursor on the following thumbnails to enlarge the respective scenario as implementation examples of the barrier performance module.

Scenario #1:



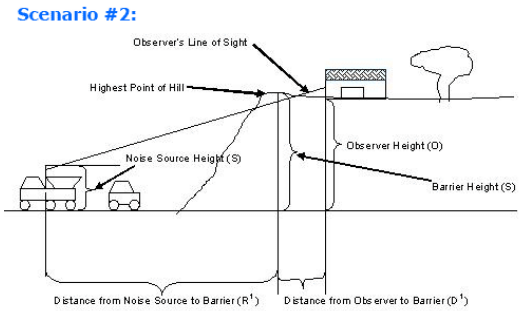
Noise receiver at a higher elevation than the noise source and a man-made noise barrier in between the receiver and the source.

(https://www.hudexchange.info/resources/documents/Barrier-Performance-Module-Barrier-Implementation-Scenario-1.gif)

view larger version of image (/resource/3841/barrier-performance-module-bpm-barrier-

implementation-scenarios/)

Scenario #2:



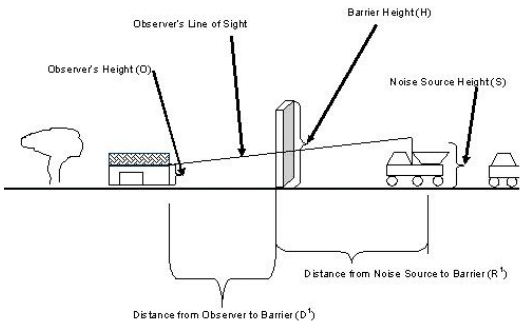
Noise receiver at a higher elevation than the noise source and a natural barrier (hill) between the receiver and the source.

Noise receiver at a higher elevation than the noise source and a natural barrier (hill) between the receiver and the source.

(https://www.hudexchange.info/resources/documents/Barrier-Performance-Module-Barrier-Implementation-Scenario-2.gif)

view larger version of image (/resource/3841/barrier-performance-module-bpm-barrier-implementation-scenarios/)

Scenario #3:



Noise receiver at almost the same elevation of the noise source and a man-made noise barrier between the receiver and the source.

Noise receiver at almost the same elevation of the noise source and a man-made noise barrier between the receiver and the source.

(https://www.hudexchange.info/resources/documents/Barrier-Performance-Module-Barrier-Implementation-Scenario-3.gif)

view larger version of image (/resource/3841/barrier-performance-module-bpm-barrier-implementation-scenarios/)

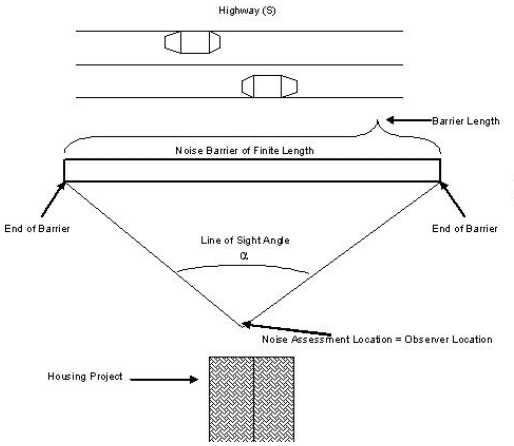
Scenario #4:

A noise barrier of finite length between a noise source and a receiver. This top view illustrates the angle α,

subtended by the barrier at the

Scenario #4:

observer’s location.



A noise barrier of finite length between a noise source and a receiver. This top view illustrates the angle a, subtended by the barrier at the observer’s location.

(https://www.hudexchange.info/resources/documents/Barrier-Performance-Module-Barrier-Implementation-Scenario-4.gif)

view larger version of image (/resource/3841/barrier-performance-module-bpm-barrier-implementation-scenarios/)

Contents

Barrier Performance Module

This module provides to the user a measure on the barrier's effectiveness on noise reduction. A list of the input/output variables and their definitions, as well as illustrations of different scenarios are provided.

Calculator

View Day/Night Noise Level Calculator (/programs/environmental-review/dnl-calculator/)

View Descriptions of the Input/Output variables.

Note: Tool tips, containing field specific information, have been added in this tool and may be accessed by hovering over the Input and Output variables with the mouse.

WARNING: If there is direct line-of-sight between the Source and the Observer, the module will report erroneous attenuation. "Direct line-of-sight" means if the 5' tall Observer can see the noise Source (cars, trucks, trains, etc.) over the Barrier (wall, hill/excavation, building, etc.), the current version of Barrier Performance Module will not accurately calculate the attenuation provided. In this instance, there is unlikely to be any appreciable attenuation.

Note: Barrier height must block the line of sight

Input Data

H	10	**R^1**	430
S	6	**D^1**	30
O	6	**α**	45

Calculate Output

Output Data

h	4	**R**	430
D	30	**FS**	1.2887

Reduction From Barrier (dB):

-1.2887

Refresh

Note: If you have separate Road and Rail DNL values, please enter the values below to calculate the new combined Road/Rail DNL :

Road DNL:

57

Rail DNL:

65

Calculate

Combined Road/Rail DNL with Barrier Reduction:

64.31129999999999

Input/Output Variables

Input Variables

The following variables and definitions from the barrier being assessed are the input required for the web-based barrier performance module:

- H = Barrier Height
- S = Noise Source Height
- O = Observer Height (known as the receiver)
- R^1 = Distance from Noise Source to Barrier
- D^1 = Distance from the Observer to the Barrier
- α = Line of sight angle between the Observer and the Noise Source, subtended by the barrier at observer's location

Output Variables

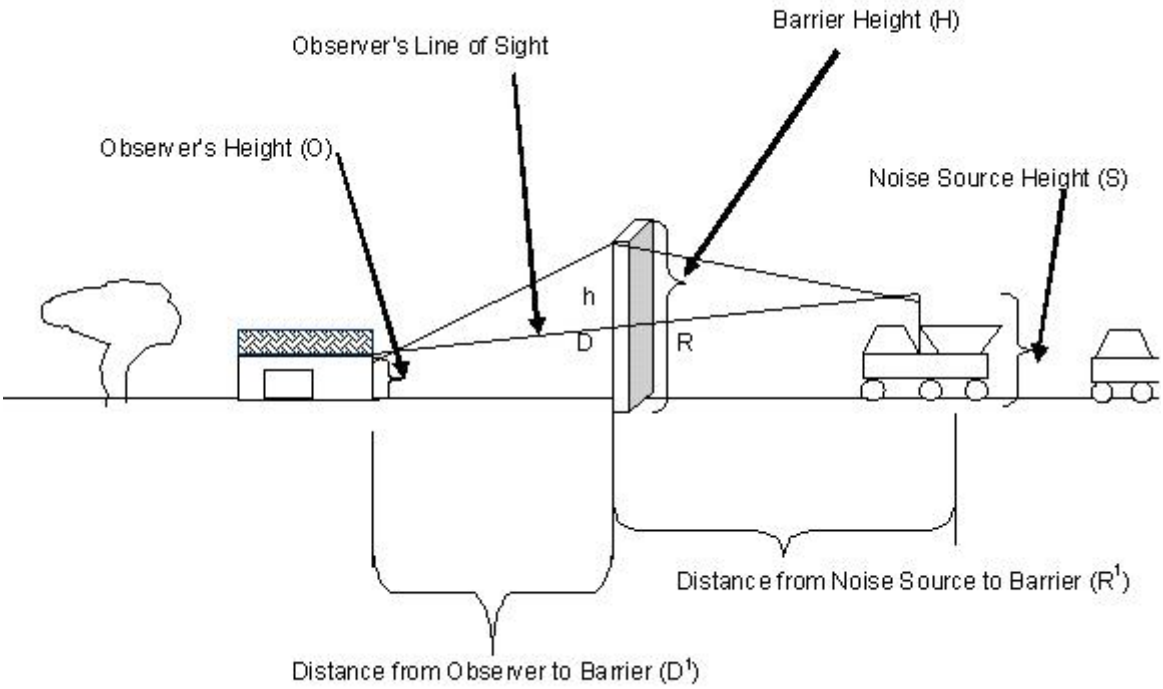
Definitions of the output variables from the mitigation module of the Day/Night Noise Level Assessment Tools as part of the Assessment Tools for Environmental Compliance:

- h = The shortest distance from the barrier top to the line of sight from the Noise source to

the Observer.

- R = Slant distance along the line of sight from the Barrier to the Noise Source
- D = Slant distance along the line of sight from the Barrier to the Observer

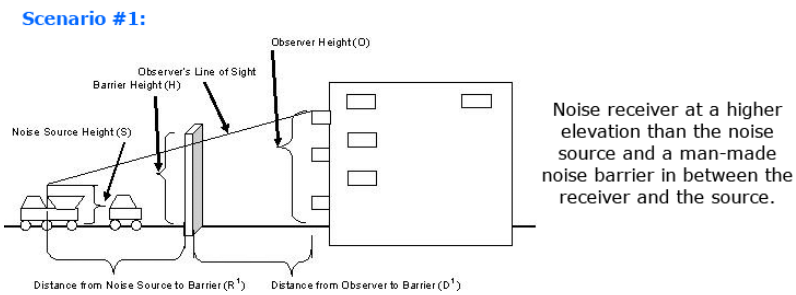
The “actual barrier performance for barriers of finite length” is noted on the worksheets(in the Guidebook) as **FS**.



Barrier Implementation Scenarios

Locate the cursor on the following thumbnails to enlarge the respective scenario as implementation examples of the barrier performance module.

Scenario #1:



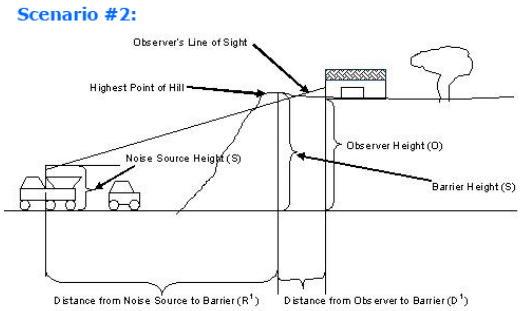
Noise receiver at a higher elevation than the noise source and a man-made noise barrier in between the receiver and the source.

(https://www.hudexchange.info/resources/documents/Barrier-Performance-Module-Barrier-Implementation-Scenario-1.gif)

view larger version of image (/resource/3841/barrier-performance-module-bpm-barrier-

implementation-scenarios/)

Scenario #2:



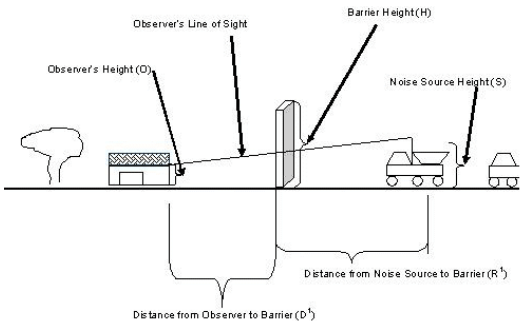
Noise receiver at a higher elevation than the noise source and a natural barrier (hill) between the receiver and the source.

Noise receiver at a higher elevation than the noise source and a natural barrier (hill) between the receiver and the source.

(https://www.hudexchange.info/resources/documents/Barrier-Performance-Module-Barrier-Implementation-Scenario-2.gif)

view larger version of image (/resource/3841/barrier-performance-module-bpm-barrier-implementation-scenarios/)

Scenario #3:



Noise receiver at almost the same elevation of the noise source and a man-made noise barrier between the receiver and the source.

Noise receiver at almost the same elevation of the noise source and a man-made noise barrier between the receiver and the source.

(https://www.hudexchange.info/resources/documents/Barrier-Performance-Module-Barrier-Implementation-Scenario-3.gif)

view larger version of image (/resource/3841/barrier-performance-module-bpm-barrier-implementation-scenarios/)

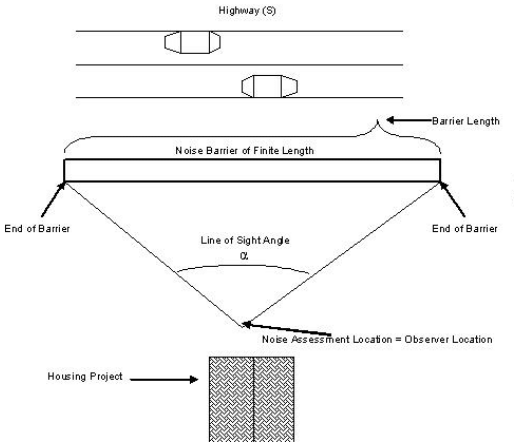
Scenario #4:

A noise barrier of finite length between a noise source and a receiver. This top view illustrates the angle α,

subtended by the barrier at the

Scenario #4:

observer’s location.



A noise barrier of finite length between a noise source and a receiver. This top view illustrates the angle a, subtended by the barrier at the observer’s location.

(https://www.hudexchange.info/resources/documents/Barrier-Performance-Module-Barrier-Implementation-Scenario-4.gif)

view larger version of image (/resource/3841/barrier-performance-module-bpm-barrier-implementation-scenarios/)

Contents

DNL Calculator

The Day/Night Noise Level Calculator is an electronic assessment tool that calculates the Day/Night Noise Level (DNL) from roadway and railway traffic. For more information on using the DNL calculator, view the **Day/Night Noise Level Calculator Electronic Assessment Tool Overview (/programs/environmental-review/daynight-noise-level-electronic-assessment-tool/)**.

Guidelines

- To display the Road and/or Rail DNL calculator(s), click on the "Add Road Source" and/or "Add Rail Source" button(s) below.
- All Road and Rail input values must be positive non-decimal numbers.
- All Road and/or Rail DNL value(s) must be calculated separately before calculating the Site DNL.
- All checkboxes that apply must be checked for vehicles and trains in the tables' headers.
- **Note #1:** Tooltips, containing field specific information, have been added in this tool and may be accessed by hovering over all the respective data fields (site identification, roadway and railway assessment, DNL calculation results, roadway and railway input variables) with the mouse.
- **Note #2:** DNL Calculator assumes roadway data is always entered.

DNL Calculator

Site ID	Veterans Square - Parking Lot
Record Date	08/20/2021
User's Name	Crake/AEM Consulting

Road # 1 Name:	**Los Medanos**

Road #1

Vehicle Type	Cars ☑	Medium Trucks ☐	Heavy Trucks ☐
Effective Distance	200		
Distance to Stop Sign			
Average Speed	35		
Average Daily Trips (ADT)	122		
Night Fraction of ADT	15		
Road Gradient (%)			
Vehicle DNL	36	0	0

Calculate Road #1 DNL | 36 | Reset

Add Road Source | Add Rail Source

Airport Noise Level	60
Loud Impulse Sounds?	○Yes ○No
Combined DNL for all Road and Rail sources	**36**
Combined DNL including Airport	**60**
Site DNL with Loud Impulse Sound	

Calculate | Reset

Mitigation Options

If your site DNL is in Excess of 65 decibels, your options are:

- **No Action Alternative**: Cancel the project at this location
- **Other Reasonable Alternatives**: Choose an alternate site
- **Mitigation**
    - **Contact your Field or Regional Environmental Officer (/programs/environmental-review/hud-environmental-staff-contacts/)**
    - Increase mitigation in the building walls (only effective if no outdoor, noise sensitive areas)
    - Reconfigure the site plan to increase the distance between the noise source and noise-sensitive uses
    - Incorporate natural or man-made barriers. See ***The Noise Guidebook (/resource/313/hud-noise-guidebook/)***
    - Construct noise barrier. See the **Barrier Performance Module (/programs/environmental-review/bpm-calculator/)**

Tools and Guidance

Day/Night Noise Level Assessment Tool User Guide (/resource/3822/day-night-noise-level-assessment-tool-user-guide/)

Day/Night Noise Level Assessment Tool Flowcharts (/resource/3823/day-night-noise-level-assessment-tool-flowcharts/)

EJSCREEN Report (Version 2020)

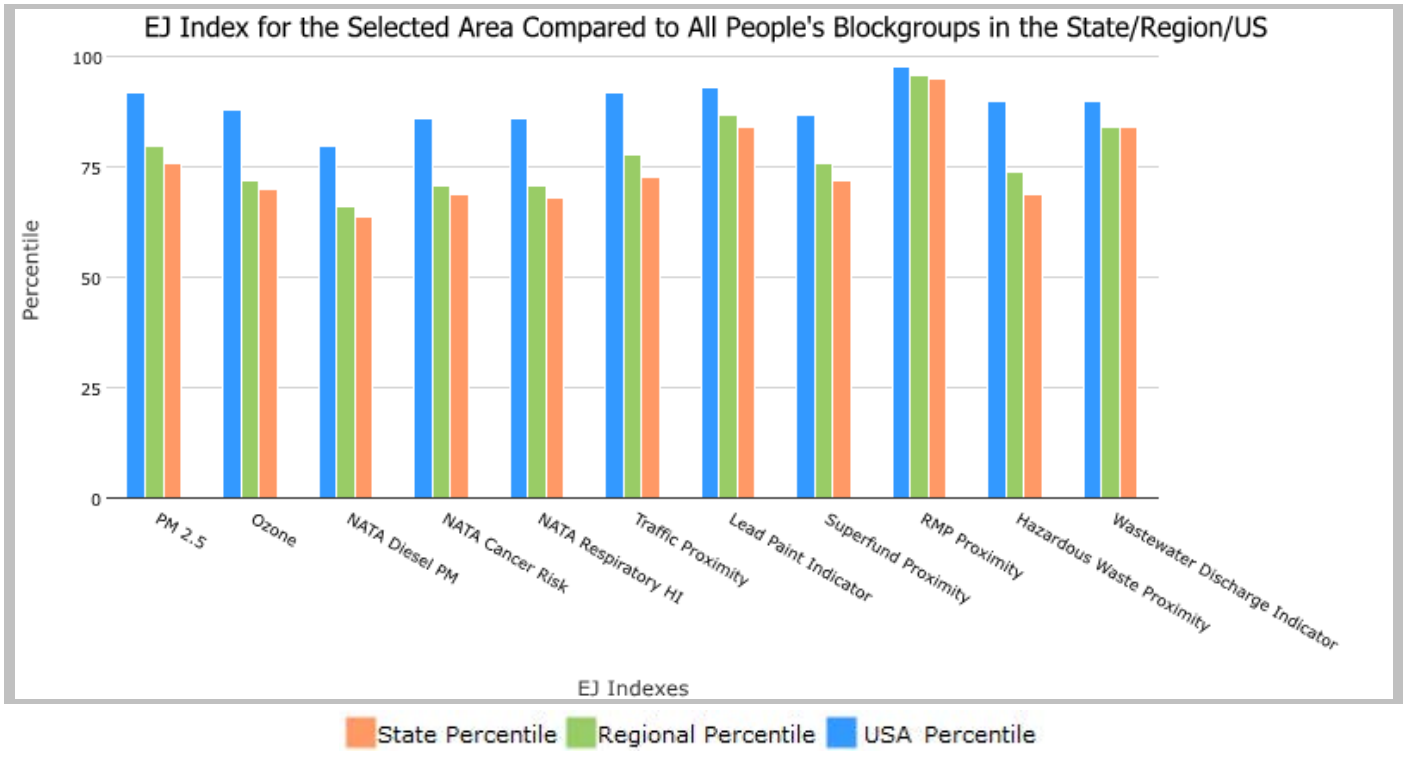
1 mile Ring Centered at 38.027947,-121.882541, CALIFORNIA, EPA Region 9

Approximate Population: 14,417

Input Area (sq. miles): 3.14

Veterans Square

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5	76	80	92
EJ Index for Ozone	70	72	88
EJ Index for NATA* Diesel PM	64	66	80
EJ Index for NATA* Air Toxics Cancer Risk	69	71	86
EJ Index for NATA* Respiratory Hazard Index	68	71	86
EJ Index for Traffic Proximity and Volume	73	78	92
EJ Index for Lead Paint Indicator	84	87	93
EJ Index for Superfund Proximity	72	76	87
EJ Index for RMP Proximity	95	96	98
EJ Index for Hazardous Waste Proximity	69	74	90
EJ Index for Wastewater Discharge Indicator	84	84	90



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

EJSCREEN Report (Version 2020)

1 mile Ring Centered at 38.027947,-121.882541, CALIFORNIA, EPA Region 9

Approximate Population: 14,417

Input Area (sq. miles): 3.14

Veterans Square

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	3

EJSCREEN Report (Version 2020)

1 mile Ring Centered at 38.027947,-121.882541, CALIFORNIA, EPA Region 9

Approximate Population: 14,417

Input Area (sq. miles): 3.14

Veterans Square

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in µg/m^3)	11.4	10.6	62	9.99	70	8.55	95
Ozone (ppb)	41.1	49.2	22	50.1	18	42.9	37
NATA* Diesel PM (µg/m^3)	0.287	0.467	28	0.479	<50th	0.478	<50th
NATA* Cancer Risk (lifetime risk per million)	29	36	21	35	<50th	32	<50th
NATA* Respiratory Hazard Index	0.43	0.55	19	0.53	<50th	0.44	50-60th
Traffic Proximity and Volume (daily traffic count/distance to road)	1200	2000	55	1700	62	750	84
Lead Paint Indicator (% Pre-1960 Housing)	0.46	0.29	71	0.24	76	0.28	74
Superfund Proximity (site count/km distance)	0.097	0.17	55	0.15	62	0.13	65
RMP Proximity (facility count/km distance)	5.6	1.1	97	0.99	97	0.74	99
Hazardous Waste Proximity (facility count/km distance)	3.9	6.2	44	5.3	53	5	80
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)	0.0059	18	77	18	76	9.4	76
Demographic Indicators							
Demographic Index	64%	47%	74	46%	76	36%	85
People of Color Population	85%	62%	72	60%	75	39%	87
Low Income Population	43%	33%	69	33%	69	33%	71
Linguistically Isolated Population	10%	9%	63	8%	68	4%	84
Population With Less Than High School Education	23%	17%	68	16%	70	13%	83
Population Under 5 years of age	10%	6%	83	6%	83	6%	84
Population over 64 years of age	11%	14%	46	14%	46	15%	36

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: https://www.epa.gov/national-air-toxics-assessment.

For additional information, see: www.epa.gov/environmentaljustice

ROCKRIDGE GEOTECHNICAL

Prepared for **Satellite Affordable Housing Associates**

GEOTECHNICAL INVESTIGATION
VETERAN'S SQUARE
901 LOS MEDANOS STREET
PITTSBURG, CALIFORNIA

May 31, 2019
Project No. 19-1661

270 Grand Avenue
Oakland, CA 94610

www.rockridgegeo.com

510 420-5738 tel
510 652-3096 fax

ROCKRIDGE GEOTECHNICAL

May 31, 2019
Project No. 19-1661

Ms. Evelyn Perdomo
Satellite Affordable Housing Associates
1835 Alcatraz Avenue
Berkeley, California 94703

Subject: Geotechnical Investigation Report
Veteran's Square
901 Los Medanos Street
Pittsburg, California

Dear Ms. Perdomo,

We are pleased to present our geotechnical investigation report for the proposed Veteran's Square affordable housing building and surface parking lot at Los Medanos and East 10th streets in Pittsburg, California. Our geotechnical investigation was performed in accordance with our proposal dated March 13, 2019.

The site is comprised of two lots located at 901 Los Medanos Street and at 295 East 10th Street. The lot at 901 Los Medanos Street is L-shaped with maximum plan dimensions of about 140 by 145 feet. The lot at 295 East 10th Street is rectangular shaped with plan dimensions of about 100 by 115 feet. Plans are to construct a three-story, wood-framed residential building containing 30 affordable housing units at 901 Los Medanos Street as well as an at-grade asphalt-paved parking lot at 295 East 10th Street.

From a geotechnical standpoint, we conclude the site can be developed as planned, provided the recommendations presented in this report are incorporated into the project plans and specifications and implemented during construction. The primary geotechnical concerns for the site are: 1) the presences of moderate to highly expansive near-surface clay, and 2) providing adequate foundation support for the proposed building. We conclude the proposed building may be supported on individual spread footings at interior column locations and continuous, deepened perimeter footings bearing on firm native alluvium. The perimeter footings should be deepened to act as barriers to reduce the potential for moisture change beneath the slab-on-grade floor.

The recommendations contained in our report are based on a limited subsurface exploration. Consequently, variations between expected and actual subsurface conditions may be found in localized areas during construction. Therefore, we should be engaged to observe grading, fill placement, and building pad and footing subgrade preparation, during which time we may make changes in our recommendations, if deemed necessary.

We appreciate the opportunity to provide our services to you on this project. If you have any questions, please call.

Sincerely yours,
ROCKRIDGE GEOTECHNICAL, INC.

Katie S. Dickinson
Project Engineer

Linda H.J. Liang, P.E., G.E.
Associate Engineer

Craig S. Shields, P.E., G.E.
Quality Control Reviewer

Enclosure

ROCKRIDGE GEOTECHNICAL

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ROCKRIDGE GEOTECHNICAL

GEOTECHNICAL INVESTIGATION
VETERAN'S SQUARE
901 LOS MEDANOS STREET
Pittsburg, California

1.0 INTRODUCTION

This report presents the results of the geotechnical investigation performed by Rockridge Geotechnical, Inc. for the proposed Veteran's Square affordable housing building and surface parking lot at Los Medanos and East 10th streets in Pittsburg, California. The site is comprised of two lots located at 901 Los Medanos Street and at 295 East 10th Street, as shown on the Site Location Map and Site Plan, Figures 1 and 2, respectively.

The lot at 901 Los Medanos Street is L-shaped with maximum plan dimensions of about 140 by 145 feet. It is currently a vacant lot bordered to the north by East 9th Street, to the east by single-family homes, to the south by commercial buildings, and to the west by Los Medanos Street. The lot at 295 East 10th Street is rectangular shaped with plan dimensions of about 100 by 115 feet. It is currently a vacant lot bordered to the north by a landscaped area at the rear of a neighboring church, to the east by Los Medanos Street, to the south by East 10th Street, and to the west by a vacant lot.

Plans are to construct a three-story, wood-framed residential building containing 30 affordable housing units at 901 Los Medanos Street as well as an at-grade asphalt-paved parking lot at 295 East 10th Street.

2.0 SCOPE OF SERVICES

Our geotechnical investigation was performed in accordance with our proposal dated March 13, 2019. Our scope of services consisted of exploring the subsurface conditions at the site by advancing two cone penetration tests (CPTs), drilling two test borings, performing laboratory tests on selected soil samples, and performing engineering analyses to develop conclusions and recommendations regarding:

- subsurface conditions
- site seismicity and seismic hazards, including the potential for liquefaction and liquefaction-induced ground failure
- the most appropriate foundation type(s) for the proposed building
- design criteria for the recommended foundation type(s), including vertical and lateral capacities
- estimates of foundation settlement
- subgrade preparation for slab-on-grade floors and exterior concrete flatwork
- surface drainage and bio-swales
- site grading and fill placement, including fill quality and compaction requirements
- asphalt concrete (AC) and Portland-cement concrete (PCC) pavement sections
- 2016 California Building Code (CBC) site class and design spectral response acceleration parameters
- corrosivity of the near-surface soil and the potential effects on buried concrete and metal structures and foundations
- construction considerations.

3.0 FIELD INVESTIGATION AND LABORATORY TESTING

Subsurface conditions at the site were explored by advancing two CPTs, drilling two test borings, and performing laboratory testing on selected soil samples. Prior to performing the field exploration, we obtained a drilling permit from Contra Costa County Environmental Health Division (CCCEHD) and contacted Underground Service Alert (USA) to notify them of our work, as required by law. We also retained Precision Locating, a private utility locator, to check that the boring and CPT locations were clear of buried utilities. Details of our field investigation and laboratory testing are presented in this section.

3.1 Cone Penetration Tests

Two CPTs, designated as CPT-1 and CPT-2, were performed to provide in-situ soil data at the approximate locations shown on Figure 2. The CPTs were advanced to depths of about 51 and

53 feet below the ground surface (bgs) by Middle Earth Geo Testing, Inc. of Orange, California on April 1, 2019.

The CPTs were performed by hydraulically pushing a 1.7-inch-diameter cone-tipped probe with a projected area of 15 square centimeters into the ground. The cone-tipped probe measured tip resistance and the friction sleeve behind the cone tip measured frictional resistance. Electrical strain gauges within the cone continuously measured soil parameters for the entire depth advanced. Soil data, including tip resistance and frictional resistance, were recorded by a computer while the test was conducted. Accumulated data were processed by computer to provide engineering information such as the types and approximate strength characteristics of the soil encountered.

The CPT logs showing tip resistance, friction ratio, and pore pressure, as well as interpreted soil behavior type, are presented in Appendix A on Figures A-1 and A-2. Upon completion, the CPTs were backfilled with cement grout in accordance with CCCEHD requirements.

3.2 Test Borings

Two test borings, designated as B-1 and B-2, were drilled at the approximate locations shown on Figure 2 on April 16, 2019. The borings were drilled by Benevent Building of Concord, California using a limited-access drill rig equipped with solid-stem flight augers. Borings B-1 and B-2 were advanced to depths of 26-1/2 and 33 feet bgs, respectively. During drilling, our field engineer logged the soil encountered and collected representative samples of the soil for visual classification and laboratory testing. The boring logs are presented in Appendix A on Figures A-3 through A-4b. The soil was classified in accordance with the classification system presented on Figure A-5.

Soil samples were obtained using the following samplers:

- Sprague and Henwood (S&H) split-barrel sampler with a 3.0-inch outside-diameter and 2.5-inch inside-diameter, lined with 2.43-inch inside-diameter stainless steel tubes.

- Standard Penetration Test (SPT) split-barrel sampler with a 2.0-inch outside- and 1.5-inch inside-diameter, without liners.

The type of sampler used was selected based on soil type and the desired sample quality for laboratory testing. In general, the S&H sampler was used to obtain samples in medium stiff to very stiff cohesive soil and the SPT sampler was used to obtain samples of hard clay and to evaluate the relative density of cohesionless soil.

The samplers were driven with an above-ground, 140-pound safety hammer falling 30 inches per drop utilizing a rope-and-cathead system. The samplers were driven up to 18 inches and the hammer blows required to drive the samplers were recorded every six inches and are presented on the boring logs. A "blow count" is defined as the number of hammer blows per six inches of penetration or 50 blows for six inches or less of penetration. The blow counts required to drive the S&H and SPT samplers were converted to approximate SPT N-values using a factor of 0.7 and 1.2, respectively, to account for sampler type, approximate hammer energy, and the fact that the SPT sampler was driven without liners but was sized to accommodate them. The blow counts used for this conversion were the last two blow counts. The converted SPT N-values are presented on the boring logs.

Upon completion, the borings were backfilled with neat cement grout in accordance with CCCDEH requirements. The soil cuttings generated by the borings were left onsite.

3.3 Laboratory Testing

We obtained a near-surface soil sample (0 to 2 feet bgs), designated as R-1, at the approximate location shown on Figure 2 for a laboratory resistance value (R-value) test. We re-examined each soil sample in the office to confirm field classifications and selected representative samples for laboratory testing. Soil samples were tested to measure moisture content, dry density,

Atterberg limits[1] (plasticity index), gradation, R-value, and corrosion potential. The laboratory test results are presented on the boring logs and in Appendix B.

4.0 SUBSURFACE CONDITIONS

A regional geologic map prepared by Graymer (2000), a portion of which is presented on Figure 3, indicates the site at 901 Los Medanos Street is underlain by Holocene-age alluvium (Qha) while the site at 295 East 10th Street is underlain by Pleistocene-age alluvium (Qpa).

The results of our field investigation indicate the site for the proposed building at 901 Los Medanos Street is blanketed by about 2 to 4 feet of fill consisting of medium stiff to stiff sandy and gravelly clay. The fill is underlain by alluvium to the maximum depth explored of 53 feet bgs. Where explored, the alluvium generally consists of stiff to hard clay with varying sand content interbedded with occasional layers medium dense to very dense sand with variable amounts of clay and silt. The results of Atterberg limits tests performed on two samples of near-surface clay obtained from the test borings indicate the near-surface clay is moderately to highly expansive[2] with plasticity indices (PIs) of 22 and 30.

Groundwater was encountered in Borings B-1 and B-2 at a depth of 23 feet bgs during drilling. In addition, a pore pressure dissipation (PPD) test performed in CPT-2 indicated the depth to groundwater was about 23 feet bgs. Considering the low permeability of the clayey soil, the groundwater level encountered in the borings and CPTs may not represent stabilized groundwater conditions. To further evaluate depth to high groundwater, we reviewed the California Geological Survey report titled *Seismic Hazard Zone Report for the Honker-Bay, 7.5-Minute Quadrangle, Contra Costa County, California*, dated April 4 2019. This report indicates the historic high groundwater in the site vicinity is approximately 15 feet bgs. The depth to groundwater will vary several feet seasonally, depending on the amount of rainfall.

---

1 Atterberg limits are an indirect measure of the expansion potential of the soil.

2 Expansive soil undergoes volumetric changes with changes in moisture content (i.e. it shrinks when dried and swells when wetted).

5.0 SEISMIC CONSIDERATIONS

5.1 Regional Seismicity

The site is located in the Coast Ranges geomorphic province that is characterized by northwest-southeast trending valleys and ridges. These are controlled by folds and faults that resulted from the collision of the Farallon and North American plates and subsequent shearing along the San Andreas Fault system. Movement along this plate boundary in the Northern California region occur along right-lateral strike-slip faults of the San Andreas Fault system.

The major active faults in the area are the Calaveras, Hayward, and San Andreas faults. These and other known Quaternary-aged faults that are believed to be sources of major earthquakes (i.e. Magnitude>6.0) in the region are shown on Figure 4. For these and other active faults within a 75-kilometer radius of the site, the distance from the site and estimated mean characteristic Moment magnitude[3] [2007 Working Group on California Earthquake Probabilities (WGCEP) (USGS 2008) and Cao et al. (2003)] are summarized in Table 1.

[3] Moment magnitude is an energy-based scale and provides a physically meaningful measure of the size of a faulting event. Moment magnitude is directly related to average slip and fault rupture area.

TABLE 1
Regional Faults and Seismicity

Fault Segment	Approximate Distance from Site (km)	Direction from Site	Mean Characteristic Moment Magnitude
Great Valley 5, Pittsburg Kirby Hills	2.6	East	6.70
Green Valley Connected	15	West	6.80
Greenville Connected	17	Southeast	7.00
Mount Diablo Thrust	22	Southwest	6.70
Total Calaveras	26	Southwest	7.03
Great Valley 4b, Gordon Valley	29	North	6.80
West Napa	35	West	6.70
Total Hayward	37	West	7.00
Total Hayward-Rodgers Creek	37	West	7.33
Great Valley 7	45	Southeast	6.90
Rodgers Creek	49	West	7.07
Hunting Creek-Berryessa	55	Northwest	7.10
Great Valley 4a, Trout Creek	57	North	6.60
N. San Andreas - Peninsula	66	West	7.23
N. San Andreas (1906 event)	66	West	8.05
N. San Andreas - North Coast	66	West	7.51
San Gregorio Connected	71	West	7.50
Monte Vista-Shannon	73	Southwest	6.50
Great Valley 3, Mysterious Ridge	75	North	7.10

Since 1800, four major earthquakes have been recorded on the San Andreas Fault. In 1836, an earthquake with an estimated maximum intensity of VII on the Modified Mercalli (MM) scale occurred east of Monterey Bay on the San Andreas Fault (Toppozada and Borchardt 1998). The estimated Moment magnitude, M_w, for this earthquake is about 6.25. In 1838, an earthquake occurred with an estimated intensity of about VIII-IX (MM), corresponding to an M_w of about 7.5. The San Francisco Earthquake of 1906 caused the most significant damage in the history of the Bay Area in terms of loss of lives and property damage. This earthquake created a surface rupture along the San Andreas Fault from Shelter Cove to San Juan Bautista approximately 470 kilometers in length. It had a maximum intensity of XI (MM), an M_w of about 7.9, and was felt 560 kilometers away in Oregon, Nevada, and Los Angeles. The most recent earthquake to affect the Bay Area was the Loma Prieta Earthquake of October 17, 1989 with an M_w of 6.9. This earthquake occurred in the Santa Cruz Mountains about 110 kilometers southwest of the site.

In 1868, an earthquake with an estimated maximum intensity of X on the MM scale occurred on the southern segment (between San Leandro and Fremont) of the Hayward Fault. The estimated M_w for the earthquake is 7.0. In 1861, an earthquake of unknown magnitude (probably an M_w of about 6.5) was reported on the Calaveras Fault. The most recent significant earthquake on this fault was the 1984 Morgan Hill earthquake (M_w = 6.2).

The U.S. Geological Survey's 2014 Working Group on California Earthquake Probabilities has compiled the earthquake fault research for the San Francisco Bay area in order to estimate the probability of fault segment rupture. They have determined that the overall probability of moment magnitude 6.7 or greater earthquake occurring in the San Francisco Region during the next 30 years (starting from 2014) is 72 percent. The highest probabilities are assigned to the Hayward Fault, Calaveras Fault, and the northern segment of the San Andreas Fault. These probabilities are 14.3, 7.4, and 6.4 percent, respectively.

5.2 Seismic Hazards

Because the project site is in a seismically active region, we evaluated the potential for earthquake-induced geologic hazards including ground shaking, ground surface rupture, liquefaction,[4] lateral spreading,[5] and cyclic densification[6]. We used the results of our field investigation to evaluate the potential of these phenomena occurring at the project site.

5.2.1 Ground Shaking

The seismicity of the site is governed by the activity of the Great Valley 5, Green Valley Connected, and Greenville Connected faults, although ground shaking from future earthquakes on other nearby faults, including the Calaveras, Hayward and San Andreas faults, will also be felt at the site. The intensity of earthquake ground motion at the site will depend upon the characteristics of the generating fault, distance to the earthquake epicenter, and magnitude and duration of the earthquake. We judge that strong to very strong ground shaking could occur at the site during a large earthquake on one of the nearby faults.

5.2.2 Ground Surface Rupture

Historically, ground surface displacements closely follow the trace of geologically young faults. The site is **not** within an Earthquake Fault Zone, as defined by the Alquist-Priolo Earthquake Fault Zoning Act, and no known active or potentially active faults exist on the site. We therefore conclude the risk of fault offset at the site from a known active fault is very low. In a seismically active area, the remote possibility exists for future faulting in areas where no faults previously existed; however, we conclude the risk of surface faulting and consequent secondary ground failure from previously unknown faults is also very low.

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4 Liquefaction is a phenomenon where loose, saturated, cohesionless soil experiences temporary reduction in strength during cyclic loading such as that produced by earthquakes.

5 Lateral spreading is a phenomenon in which surficial soil displaces along a shear zone that has formed within an underlying liquefied layer. Upon reaching mobilization, the surficial blocks are transported downslope or in the direction of a free face by earthquake and gravitational forces.

6 Cyclic densification is a phenomenon in which non-saturated, cohesionless soil is compacted by earthquake vibrations, causing ground-surface settlement.

5.2.3 Cyclic Densification

Cyclic densification (also referred to as differential compaction) of non-saturated sand (sand above the groundwater table) can occur during an earthquake, resulting in settlement of the ground surface and overlying improvements. Based on the subsurface data from our field investigation, we conclude the soil above the groundwater table is not susceptible to cyclic densification because of its cohesion or relative density.

5.2.4 Liquefaction and Associated Hazards

Liquefaction is a phenomenon in which saturated soil temporarily loses strength from the build-up of excess pore water pressure, especially during earthquake-induced cyclic loading. Soil susceptible to liquefaction includes loose to medium dense sand and gravel, low-plasticity silt, and some low-plasticity clay deposits. Flow failure, lateral spreading, differential settlement, loss of bearing strength, ground fissures and sand boils are evidence of excess pore pressure generation and liquefaction.

The site has been mapped within a zone of liquefaction potential as shown on the map titled *State of California, Seismic Hazard Zones, Honker Bay Quadrangle, Official Map*, prepared by the California Geological Survey, dated April 4, 2019 (Figure 5). California Geological Survey has provided recommendations for procedures and report content for site investigations performed within seismic hazard zones in Special Publication 117 (SP-117), titled *Guidelines for Evaluating and Mitigating Seismic Hazard Zones in California*, dated September 11, 2008. SP-117 recommends subsurface investigations in mapped liquefaction hazard zones be performed using rotary-wash borings and/or CPTs.

We evaluated liquefaction potential at the site using the data collected in our CPTs. Liquefaction susceptibility was assessed using the software CLiq v2.2 (GeoLogismiki 2019). CLiq uses measured field CPT data and assesses liquefaction potential, including post-earthquake vertical settlement, given a user-defined earthquake magnitude and peak ground acceleration (PGA). Our liquefaction analyses were performed using the methodology proposed by Boulanger &

Idriss (2014). We also used the relationship proposed by Zhang, Robertson, and Brachman (2002) to estimate post-liquefaction volumetric strains and corresponding ground surface settlement; a relationship that is an extension of the work by Ishihara and Yoshimine (1992).

Our analyses were performed using an assumed high groundwater at 15 feet bgs. In accordance with the 2016 CBC, we used a peak ground acceleration (PGA) of 0.60 times gravity (g) in our liquefaction evaluation; this PGA is consistent with the Maximum Considered Earthquake Geometric Mean (MCE_G) peak ground acceleration adjusted for site effects (PGA_M). We also used a moment magnitude 7.33 earthquake, which is consistent with the mean characteristic moment magnitude for the Hayward Fault, as presented in Table 1.

The results of the liquefaction analysis indicate that there are thin soil layers or lenses, less than two feet thick, that are potentially liquefiable. Based on the results of our analyses, we estimate total and differential settlements associated with liquefaction after an MCE event generating a PGA of 0.60g will be less than 1/2 inch and 1/4 inch over a horizontal distance of 30 feet, respectively.

Ishihara (1985) presented an empirical relationship that provides criteria that can be used to evaluate whether liquefaction-induced ground failure, such as sand boils, would be expected to occur under a given level of shaking for a liquefiable layer of given thickness overlain by a resistant, or protective, surficial layer. Our analysis indicates the non-liquefiable soil overlying the potentially liquefiable soil layers is sufficiently thick and the uppermost potentially liquefiable layers are sufficiently thin such that the potential for surface manifestations of liquefaction, such as sand boils, are very low.

Considering the relatively flat site grades, as well as the depth, consistency, and discontinuous nature of the potentially liquefiable layers, we conclude the risk of lateral spreading at the site is nil.

6.0 DISCUSSIONS AND CONCLUSIONS

From a geotechnical standpoint, we conclude the site can be developed as planned, provided the recommendations presented in this report are incorporated into the project plans and specifications and implemented during construction. The primary geotechnical concerns for the site are: 1) the presences of moderate to highly expansive near-surface clay, and 2) providing adequate foundation support for the proposed building. These and other geotechnical issues as they pertain to the proposed development are discussed in the remainder of this section.

6.1 Expansive Soil

Atterberg limits tests performed on samples of the near-surface clay indicate the clay is moderately to highly expansive. Expansive near-surface soil is subject to volume changes during seasonal fluctuations in moisture content. These volume changes can cause movement and cracking of foundations, slabs and pavements. Therefore, foundations, pavements, and slabs should be designed and constructed to mitigate the effects of the expansive soil. In general, the effects of expansive soil can be mitigated by moisture-conditioning the expansive soil, providing non-expansive soil below slabs, and either supporting foundations below the zone of severe moisture change or by providing a stiff, shallow foundation that can limit deformation of the superstructure as the underlying soil shrinks and swells.

At expansive soil sites, it is critical to properly manage surface and subsurface drainage to prevent water from collecting beneath pavements, slabs and foundations. If permeable pavements, tree wells, irrigated landscaped zones, and storm water infiltration basins will be constructed close to the proposed building, they should incorporate design elements that prevent saturation of the soil adjacent to and below building foundations. While the objective of permeable pavement systems and infiltration basins is to allow for water storage and infiltration, we conclude that infiltration into the subgrade soil is not feasible at this site due to the low permeability of the moderately to highly expansive clay. Furthermore, from a geotechnical standpoint, water should not be allowed to collect alongside or beneath the building foundations, pavements and flatwork. This can be achieved by providing subdrain systems and impermeable

liners beneath permeable surfaces and installing vertical barriers between permeable surfaces underlain by subdrains and non-permeable surfaces underlain by conventional aggregate base.

6.2 Foundation Support and Settlement

The site is blanketed by 2 to 4 feet of fill overlying firm native alluvium that has moderate strength and relatively low compressibility. We conclude the proposed building may be supported on individual spread footings at interior column locations and a continuous, deepened perimeter footing bearing on firm native alluvium. The perimeter footing should be deepened to act as a barrier to reduce the potential for moisture change beneath the slab-on-grade floor.

We estimate total and differential settlements of properly constructed spread footings, designed using the allowable bearing pressures presented in Section 7.3 of this report, will be less than 3/4 inch and 1/2 inch over a 30-foot horizontal distance, respectively.

6.3 Slab-on-Grade Floor

The building slab-on-grade floor and capillary break/vapor barrier should be underlain by at least 12 inches of non-expansive soil. The following two alternatives may be used to provide a 12-inch-thick layer of non-expansive soil beneath the slab-on-grade floor.

- Alternative No. 1: The building pad should be overexcavated to allow for placement of 12 inches of imported select (non-expansive) fill beneath the floor slab and capillary break/vapor retarder.
- Alternative No. 2: As an alternative to importing select fill, the upper 12 inches of soil beneath the building pad subgrade may be treated in place with lime. The purpose of the lime treatment is to reduce the expansion potential of the surface soil and provide a firm surface for construction of the floor slab.

We judge exterior concrete slabs-on-grade (i.e. concrete flatwork) should perform satisfactorily if they are supported on a layer of non-expansive soil at least 12 inches thick (measured beneath the aggregate base layer).

6.4 Construction Considerations

The soil to be excavated for the new foundations and underground utilities is expected to be predominantly clay. If site grading is performed during the rainy season, the clay will likely be wet and will have to be dried before compaction can be achieved. Heavy rubber-tired equipment could cause excessive deflection (pumping) of the wet clay and, therefore, should be avoided.

Excavations that will be deeper than five feet and will be entered by workers should be sloped or shored in accordance with CAL-OSHA standards (29 CFR Part 1926). The contractor should be responsible for the construction and safety of temporary slopes.

6.5 Soil Corrosivity

Laboratory testing was performed by Project X Corrosion Engineering of Murrieta, California on two samples of soil obtained from Boring B-1 at a depth of 4 feet bgs and Boring B-2 at a depth of 3 feet bgs. The results of the test are presented in Appendix B of this report.

The resistivity test results (804 and 1,072 ohm-cm) indicate the near-surface soil is "moderately to highly corrosive" to buried metallic structures. Accordingly, all buried iron, steel, cast iron, ductile iron, galvanized steel and dielectric-coated steel or iron may need to be protected against corrosion depending upon the critical nature of the structure. If it is necessary to have metal in contact with soil, a corrosion engineer should be consulted to provide recommendations for corrosion protection.

The chloride ion concentrations (8.3 and 4.1 mg/kg) and pH (8.2) indicate the near-surface soil is "negligibly corrosive" to buried metallic structures and reinforcing steel in concrete structures below ground. The results also indicate the sulfate ion concentrations are sufficiently low such that sulfates do not to pose a threat to buried concrete.

7.0 RECOMMENDATIONS

Our recommendations for site preparation and grading, foundation design, and other geotechnical aspects of the project are presented in this section.

7.1 Site Preparation and Grading

Any vegetation and organic topsoil should be stripped in areas to receive improvements (i.e., building, pavement or flatwork). Site demolition should include removal of all existing pavements, former foundation elements, and underground utilities. In general, abandoned underground utilities should be removed to the property line or service connections and properly capped or plugged with concrete. Where existing utility lines are outside of the footprint of the proposed building and will not interfere with the proposed construction, they may be abandoned in-place provided the lines are filled with lean concrete or cement grout to the property line. Voids resulting from demolition activities that extends below finished improvements should be properly backfilled with engineered fill under our observation and following the recommendations provided later in this section.

If grading work is performed during the rainy season, the contractor may find the subgrade material too wet to compact to the recommended relative compaction and will have to be scarified and aerated to lower its moisture content so the specified compaction can be achieved. Material to be dried by aeration should be scarified to a depth of at least eight inches; the scarified soil should be turned at least twice a day to promote uniform drying. Once the moisture content of the aerated soil has been reduced to acceptable levels, the soil should be compacted in accordance with our recommendations. Aeration typically is the least costly method used to stabilize the subgrade soil; however, it generally requires the most time to complete. Other soil stabilization alternatives include overexcavating the wet soil and replacing or mixing it with drier soil, and lime-treatment.

It is also important that the moisture content of subgrade soil is sufficiently high to reduce the expansion potential. If the grading work is performed during the dry season, moisture-conditioning (i.e. adding water) will likely be required.

7.1.1 Subgrade Preparation

After site clearing and demolition is completed, in areas that will receive improvements (i.e. building pad, pavement, and exterior concrete flatwork) or fill, the soil subgrade exposed should be scarified to a depth of at least eight inches, and moisture-conditioned and compacted in accordance with the requirements presented below in Table 2 (Section 7.1.2).

The near-surface clay at the site has a moderate to high expansion potential. To mitigate the detrimental effects of moderately to highly expansive near-surface soil, the building slab-on-grade floor should be underlain by at least 12 inches of non-expansive soil consisting of select fill or lime-treated on-site soil. The non-expansive soil should extend at least five feet beyond the perimeter of the proposed building, except where constrained by the property line or landscaping.

7.1.2 Fill Materials and Compaction Criteria

The expansive soil subgrade beneath various surface improvements, such as building pad and concrete flatwork, will require moisture-conditioning to limit its expansion potential. Where required, as determined by our field engineer, the expansive clay subgrade should be scarified to a depth of least eight inches, moisture-conditioned and compacted to the specified percent relative compaction[7], as presented below in Table 2. Note that "moisture-conditioning" may require wetting or drying of the soil, depending on the particular conditions encountered. All fill should be placed in horizontal lifts not exceeding eight inches in loose thickness, moisture-conditioned, and compacted in accordance with the requirements provided below in Table 2. Each type of material is described in the following text according to its uses and specifications.

TABLE 2
Summary of Compaction Requirements

Location	Required Relative Compaction (percent)	Moisture Requirement
Building pad – expansive clay	87 – 92	4+% above optimum
Building pad – low-plasticity soil	90+	Above optimum
Exterior slabs – expansive clay	87 – 92	4+% above optimum
Exterior slabs – low-plasticity soil	90+	Above optimum
Pavements – expansive clay	90+	2+% above optimum
Pavements – low-plasticity soil	95+	Above optimum
Pavements - aggregate base	95+	Near optimum
General fill – expansive clay	87 – 92	4+% above optimum
General fill – low-plasticity soil	90+	Above optimum
General fill – granular soil	95+	Near optimum
Utility trench backfill – expansive clay	87 – 92	4+% above optimum
Utility trench backfill – low-plasticity	90+	Above optimum
Utility trench - clean sand or gravel	95+	Near optimum

Note: Select fill and lime-treated clay are considered low-plasticity soil.

On-site Soil

On-site soil may be used as general fill, provided the material is free of organic matter, contain no rocks or lumps larger than three inches in greatest dimension, and be approved by the Geotechnical Engineer.

Select Fill

Select fill should consist of on-site or imported soil that is free of organic matter, contain no

[7] Relative compaction refers to the in-place dry density of soil expressed as a percentage of the maximum dry density of the same material, as determined by the ASTM D1557 laboratory compaction procedure.

rocks or lumps larger than three inches in greatest dimension, have a liquid limit less than 40 and plasticity index less than 12, and be approved by the Geotechnical Engineer. Samples of proposed select fill material should be submitted to the Geotechnical Engineer at least three business days prior to use at the site.

The grading contractor should provide analytical test results or other suitable environmental documentation indicating the imported fill is free of hazardous materials at least three days before use at the site. If this data is not provided, a minimum of two weeks will be required to perform any necessary analytical testing.

Aggregate Base Material

Imported aggregate base material may be used as general fill, trench backfill (above bedding materials), or as select fill beneath building pad or exterior concrete flatwork. Aggregate base should meet the requirements in the 2015 Caltrans Standard Specifications, Section 26, for Class 2 aggregate base (3/4-inch maximum).

Controlled Low-Strength Material

Controlled low-strength material (CLSM) may be considered as an alternative to fill beneath the building, concrete flatwork, or pavement. CLSM should meet the requirements in the 2015 Caltrans Standard Specifications. It is an ideal backfill material when adequate room is limited or not available for conventional compaction equipment, or when settlement of the backfill must be minimized. No compaction is required to place CLSM. CLSM should have a minimum 28-day unconfined strength of 100 pounds per square inch (psi).

7.1.3 Lime-Treated Soil

Lime treatment of fine-grained soils generally includes site preparation, application of lime, mixing, compaction, and curing of the lime-treated soil. Field quality control measures should include checking the depth of lime treatment, degree of pulverization, lime spread rate measurement, lime content measurement, and moisture content and density measurements, and mixing efficiency.

The lime treatment process should be designed by a contractor specializing in its use and who is experienced in the application of lime in similar soil conditions. Based on our experience with lime treatment, we judge that the specialty contractor should be able to treat the moderately to highly expansive on-site clay to produce a non-expansive fill beneath building slab-on-grade and exterior concrete flatwork. For planning purposes, we recommend assuming the lime treatment will consist of at least five percent of dolomitic quicklime by dry weight of soil. An average dry unit weight of 105 pounds per cubic foot (pcf) should be assumed for design purposes. The specialty contractor should confirm this amount is suitable with a laboratory lime-demand test and prepare a treatment specification for our review prior to construction.

Prior to lime treatment, we recommend the site be graded to a level pad elevation in accordance with our previous recommendations and all below-grade obstructions be removed. The soil treated with lime should be mixed and compacted in one lift. The lime should be thoroughly blended with the soil and allowed to set for 24 hours prior to remixing and compaction. The lime-treated soil should be moisture-conditioned to above optimum moisture content and compacted to at least 90 percent relative compaction. It should be noted that disposal of lime-treated soil is typically expensive because of the high pH of the treated soil. In addition, lime-treated soil should be completely removed from landscape areas.

7.1.4 Utility Trench Backfill

Excavations for utility trenches can be readily made with a backhoe. All trenches should conform to the current CAL-OSHA requirements. To provide uniform support, pipes or conduits should be bedded on a minimum of four inches of sand or fine gravel. After the pipes and conduits are tested, inspected (if required) and approved, they should be covered to a depth of six inches with sand or fine gravel, which should be mechanically tamped. The pipe bedding and cover should be eliminated where an impermeable plug is required as described below.

Backfill for utility trenches and other excavations is also considered fill, and should be placed and compacted as according to the recommendations previously presented. If imported clean

sand or gravel (defined as poorly graded soil with less than five percent fines) is used as backfill, it should be compacted to at least 95 percent relative compaction. Jetting of trench backfill should not be permitted. Special care should be taken when backfilling utility trenches in pavement areas. Poor compaction may cause excessive settlements, resulting in damage to the improvements above the fill.

Where utility trenches enter the building pad, an impermeable plug consisting of CLSM, at least three feet in length, should be installed where the trenches enter the building footprint. Furthermore, where sand- or gravel-backfilled trenches cross planter areas and pass below asphalt or concrete pavements, a similar plug should be placed at the edge of the pavement. The purpose of these recommendations is to reduce the potential for water to become trapped in trenches beneath the building or pavements. This trapped water can cause heaving of soils beneath slabs and softening of subgrade soil beneath pavements.

Foundations for the proposed building should be bottomed below an imaginary line extending up at a 1.5:1 (horizontal:vertical) inclination from the base of the utility trenches running parallel to the foundation. Alternatively, the portion of the utility trench (excluding bedding) that is below the 1.5:1 line can be backfilled with CLSM (see Section 7.1.2 for material requirements). If utility trenches are to be excavated below this zone-of-influence line after construction of the building foundations, the trench walls need to be fully supported with shoring until CLSM is placed.

7.1.5 Exterior Concrete Flatwork

We recommend a minimum of 12 inches of select fill or lime-treated on-site soil be placed beneath proposed exterior concrete flatwork, including patio slabs and sidewalks; the select fill should extend at least six inches beyond the slab edges, except where constrained by property lines. Select fill beneath exterior slabs-on-grade, such as patios and sidewalks, should be moisture-conditioned and compacted in accordance with the requirements presented in Table 2.

Lime treatment of the upper 12 inches of the native clay may be used in lieu of placement of select fill.

Even with 12 inches of non-expansive soil, exterior slabs may experience some cracking due to shrinking and swelling of the underlying expansive soil. Thickening the slab edges and adding additional reinforcement will control this cracking to some degree. Where slabs are adjacent to landscaped areas, thickening the concrete edge will help control water infiltration beneath the slabs. In addition, where slabs provide access to the building, it would be prudent to dowel the entrance to the building to permit rotation of the slab as the exterior ground shrinks and swells and to prevent a vertical offset at the entries.

7.2 Surface Drainage and Landscaping

7.2.1 Surface Drainage

Positive surface drainage should be provided around the building to direct surface water away from the foundations. To reduce the potential for water ponding adjacent to the building, we recommend the ground surface within a horizontal distance of five feet from the building slope down away from the building with a surface gradient of at least two percent in unpaved areas and one percent in paved areas. In addition, roof downspouts should be discharged into controlled drainage facilities to keep the water away from the foundations. The use of water-intensive landscaping around the perimeter of the building should be avoided to reduce the amount of water introduced to the expansive clay subgrade.

Care should be taken to minimize the potential for subsurface water to collect beneath flatwork and pavements. Where landscape beds and tree wells are immediately adjacent to pavements or flatwork that are not designed as permeable systems, we recommend vertical cutoff barriers be incorporated into the design to prevent irrigation water from saturating the subgrade and aggregate base. These barriers may consist of either flexible impermeable membranes or deepened concrete curbs.

7.2.2 Landscaping

Prior experience and industry literature indicate that some species of high water-demand[8] trees can induce ground-surface settlement by drawing water from the expansive clay, causing it to shrink. Where these types of trees are planted near buildings, the ground-surface settlement may result in damage to structures. This problem usually occurs 10 or more years after planting, as the trees reach mature height. To reduce the risk of tree-induced, building settlement, we recommend trees of the following genera not be planted within 25 feet of the proposed building unless adequate deep irrigation is provided at the tree locations: *Eucalyptus, Populus, Quercus, Crataegus, Salix, Sorbus* (simple-leafed), *Ulmus, Cupressus, Chamaecyparis,* and *Cupressocyparis.* Because this is a limited list and does not include all genera that may induce ground-surface settlement, a tree specialist should be consulted prior to selection of trees to be planted at the site.

7.2.3 Bioswales

The primary concerns with bioswales are: 1) providing suitable support for foundations and curbs constructed near the bioswales, and 2) potential for subsurface water from the bioswales to migrate (and possibly build up) beneath pavements and the proposed building. Consequently, we recommend that: 1) bioswales constructed at the site be provided with underdrains and/or drain inlets, and 2) bioswales be constructed no closer than five feet from the building. The subdrain pipes should be installed eight inches above the bottom of the bottom of the bioswale for treatment areas that are at least five feet away from the new building and pavements. The intent of this recommendation is to allow infiltration into the underlying soil, but to reduce the potential for bio-retention areas to flood during periods of heavy rainfall. The sides of bioswales should be sloped at a maximum gradient of 1.5:1 (horizontal:vertical).

Where bioswales must be located within five feet of the new building and pavements, the bottom of the bioswale should be lined with an impermeable liner. Where a vertical curb or foundation

is constructed near a bioswale, the curb and the edge of the foundation should be founded below an imaginary line extending up at an inclination of 1.5:1 (horizontal:vertical) from the base of the bioswale.

7.3 Spread Footings

The proposed building may be supported on a deepened continuous perimeter footing and isolated interior spread footings bearing on firm native alluvium. Continuous footings should be at least 18 inches wide and isolated spread footings should be at least 24 inches wide. The perimeter footing should be continuous and should be bottomed at least 30 inches below the lowest adjacent exterior finished grade. The perimeter footing embedment depth may be decreased by six inches where pavement or concrete flatwork is adjacent to the new building. Where the perimeter footing is constructed near a bio-retention area, the footing should be founded below an imaginary line extending up at an inclination of 1.5:1 (horizontal: vertical) from the base of the bio-retention area. Interior footings should be bottomed at least 24 inches below the bottom of the capillary moisture break.

Footings may be designed using an allowable bearing pressure of 4,000 pounds per square foot (psf) for dead-plus-live loads; this value may be increased by one-third for total design loads, which include wind or seismic forces. The recommended allowable bearing pressures for dead-plus-live loads and total loads include factors of safety of at least 2.0 and 1.5, respectively.

Lateral loads may be resisted by a combination of passive pressure on the vertical faces of the footings and friction between the bottoms of the footings and the supporting soil. To compute lateral resistance of footings, we recommend using an allowable passive pressure of 1,500 psf (uniform distribution) for transient loads and an equivalent fluid weight (triangular distribution) of 260 pounds per cubic foot (pcf) for sustained loads. Passive pressure in the upper one foot of soil should be neglected unless confined by a slab or pavement. Frictional resistance should be

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[8] "Water-demand" refers to the ability of the tree to withdraw large amounts of water from the soil subgrade, rather than soil suction exerted by the root system.

computed using a base friction coefficient of 0.3. The passive pressure and frictional resistance values have included a factor of safety of at least 1.5 and may be used in combination without reduction.

Footings should bottom on firm native alluvium. Where fill or other unsuitable bearing material is encountered at the bottom of footing excavations, the fill/unsuitable material should be removed and the overexcavation should be backfilled with lean concrete or CLSM. If footings are excavated during the rainy season, they should incorporate a rat slab to protect the footing subgrade. This will involve overexcavating the footing by about 2 to 3 inches and placing lean concrete or CLSM in the bottom (following inspection by the Geotechnical Engineer). A rat slab will help protect the footing subgrade during placement of reinforcing steel. The bottoms and sides of the footing excavations should be moistened following excavation and maintained in a moist condition until concrete is placed. Footing excavations should be free of standing water, debris, and disturbed materials prior to placing concrete. We should check footing excavations prior to placement of reinforcing steel or rat slab to check for proper bearing and preparation. We should also re-examine the excavations just prior to placement of concrete to confirm the bottoms and sides of the excavations have sufficient moisture content.

7.4 Concrete Slab-on-Grade Floors

As discussed in Section 7.1.1, the slab-on-grade floor should be underlain by at least 12 inches of non-expansive soil consisting of either imported select fill or lime-treated on-site soil. The capillary break material discussed below should not be counted as part of the non-expansive soil.

If water vapor moving through the slab is considered detrimental, we recommend installing a capillary moisture break and water vapor retarder beneath the slab. A capillary moisture break consists of at least four inches of clean, free-draining gravel or crushed rock. The particle size of the capillary break material should meet the gradation requirements presented in Table 3.

TABLE 3
Gradation Requirements for Capillary Moisture Break

Sieve Size	Percentage Passing Sieve
1 inch	90 – 100
3/4 inch	30 – 100
1/2 inch	5 – 25
3/8 inch	0 – 6

The vapor retarder should meet the requirements for Class B vapor retarders stated in ASTM E1745. The vapor retarder should be placed in accordance with the requirements of ASTM E1643. These requirements include overlapping seams by six inches, taping seams, and sealing penetrations in the vapor retarder.

Concrete mixes with high water/cement (w/c) ratios result in excess water in the concrete, which increases the cure time and results in excessive vapor transmission through the slabs. Where the concrete is poured directly over the vapor retarder, we recommend the w/c ratio of the concrete not exceed 0.45. Water should not be added to the concrete mix in the field. If necessary, workability should be increased by adding plasticizers. In addition, the slabs should be properly cured. Before the floor covering is placed, the contractor should check that the concrete surface and the moisture emission levels (if emission testing is required) meet the manufacturer's requirements.

7.5 Pavement Design

Design recommendations for asphalt and Portland cement concrete pavements are presented in the following sections.

7.5.1 Flexible (Asphalt Concrete) Pavement Design

The State of California flexible pavement design method was used to develop the recommended asphalt concrete pavement sections. The final soil subgrade in pavement areas will likely consist of clay. The results of a laboratory R-value test performed on a sample of near surface soil (R-1

at 0 to 2 feet bgs) obtained from the proposed surface parking lot site indicates the soil has a resistance value (R-value) of 5. On the basis of the R-value test results and our experience with expansive clay sites, we selected a minimum R-value of 5 for asphalt concrete pavement design. Recommended pavement sections for traffic indices (TIs) ranging from 4.5 to 6.5 are presented in Table 4. The civil engineer for the project should check that the TI's presented in this report are appropriate for the intended use. We can provide additional pavement sections for different TIs upon request.

TABLE 4
AC Pavement Sections

TI	Asphaltic Concrete (inches)	Class 2 Aggregate Base R = 78 (inches)
4.5	2.5	9.5
5.0	3.0	10.0
5.5	3.0	12.0
6.0	3.5	13.0
6.5	4.0	13.5

The upper eight inches of the subgrade should be moisture-conditioned and compacted in accordance with requirements presented in Section 7.1 and be non-yielding. The aggregate base should be moisture conditioned to near optimum and compacted to at least 95 percent relative compaction and be non-yielding.

If pavements are adjacent to irrigated landscaped areas, curbs adjacent to those areas should extend through the aggregate base and at least three inches into the underlying soil to reduce the potential for irrigation water to infiltrate into the pavement section. If drip irrigation is used in the landscaping adjacent to the pavement, however, the deepened curb is not required.

Where pavement is constructed near bio-swales or other storm water treatment areas, curbs should be deepened so that the base is founded below an imaginary line extending up at an

inclination of 1.5:1 (horizontal:vertical) from the base of the bio-swale/treatment area. Further, deepened curbs near bioswales may require some type of lateral restraint. The need for lateral restraint of deepened curbs should be evaluated during design of the biotreatment features.

7.5.2 Rigid (Portland-Cement Concrete) Pavement Design

The Portland-cement concrete (PCC) pavement section design is based on a maximum single-axle load of 20,000 pounds and a maximum tandem axle of 32,000 pounds (i.e., several garbage trucks per week). The recommended rigid pavement section for these axle loads is 6.5 inches of Portland-cement concrete over six inches of Class 2 aggregate base. For areas that will receive fire truck traffic, the pavement section should consist of seven inches of Portland-cement concrete over six inches of Class 2 aggregate base.

The modulus of rupture and unconfined compressive strength of the concrete should be at least 500 and 3,200 psi at 28 days, respectively. Contraction joints should be placed at a 15-foot spacing. Where the outer edge of a concrete pavement meets asphalt pavement, the concrete slab should be thickened by 50 percent at a taper not to exceed a slope of 1 in 10. For loading docks or bus stops, we recommend the concrete slab be reinforced with a minimum of No. 4 bars at 16 inches on center in both directions.

Recommendations for subgrade preparation and aggregate base compaction for concrete pavement are the same as those we have described above for asphalt concrete pavement. Recommendations for pavements adjacent to irrigated landscaped areas, bio-swales, or other storm water treatment areas are also the same as those presented above for asphalt concrete pavement.

7.6 Seismic Design

For design in accordance with the 2016 CBC, we recommend Site Class D be used. The latitude and longitude of the site are 38.0282° and -121.8827°, respectively. Hence, in accordance with the 2016 CBC, we recommend the following:

- S_S = 1.571g, S_1 = 0.60g
- S_{MS} = 1.571g, S_{M1} = 0.90g
- S_{DS} = 1.047g, S_{D1} = 0.60g
- Seismic Design Category D for Risk Categories I, II, and III.

8.0 GEOTECHNICAL SERVICES DURING CONSTRUCTION

Prior to construction, Rockridge Geotechnical should review the project plans and specifications to verify that they conform to the intent of our recommendations. During construction, our field engineer should provide on-site observation and testing during site preparation, placement and compaction of fill, and installation of building foundations. These observations will allow us to compare actual with anticipated subsurface conditions and to verify that the contractor's work conforms to the geotechnical aspects of the plans and specifications.

9.0 LIMITATIONS

This geotechnical investigation has been conducted in accordance with the standard of care commonly used as state-of-practice in the profession. No other warranties are either expressed or implied. The recommendations made in this report are based on the assumption that the subsurface conditions do not deviate appreciably from those disclosed in the borings and CPTs. If any variations or undesirable conditions are encountered during construction, we should be notified so that additional recommendations can be made. The foundation recommendations presented in this report are developed exclusively for the proposed development described in this report and are not valid for other locations and construction in the project vicinity.

REFERENCES

2016 California Building Code

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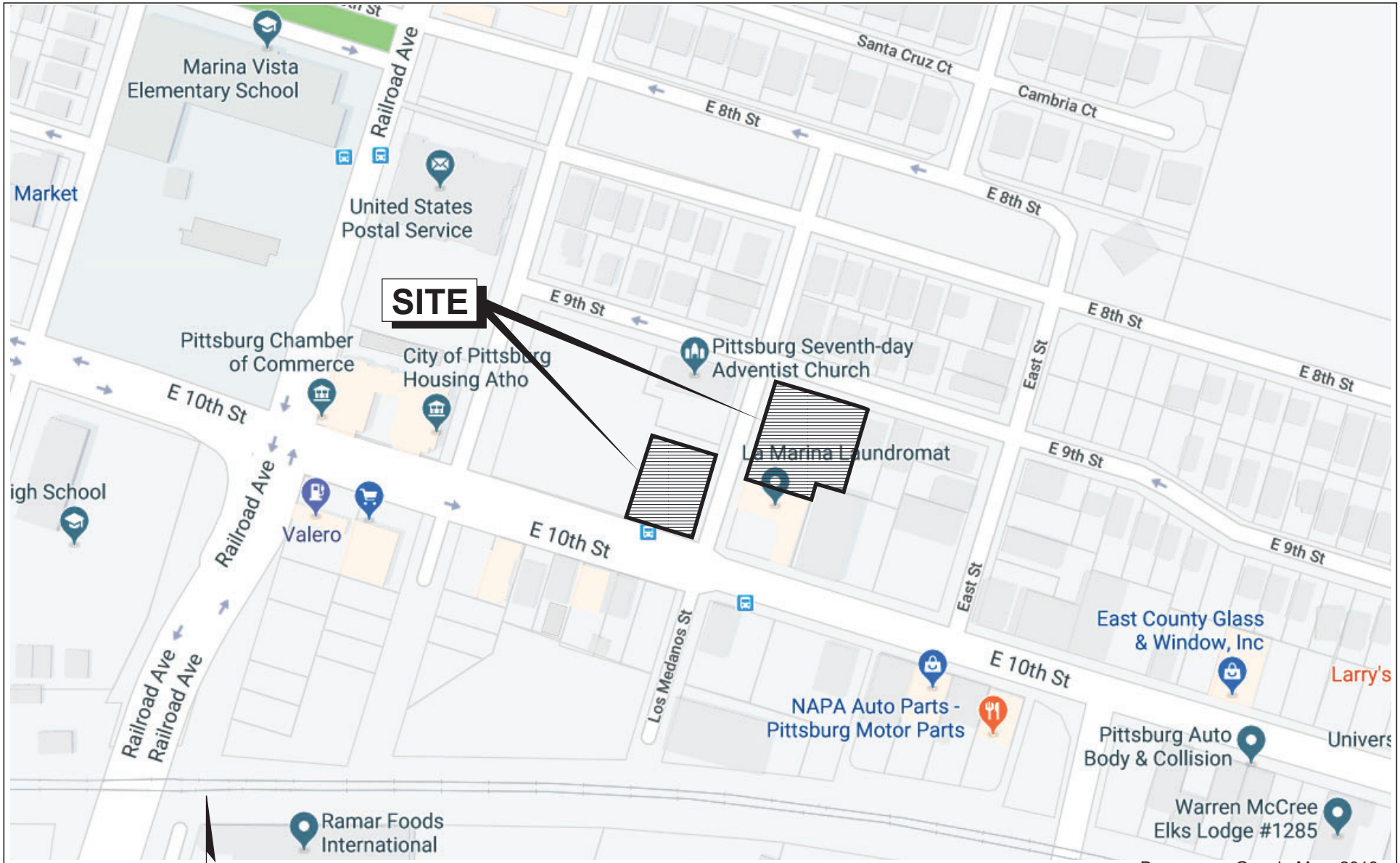
ROCKRIDGE GEOTECHNICAL

FIGURES



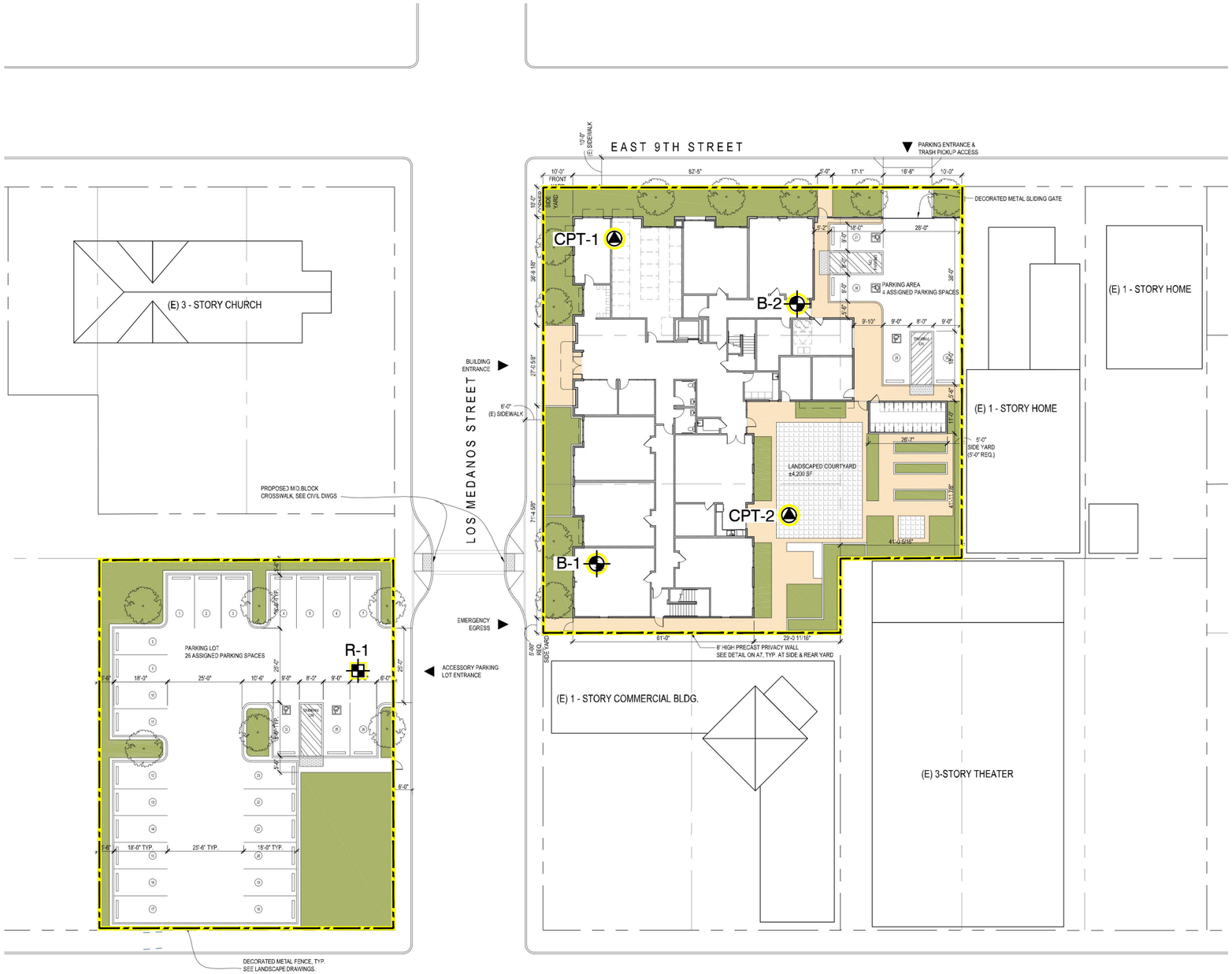
Base map: Google Map, 2018

VETERAN'S SQUARE
901 LOS MEDANOS STREET
Pittsburg, California

ROCKRIDGE GEOTECHNICAL

SITE LOCATION MAP

Date 05/08/19	Project No. 19-1661	Figure 1



EXPLANATION

CPT-1 — Approximate location of cone penetration test by Rockridge Geotechnical Inc., April 1, 2019

B-1 — Approximate location of boring by Rockridge Geotechnical Inc., April 16, 2019

R-1 — Approximate location of near-surface (0-2 feet) soil sample for R-value test

Project limits

0 40 Feet

Approximate scale

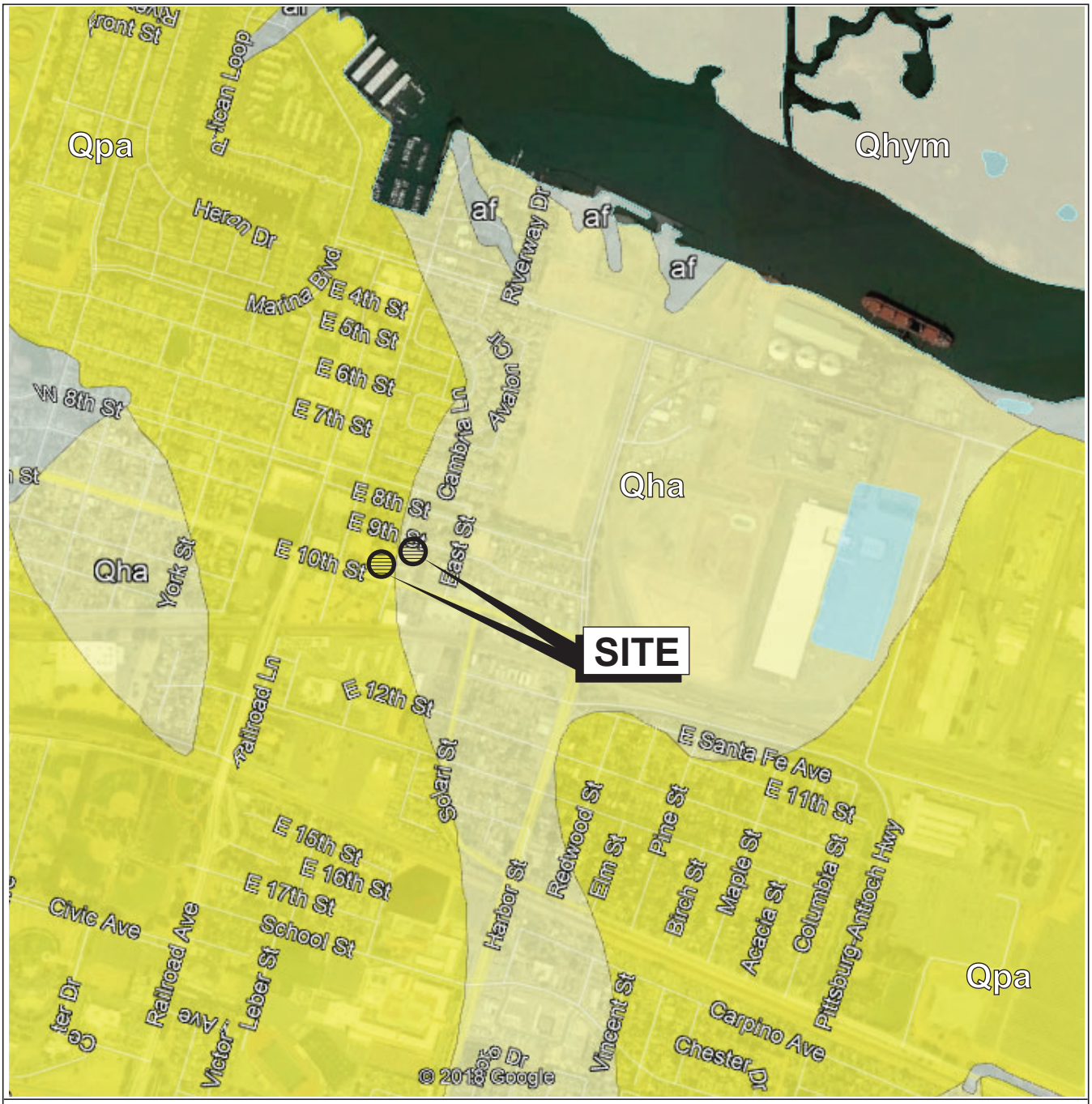
Reference: Base map from a drawing titled "Project Site Plan", by YHLA Archtiects, dated December 6, 2018.

VETERAN'S SQUARE
901 LOS MEDANOS STREET
Pittsburg, California

SITE PLAN

Date 05/30/19	Project No. 19-1661	Figure 2

ROCKRIDGE GEOTECHNICAL



Base map: Google Earth with U.S. Geological Survey (USGS), Contra Costa County, 2018.

EXPLANATION

af	Artificial Fill
Qhym	Mud deposits (late Holocene)
Qha	Alluvium (Holocene)
Qpa	Alluvium (Pleistocene)

Geologic contact:
dashed where approximate and dotted where concealed, queried where uncertain

0 1,000 2,000 Feet

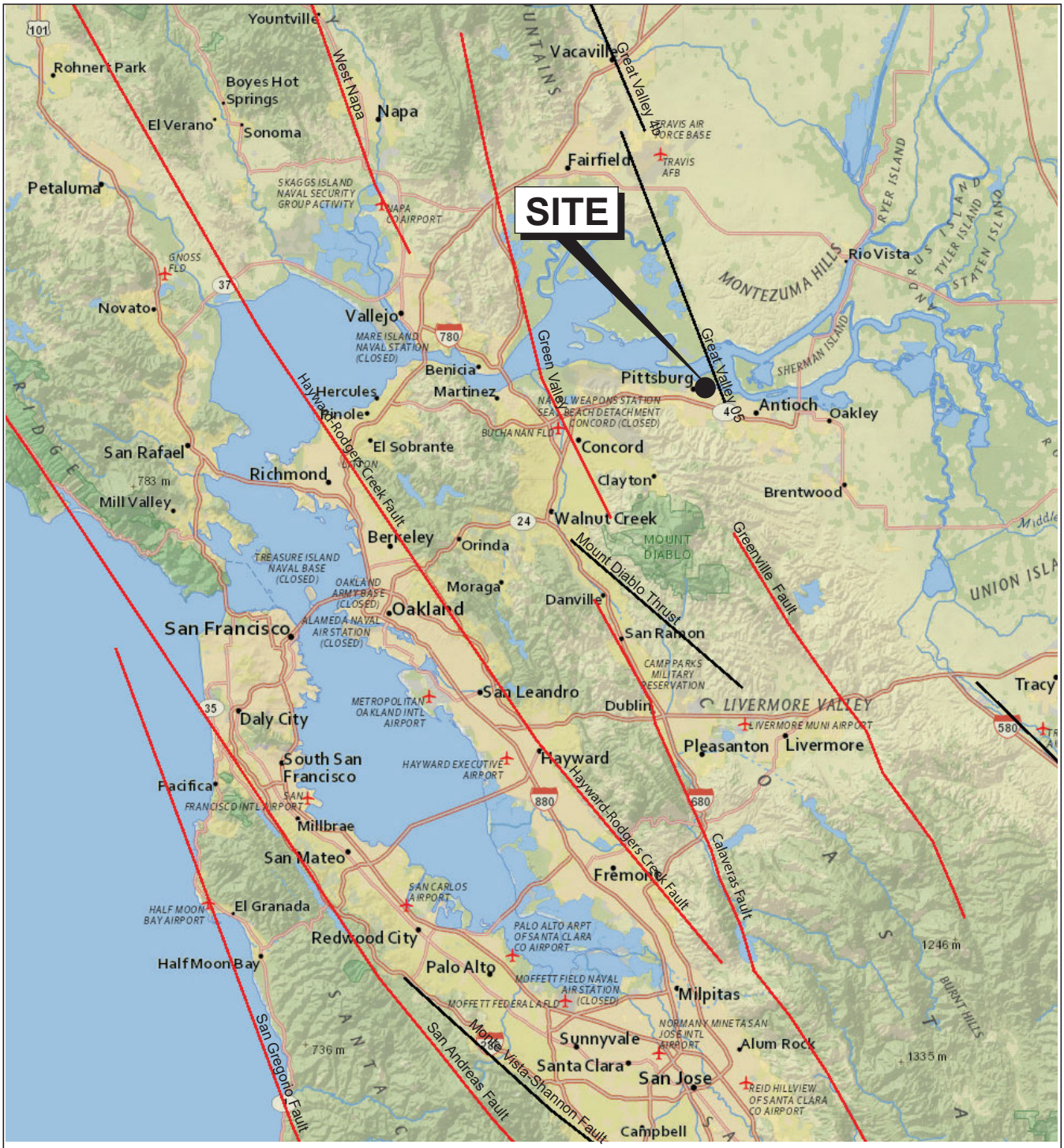
Approximate scale

VETERAN'S SQUARE
901 LOS MEDANOS STREET
Pittsburg, California

ROCKRIDGE GEOTECHNICAL

REGIONAL GEOLOGIC MAP

Date 05/15/19 | Project No. 19-1661 | Figure 3



Base Map: U.S. Geological Survey (USGS), National Seismic Hazards Maps - Fault Sources, 2008.

EXPLANATION

- Strike slip
- Thrust (Reverse)
- Normal

N

0 5 10 Miles

Approximate scale

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901 LOS MEDANOS STREET
Pittsburg, California

ROCKRIDGE GEOTECHNICAL

REGIONAL FAULT MAP

Date 05/08/19	Project No. 19-1661	Figure 4

Reference: https://maps.conservation.ca.gov/cgs/EQZApp/app/ (California Geological Survey, 2019) Honker Bay Quadrangle, Released April 4, 2019.

EXPLANATION

Liquefaction; Areas where historic occurence of liquefaction, or local topographic, geological, geotechnical, and subsurface water conditions indicate a potential for permanent ground displacements.

Earthquake-Induced Landslides; Areas where previous occurence of landslide movement, or local topographic, geological, geotechnical, and subsurface water conditions indicate a potential for permanent ground displacements.

N

0 0.4 0.8 Miles

Approximate scale

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Pittsburg, California

ROCKRIDGE GEOTECHNICAL

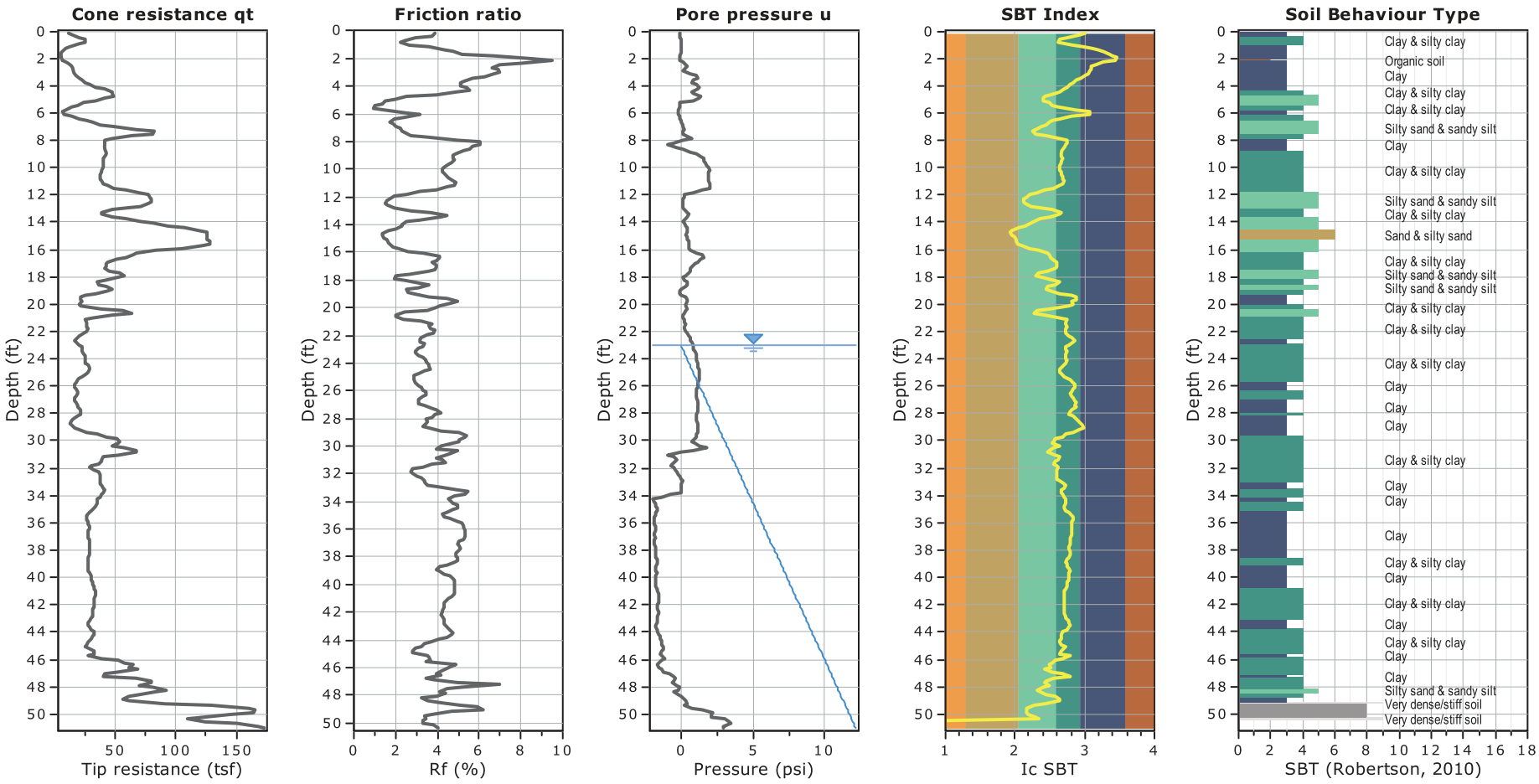
SEISMIC HAZARDS ZONE MAP

Date 05/20/19 | Project No. 19-1661 | Figure 5

ROCKRIDGE GEOTECHNICAL

APPENDIX A

Cone Penetration Test Results and Boring Logs



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

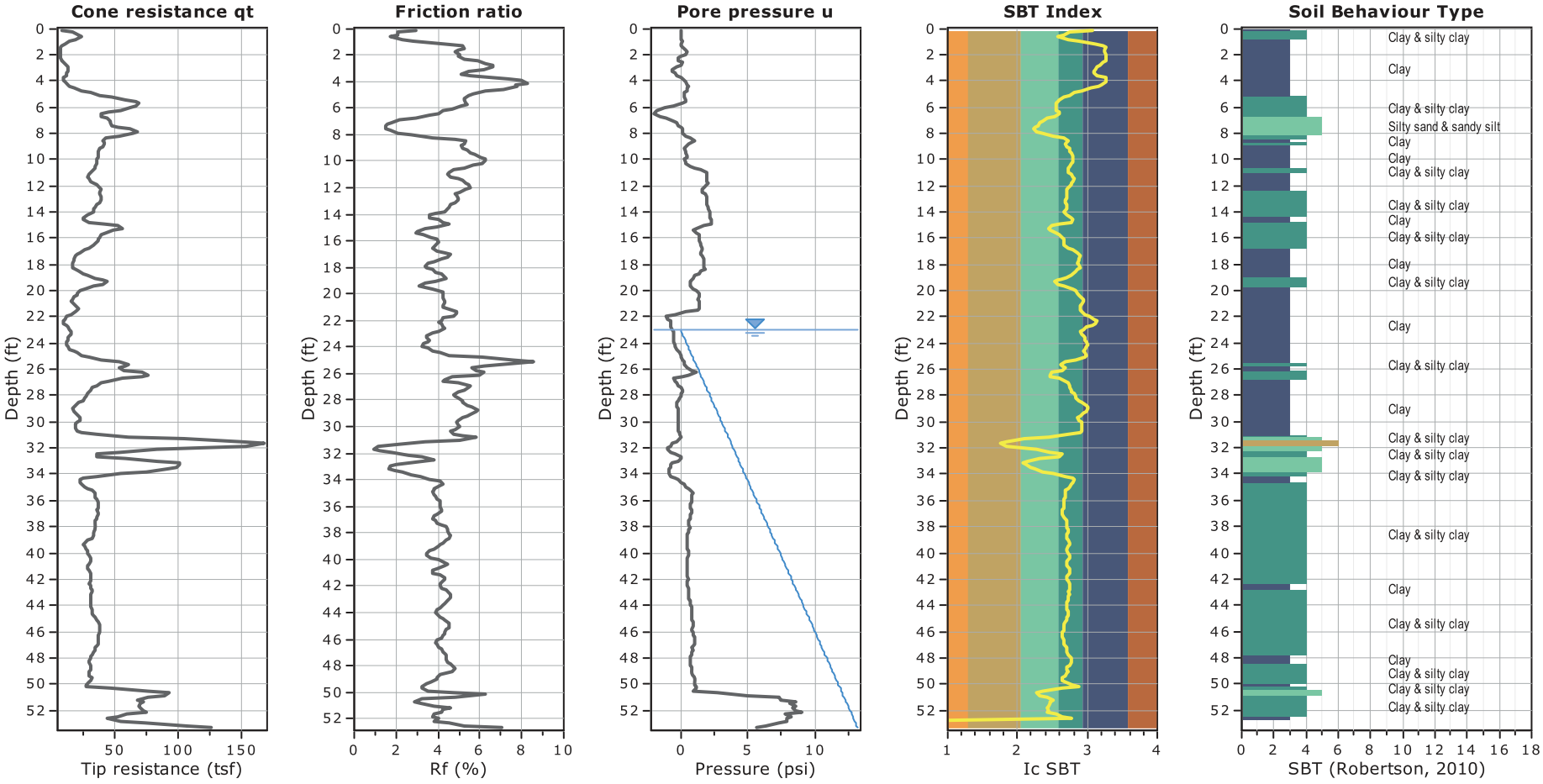
Total depth: 53.31 ft, Date: 4/1/2019
Estimated Depth to Groundwater: 23 feet
Cone Operator: Middle Earth Geo Testing, Inc.

VETERAN'S SQUARE
901 LOS MEDANOS STREET
Pittsburg, California

ROCKRIDGE GEOTECHNICAL

CONE PENETRATION TEST RESULTS
CPT-1

Date 05/15/19	Project No. 19-1661	Figure A-1



SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty clay
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to clayey sand
9. Very stiff fine grained

Total depth: 51.02 ft, Date: 4/1/2019
Depth to Groundwater: 23 feet (pore pressure dissipation test)
Cone Operator: Middle Earth Geo Testing, Inc.

VETERAN'S SQUARE
901 LOS MEDANOS STREET
Pittsburg, California

ROCKRIDGE GEOTECHNICAL

CONE PENETRATION TEST RESULTS
CPT-2

Date 05/15/19	Project No. 19-1661	Figure A-2

PROJECT: **VETERAN'S SQUARE**
901 LOS MEDANOS STREET
Pittsburg, California

Log of Boring B-1

Boring location: See Site Plan, Figure 2
Date started: 4/16/19 | Date finished: 4/16/19
Drilling method: Solid-Flight Auger
Hammer weight/drop: 140 lbs./30 inches | Hammer type: Rope & Cathead
Sampler: Sprague & Henwood (S&H)

Logged by: N. Collins
Drilled by: Benevent Building
Rig: Portable Hydraulic Unit

DEPTH (feet)	Sampler Type	Sample	Blows/ 6"	SPT N-Value[1]	LITHOLOGY	MATERIAL DESCRIPTION	Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft
							LABORATORY TEST DATA					
1	S&H		6	11	CL	CLAY with SAND (CL) brown, stiff, dry to moist, with gravel and rootlets LL = 39, PI = 22; see Appendix B FILL					14.7	104
2			6 10									
3	S&H		6	17	CL	CLAY with SAND (CL) yellow-brown, very stiff, moist						
4			10 14									
5	S&H		16	45	SC	CLAYEY SAND (SC) yellow-brown with white mottling, dense, dry						
6			28 36									
7	S&H		10	15		medium dense						
8			10 12			Particle Size Distribution; see Appendix B				36	11.6	100
9												
10	S&H		13	35	CL	CLAY with SAND (CL) yellow-brown, hard, moist, medium-grained sand						
11			21 29									
12					CL	CLAY (CL) yellow-brown, hard, moist						
13												
14												
15	S&H		12	15	SP-SM	SAND with SILT (SP-SM) yellow-brown, medium dense, moist, fine-grained						
16			10 12									
17	S&H		9	13	SP	SAND (SP) brown, medium dense, dry, trace fines						
18			7 12		SP-SM	SAND with SILT (SP-SM) yellow-brown, medium dense, dry to moist						
19												
20	S&H		10	16	CL	SILTY CLAY with SAND (CL) yellow-brown, very stiff, moist, fine-grained sand Particle Size Distribution; see Appendix B				85	29.5	92
21			10 13									
22												
23						▽ (4/16/2019; 12:40 PM)						
24												
25	S&H		8	18	CL	CLAY (CL) yellow-brown with gray intrusions, very stiff, wet, trace fine-grained sand						
26			11 14									
27												
28												
29												
30												

Boring terminated at a depth of 26.5 feet below ground surface.
Boring backfilled with cement grout.
Groundwater encountered at a depth of 23 feet during drilling.

[1] S&H blow counts for the last two increments were converted to SPT N-Values using a factor of 0.7, to account for sampler type and hammer energy.

ROCKRIDGE GEOTECHNICAL

Project No.: 19-1661
Figure: A-3

PROJECT: **VETERAN'S SQUARE**
901 LOS MEDANOS STREET
Pittsburg, California

Log of Boring B-2

Boring location: See Site Plan, Figure 2
Date started: 4/16/19 | Date finished: 4/16/19
Drilling method: Solid-Flight Auger
Hammer weight/drop: 140 lbs./30 inches | Hammer type: Rope & Cathead
Sampler: Sprague & Henwood (S&H), Standard Penetration Test (SPT)

Logged by: N. Collins
Drilled by: Benevent Building
Rig: Portable Hydraulic Unit

DEPTH (feet)	SAMPLES: Sampler Type	SAMPLES: Sample	SAMPLES: Blows/ 6"	SPT N-Value[1]	LITHOLOGY	MATERIAL DESCRIPTION	LABORATORY TEST DATA: Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft
1	S&H		4 4 5	6	CL	SANDY CLAY with GRAVEL (CL) dark brown, medium stiff, moist, trace gravel, rootlets, woodchips FILL						
3	S&H		6 10 18	20	CL	CLAY with SAND (CL) brown, very stiff, moist LL = 48, PI = 30; see Appendix B Particle Size Distribution; see Appendix B					18.5	110
5	SPT		14 23 29	62	CL	SANDY CLAY (CL) yellow-brown, hard, dry to moist						
7	SPT		8 9 12	25	SM	SILTY SAND (SM) yellow-brown, medium dense, dry to moist						
9	SPT		7 10 16	31	CL	CLAY (CL) yellow-brown, hard, moist						
15	S&H		9 10 14	17	CL	SANDY CLAY (CL) yellow-brown, very stiff, moist, fine-grained sand Particle Size Distribution; see Appendix B				54	13.6	99
20	S&H		11 14 16	21	CL	CLAY with SAND (CL) yellow-brown with black mottling, very stiff, moist LL = 46, PI = 29; see Appendix B Particle Size Distribution; see Appendix B ▽ (4/16/2019; 9:30 AM)				87	27.4	92
25	S&H		10 11 16	19	CL	SANDY CLAY (CL) yellow-brown, very stiff, wet						
30												

ROCKRIDGE GEOTECHNICAL

Project No.: 19-1661
Figure: A-4a

PROJECT: **VETERAN'S SQUARE**
901 LOS MEDANOS STREET
Pittsburg, California

Log of Boring B-2

DEPTH (feet)	SAMPLES: Sampler Type	SAMPLES: Sample	SAMPLES: Blows/ 6"	SAMPLES: SPT N-Value[1]	LITHOLOGY	MATERIAL DESCRIPTION	LABORATORY TEST DATA: Type of Strength Test	Confining Pressure Lbs/Sq Ft	Shear Strength Lbs/Sq Ft	Fines %	Natural Moisture Content, %	Dry Density Lbs/Cu Ft
31	S&H		7 10 14	17	CL	SANDY CLAY (CL) (continued)						
32	SPT		7 11 13	29	SP-SC	SAND with CLAY (SP-SC) yellow-brown, medium dense, wet						
33					CL	CLAY (CL) yellow-brown, very stiff, wet						
34												
35												
36												
37												
38												
39												
40												
41												
42												
43												
44												
45												
46												
47												
48												
49												
50												
51												
52												
53												
54												
55												
56												
57												
58												
59												
60												

Boring terminated at a depth of 33 feet below ground surface.
Boring backfilled with cement grout.
Groundwater encountered at a depth of 23 feet during drilling.

[1] S&H and SPT blow counts for the last two increments were converted to SPT N-Values using factors of 0.7 and 1.2, respectively, to account for sampler type and hammer energy.

ROCKRIDGE GEOTECHNICAL

Project No.: 19-1661
Figure: A-4b

UNIFIED SOIL CLASSIFICATION SYSTEM

Major Divisions		Symbols	Typical Names
Coarse-Grained Soils (more than half of soil > no. 200 sieve size)	Gravels (More than half of coarse fraction > no. 4 sieve size)	GW	Well-graded gravels or gravel-sand mixtures, little or no fines
		GP	Poorly-graded gravels or gravel-sand mixtures, little or no fines
		GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
	Sands (More than half of coarse fraction < no. 4 sieve size)	SW	Well-graded sands or gravelly sands, little or no fines
		SP	Poorly-graded sands or gravelly sands, little or no fines
		SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
Fine -Grained Soils (more than half of soil < no. 200 sieve size)	Silts and Clays LL = < 50	ML	Inorganic silts and clayey silts of low plasticity, sandy silts, gravelly silts
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, lean clays
		OL	Organic silts and organic silt-clays of low plasticity
	Silts and Clays LL = > 50	MH	Inorganic silts of high plasticity
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic silts and clays of high plasticity
Highly Organic Soils		PT	Peat and other highly organic soils

GRAIN SIZE CHART

Classification	Range of Grain Sizes	
	U.S. Standard Sieve Size	Grain Size in Millimeters
Boulders	Above 12"	Above 305
Cobbles	12" to 3"	305 to 76.2
Gravel coarse fine	3" to No. 4 3" to 3/4" 3/4" to No. 4	76.2 to 4.76 76.2 to 19.1 19.1 to 4.76
Sand coarse medium fine	No. 4 to No. 200 No. 4 to No. 10 No. 10 to No. 40 No. 40 to No. 200	4.76 to 0.075 4.76 to 2.00 2.00 to 0.420 0.420 to 0.075
Silt and Clay	Below No. 200	Below 0.075

Unstabilized groundwater level

Stabilized groundwater level

SAMPLE DESIGNATIONS/SYMBOLS

Sample taken with Sprague & Henwood split-barrel sampler with a 3.0-inch outside diameter and a 2.43-inch inside diameter. Darkened area indicates soil recovered

Classification sample taken with Standard Penetration Test sampler

Undisturbed sample taken with thin-walled tube

Disturbed sample

Sampling attempted with no recovery

Core sample

Analytical laboratory sample

Sample taken with Direct Push sampler

Sonic

SAMPLER TYPE

C	Core barrel
CA	California split-barrel sampler with 2.5-inch outside diameter and a 1.93-inch inside diameter
D&M	Dames & Moore piston sampler using 2.5-inch outside diameter, thin-walled tube
O	Osterberg piston sampler using 3.0-inch outside diameter, thin-walled Shelby tube
PT	Pitcher tube sampler using 3.0-inch outside diameter, thin-walled Shelby tube
S&H	Sprague & Henwood split-barrel sampler with a 3.0-inch outside diameter and a 2.43-inch inside diameter
SPT	Standard Penetration Test (SPT) split-barrel sampler with a 2.0-inch outside diameter and a 1.5-inch inside diameter
ST	Shelby Tube (3.0-inch outside diameter, thin-walled tube) advanced with hydraulic pressure

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ROCKRIDGE GEOTECHNICAL

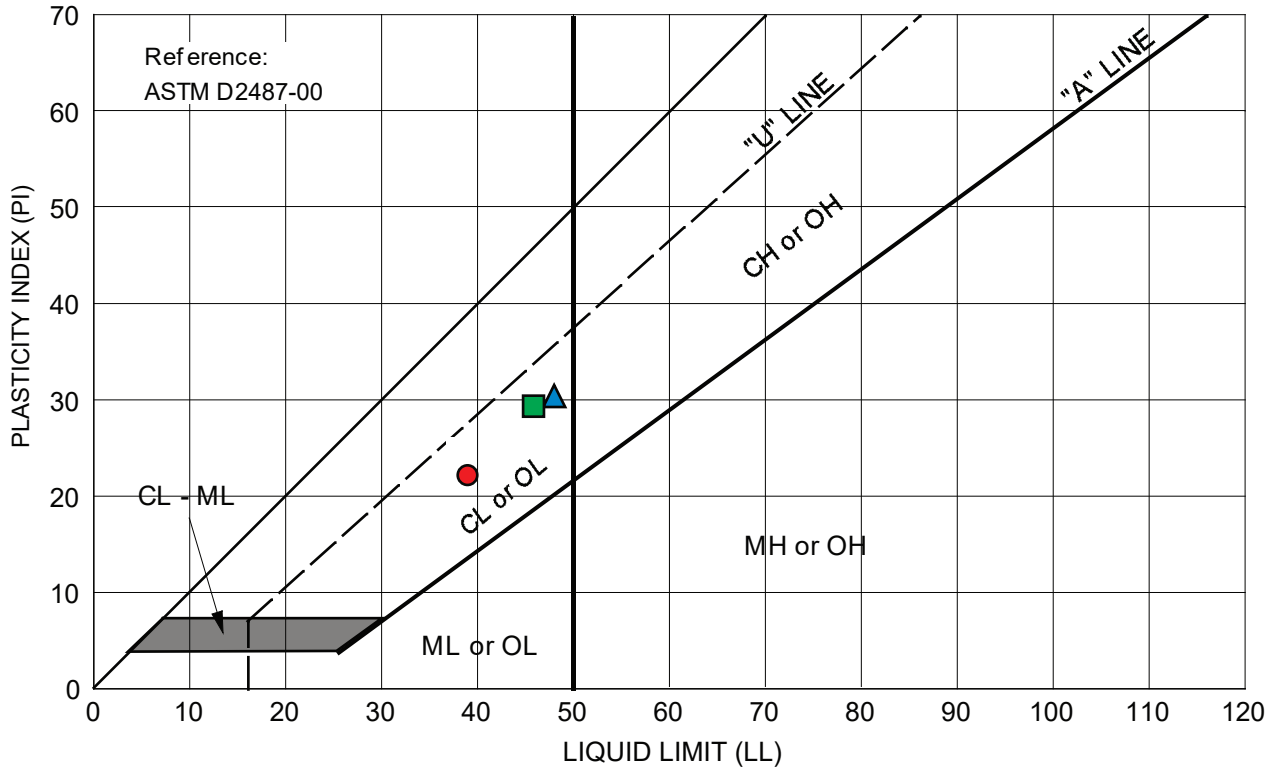
CLASSIFICATION CHART

Date 05/08/19 | Project No. 19-1661 | Figure A-5

ROCKRIDGE GEOTECHNICAL

APPENDIX B

Laboratory Test Results



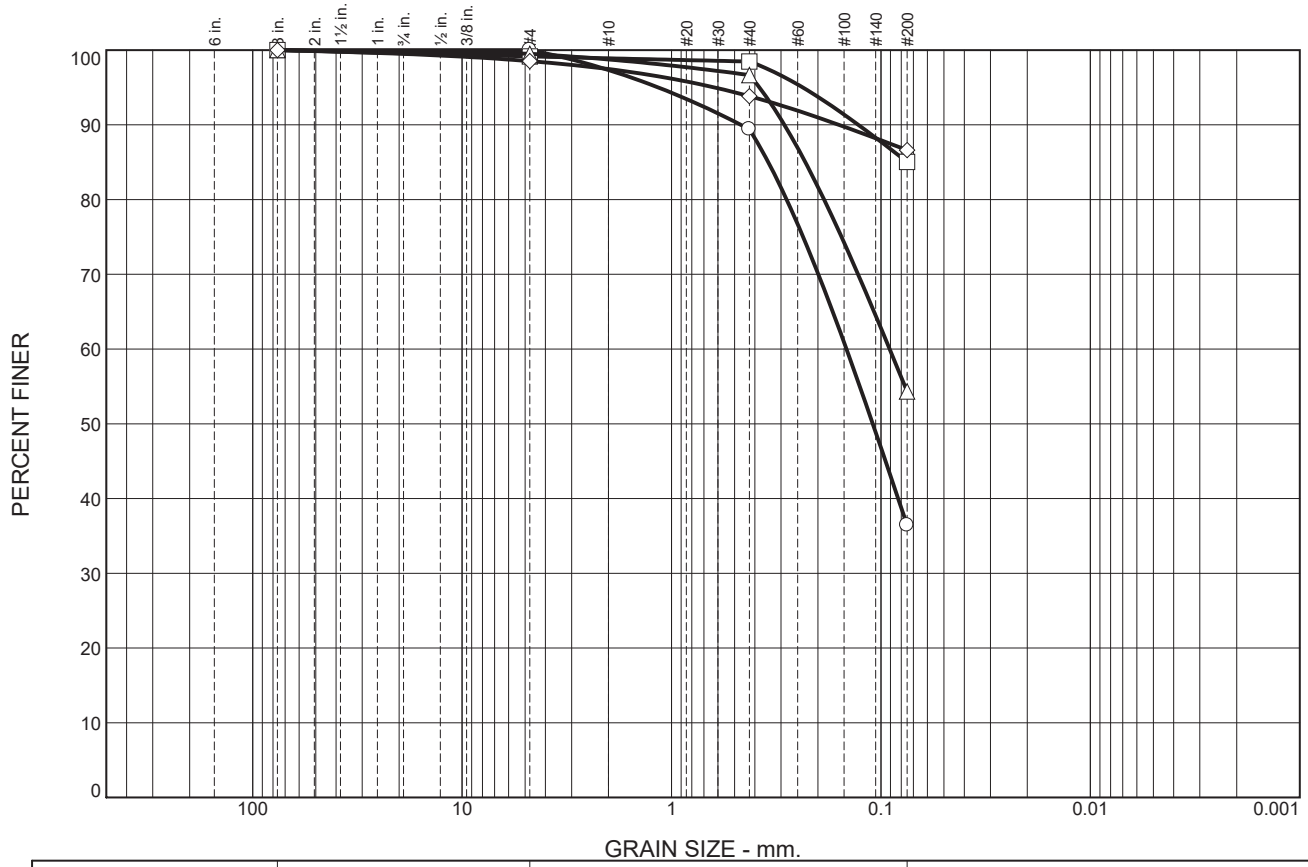
Symbol	Source	Description and Classification	Natural M.C. (%)	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
●	B-1 at 1.5 feet	CLAY with SAND (CL), brown	14.7	39	22	--
▲	B-2 at 3.5 feet	CLAY with SAND (CL), brown	18.5	48	30	--
■	B-2 at 20.5 feet	CLAY with SAND (CL), yellow-brown	27.4	46	29	87

VETERAN'S SQUARE
901 LOS MEDANOS STREET
Pittsburg, California

ROCKRIDGE GEOTECHNICAL

PLASTICITY CHART

Date 05/29/19 | Project No. 19-1661 | Figure B-1



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	0.0	0.0	2.7	7.9	53.0	36.4	
□	0.0	0.4	0.4	0.3	0.4	13.5	85.0	
△	0.0	0.2	0.3	0.8	2.0	42.4	54.3	
◇	0.0	0.5	1.0	1.0	3.7	7.2	86.6	

SOIL DATA

SYMBOL	SOURCE	DEPTH (ft.)	Material Description	USCS
○	B-1	8.0'	CLAYEY SAND yellow-brown	SC
□	B-1	20.5'	SILTY CLAY with SAND, yellow-brown	CL
△	B-2	15.5'	SANDY CLAY, yellow-brown	CL
◇	B-2	20.5'	CLAY with SAND, yellow-brown	CL

VETERAN'S SQUARE
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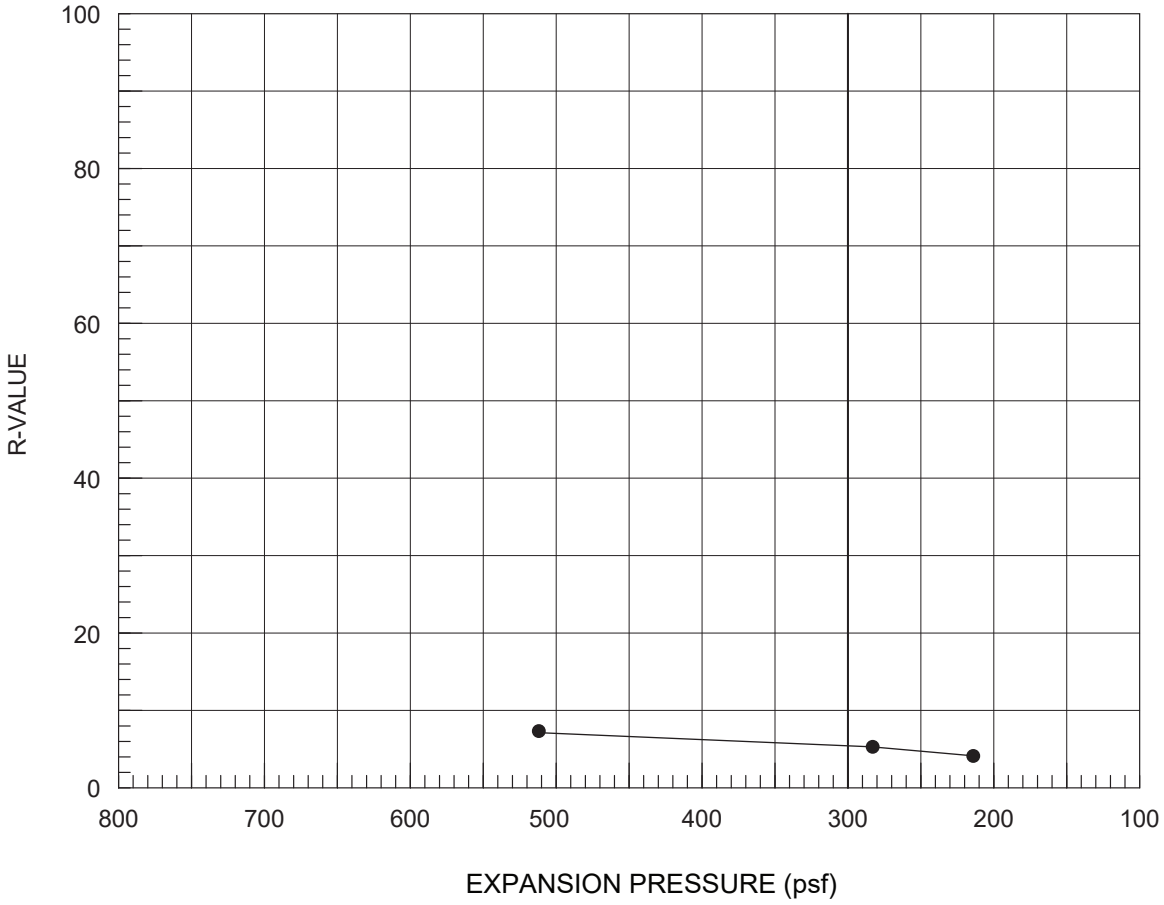
ROCKRIDGE GEOTECHNICAL

PARTICLE SIZE DISTRIBUTION REPORT

Date 05/29/19 | Project No. 19-1661 | Figure B-2



Resistance R-Value and Expansion Pressure - Cal Test 301

No.	Compact. Pressure psi	Density pcf	Moist. %	Expansion Pressure psi	Horizontal Press. psi @ 160 psi	Sample Height in.	Exud. Pressure psi	R Value	R Value Corr.
1	50	101	23.4	0.00	0.00	2.51	511	7	
2	54	100	24.4	0.00	0.00	2.52	284	5	
3	54	98	25.9	0.00	0.00	2.55	212	4	

Test Results	Material Description
R-Value at 300 psi exudation pressure = 5	CLAY (CL), gray-brown Sample Source: R-1 at 0-2 feet

VETERAN'S SQUARE
901 LOS MEDANOS STREET
Pittsburg, California

ROCKRIDGE GEOTECHNICAL

R-VALUE TEST REPORT

Date 09/24/15 | Project No. 19-1661 | Figure B-3

Results Only Soil Testing for 901 Los Medanos Street

May 10, 2019

Prepared for:
Katie Dickinson
Rockridge Geotechnical
270 Grand Ave,
Oakland, CA 94610
ksdickinson@rockridgegeo.com

Project X Job#: S190506D
Client Job or PO#: 19-1661

Soil Analysis Lab Results

Client: Rockridge Geotechnical
Job Name: 901 Los Medanos Street
Client Job Number: 19-1661
Project X Job Number: S190506D
May 10, 2019

	Method	ASTM G187		ASTM D516		ASTM D512B		SM 4500-NO3-E	SM 4500-NH3-C	SM 4500-S2-D	ASTM G200	ASTM G51
Bore# / Description	**Depth**	**Resistivity** As Rec'd	Minimum	**Sulfates**		**Chlorides**		**Nitrate**	**Ammonia**	**Sulfide**	**Redox**	**pH**
	(ft)	(Ohm-cm)	(Ohm-cm)	(mg/kg)	(wt%)	(mg/kg)	(wt%)	(mg/kg)	(mg/kg)	(mg/kg)	(mV)	
B-1-3	4.0	804	610	224	0.0224	8.3	0.0008	2.7	0.1	0.21	168	8.21
B-2-2	3.0	1,072	871	133	0.0133	4.1	0.0004	1.4	0.1	2.76	162	8.23

Unk = Unknown
NT = Not Tested
ND = 0 = Not Detected
mg/kg = milligrams per kilogram (parts per million) of dry soil weight
Chemical Analysis performed on 1:3 Soil-To-Water extract

Please call if you have any questions.

Prepared by,

Ernesto Padilla, BSME
Field Engineer

Respectfully Submitted,

Eddie Hernandez, M.Sc., P.E.
Sr. Corrosion Consultant
NACE Corrosion Technologist #16592
Professional Engineer
California No. M37102
ehernandez@projectxcorrosion.com

Project X
Corrosion Engineering
Corrosion Control - Soil, Water, and Metallurgy Lab

Lab Request Sheet Chain of Custody

Phone: (213) 928-7213 · Fax (951) 226-1720 · www.projectxcorrosion.com

Ship Samples To: 29990 Technology Dr, #13, Murrieta, CA 92563

Project X Job Number S190506D Rockridge 19-1661 Medanos 2 Pull

IMPORTANT: Please complete Project and Sample Identification Data as you would like it to appear in report & include this form with samples.

Company Name:	Rockridge Geotechnical, Inc.	**Contact Name:** Katie Dickinson	**Phone No. :** 510-504-4183
Mailing Address:	270 Grand Ave. Oakland, CA 94610	**Contact Email:**	ksdickinson@rockridgege.com
Accounting Contact:	Jarka Stepanek	**Invoice Email:**	invoices@rockridgegeo.com
Project Name:	901 Los Medanos Street	**Client Project No:**	19-1661

P.O. #:		**5 Day** Normal	**3 Day** RUSH 75% mark-up	**2 Day** RUSH 100% mark-up
Turn Around Time:		✔		

Results By: ☐ Phone ☐ Fax ☑ Email ☐ Mail ☐ Overnight Mail (charges apply)

Date & Received by : **Default Method**

SPECIAL INSTRUCTIONS:

	SAMPLE ID - BORE #	DESCRIPTION	DEPTH (ft)	DATE COLLECTED
1	B-1-3	Clay with SAND, yellow-brown	4	04/16/19
2	B-2-2	CLAY, brown	3	04/16/19
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				

ANALYSIS REQUESTED (Please circle)

Min. Resistivity, Sulfate, Chloride, Sulfide, Redox, pH, Alkalinity, Nitrate,	CORROSION SERIES	Soil Resistivity	pH	Sulfate	Chloride	Redox Potential	BiCarbonate	Alkalinity	Acidity	Nitrate	Ammonia	Sulfide	Moisture Content	Soil Corrosivity Evaluation Report	Metallurgical Analysis
	✓														
ASTM G187		ASTM G 51	ASTM D516	ASTM D512B	SM 2580B	SM 2320B	SM 2520B	SM 2510B	Hach 835	Hach 830	SM 4500-S2	ASTM D2216			
AASHTO T288		AASHTO T 289	AASHTO T 290	AASHTO T 291					SM 4500-NO3	SM 4500-NH3	SM 4500-S2				
Caltrans CTM64		Caltrans CTM64	Caltrans CTM41	Caltrans CTM42											

NOTES

ERR Memorandum- Veterans Square and Attachments-Bill

Final Audit Report 2021-08-25

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By:	Heather Klein (HKlein@oaklandca.gov)
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