Exhibit 3f Item 5-A
Planning Board Meeting
July 28, 2025

2433 MARINER SQUARE LOOP RESIDENTIAL DEVELOPMENT NOISE AND VIBRATION ASSESSMENT

Alameda, California

May 6, 2025

Prepared for:

Martin Mariner Square, LLC
1970 Broadway, Suite 745
Oakland, CA 94612

Prepared by:

Fred Svinth, INCE, Assoc. AIA

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality
429 East Cotati Avenue
Cotati, CA 94931
(707) 794-0400

I&R Job No.: 25-010

INTRODUCTION

The proposed project involves the demolition of four office building and the construction of a single eight (8) story residential building consisting of five (5) stories of residential use in Type IIIA construction over three (3) stories of mixed amenity, residential and parking uses in type IIIA construction on an approximately 2.34-acre site in Alameda, California. The project will include 356 for-rent apartment units and residential outdoor use areas at the podium level and selected rooftop areas. This report evaluates the project's potential to result in significant impacts with respect to applicable California Environmental Quality Act (CEQA) guidelines. The report is divided into two sections: the Setting Section provides a brief description of the fundamentals of environmental noise and groundborne vibration, summarizes applicable regulatory criteria, and discusses ambient noise conditions in the project vicinity; and the Impacts and Mitigation Measures Section describes the significance criteria used to evaluate project impacts, provides a discussion of each project impact, and presents mitigation measures, where necessary, to mitigate project impacts to a less-than-significant level.

SETTING

FUNDAMENTALS OF ENVIRONMENTAL NOISE

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its *pitch* or its *loudness*. *Pitch* is the height or depth of a tone or sound, depending on the relative rapidity (*frequency*) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. *Loudness* is the intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales which are used to describe noise in a particular location. A *decibel (dB)* is a unit of measurement which indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10 decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities. Technical terms are defined in Table 1.

There are several methods of characterizing sound. The most common in California is the *A-weighted sound level (dBA).* This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in Table 2. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This *energy-equivalent sound/noise descriptor* is called L_{eq}. The most common averaging period is hourly, but L_{eq} can describe any series of noise events of arbitrary duration.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

TABLE 1 Definition of Acoustical Terms Used in this Report

Term	Definition
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20 micro Pascals.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro Pascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e. g., 20 micro Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn} or DNL	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 pm and 7:00 am.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 pm to 10:00 pm and after addition of 10 decibels to sound levels measured in the night between 10:00 pm and 7:00 am.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Source: Handbook of Acoustical Measurements and Noise Control, Harris, 1998.

TABLE 2 Typical Noise Levels in the Environment

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110 dBA	Rock band
Jet fly-over at 1,000 feet		
	100 dBA	
Gas lawn mower at 3 feet		
	90 dBA	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	80 dBA	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	70 dBA	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	60 dBA	
		Large business office
Quiet urban daytime	50 dBA	Dishwasher in next room
Quiet urban nighttime	40 dBA	Theater, large conference room
Quiet suburban nighttime		
	30 dBA	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	20 dBA	
		Broadcast/recording studio
	10 dBA	
	0 dBA	

Source: Technical Noise Supplement (TeNS), California Department of Transportation, September 2013.

Since the sensitivity to noise increases during the evening and at night -- because excessive noise interferes with the ability to sleep -- 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The *Community Noise Equivalent Level* (*CNEL*) is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added to evening (7:00 p.m. to 10:00 p.m.) and a 10 dB addition to nocturnal (10:00 p.m. to 7:00 a.m.) noise levels. The *Day/Night Average Sound Level* (L_{dn} or *DNL*) is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

Effects of Noise

Sleep and Speech Interference

The thresholds for speech interference indoors are about 45 dBA if the noise is steady and above 55 dBA if the noise is fluctuating. Outdoors the thresholds are about 15 dBA higher. Steady noises of sufficient intensity (above 35 dBA) and fluctuating noise levels above about 45 dBA have been shown to affect sleep. Interior residential standards for multi-family dwellings are set by the State of California at 45 dBA L_{dn}. Typically, the highest steady traffic noise level during the daytime is about equal to the L_{dn} and nighttime levels are 10 dBA lower. The standard is designed for sleep and speech protection and most jurisdictions apply the same criterion for all residential uses. Typical structural attenuation is 12 to 17 dBA with open windows. With closed windows in good condition, the noise attenuation factor is around 20 dBA for an older structure and 25 dBA for a newer dwelling.[1] Sleep and speech interference is therefore possible when exterior noise levels are about 57 to 62 dBA L_{dn} with open windows and 65 to 70 dBA L_{dn} if the windows are closed.

Levels of 55 to 60 dBA are common along collector streets and secondary arterials, while 65 to 70 dBA is a typical value for a primary/major arterial. Levels of 75 to 80 dBA are normal noise levels at the first row of development outside a freeway right-of-way. In order to achieve an acceptable interior noise environment, bedrooms facing secondary roadways need to be able to have their windows closed, those facing major roadways and freeways typically need special glass windows.

Annoyance

Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that the causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The L_{dn} as a measure of noise has been found to provide a valid correlation between noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources. When measuring the percentage of the population highly annoyed, the threshold for ground vehicle noise is about 50 dBA L_{dn}. At a L_{dn} of about 60 dBA, approximately 12 percent of the population is highly annoyed. When the L_{dn} increases to 70 dBA, the percentage of the population highly annoyed increases to about 25 to 30 percent of the population. There is, therefore, an increase of about 2 percent per dBA between a L_{dn} of 60 to 70 dBA. Between a L_{dn} of 70 to 80 dBA, each decibel increase increases by about 3 percent the percentage of the population highly annoyed. People appear to respond more adversely to aircraft noise. When the L_{dn} is 60 dBA, approximately 30 to 35 percent of the population is believed to be highly annoyed. Each decibel increase to 70 dBA adds about 3 percentage points to the number of people highly annoyed. Above 70 dBA, each decibel increase results in about a 4 percent increase in the percentage of the population highly annoyed.[2]

FUNDAMENTALS OF GROUNDBORNE VIBRATION

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One method is the Peak Particle Velocity (PPV). The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. In this report, a PPV descriptor with units of mm/sec or in/sec

---

[1] Based on the U.S. Department of Transportation Federal Highway Administration document "Highway Traffic Noise: Analysis and Abatement Guidance" (2010) and data from Illingworth & Rodkin, Inc. noise monitoring projects.

[2] Kryter, Karl D. The Effects of Noise on Man. Menlo Park, Academic Press, Inc., 1985.

is used to evaluate construction generated vibration for building damage and human complaints. Table 3 below displays the reactions of people and the effects on buildings that continuous or frequent intermittent vibration levels produce. The guidelines in Table 3 represent syntheses of vibration criteria for human response and potential damage to buildings resulting from construction vibration.

Construction activities can cause vibration that varies in intensity depending on several factors. The use of pile driving and vibratory compaction equipment typically generates the highest construction related groundborne vibration levels. Because of the impulsive nature of such activities, the use of the PPV descriptor has been routinely used to measure and assess groundborne vibration and almost exclusively to assess the potential of vibration to cause damage and the degree of annoyance for humans.

TABLE 3 Reaction of People and Damage to Buildings from Continuous or Frequent Intermittent Vibration Levels

Velocity Level, PPV (in/sec)	Human Reaction	Effect on Buildings
0.01	Barely perceptible	No effect
0.04	Distinctly perceptible	Vibration unlikely to cause damage of any type to any structure
0.08	Distinctly perceptible to strongly perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
0.1	Strongly perceptible	Threshold at which there is a risk of damage to fragile buildings with no risk of damage to most buildings
0.25	Strongly perceptible to severe	Threshold at which there is a risk of damage to historic and some old buildings.
0.3	Strongly perceptible to severe	Threshold at which there is a risk of damage to older residential structures
0.5	Severe - Vibrations considered unpleasant	Threshold at which there is a risk of damage to new residential and modern commercial/industrial structures

Source: Transportation and Construction Vibration Guidance Manual, California Department of Transportation, April 2020.

The two primary concerns with construction-induced vibration, the potential to damage a structure and the potential to interfere with the enjoyment of life, are evaluated against different vibration limits. Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels, such as people in an urban environment, may tolerate a higher vibration level.

Structural damage can be classified as cosmetic only, such as paint flaking or minimal extension of cracks in building surfaces; minor, including limited surface cracking; or major which could threaten the structural integrity of the building. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher. The damage criteria presented in Table 3 include several categories for ancient, fragile, and historic structures, the types of structures most at risk to damage. Most buildings are included within the categories ranging from “Historic and some old buildings” to “Modern industrial/commercial buildings”. Construction-induced vibration that can be detrimental to the building is very rare and has only been observed in instances where the structure is at a high state of disrepair and the construction activity occurs immediately adjacent to the structure.

The annoyance levels shown in Table 3 should be interpreted with care since vibration may be found to be annoying at lower levels than those shown, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage.

REGULATORY BACKGROUND – NOISE

This section describes the relevant guidelines, policies, and standards established by Federal Agencies, State Agencies, Alameda County, and the City of Alameda. The State CEQA Guidelines, Appendix G, are used to assess the potential significance of impacts pursuant to local General Plan policies or the applicable standards of other agencies. A summary of the applicable regulatory criteria is provided below.

Federal Government

Federal Transit Administration. The Federal Transit Administration (FTA) has identified construction noise thresholds in the *Transit Noise and Vibration Impact Assessment Manual*,[3] which limit daytime construction noise to 80 dBA L_{eq} at residential land uses, to 85 dBA L_{eq} at commercial and office uses, and to 90 dBA L_{eq} at industrial land uses.

State of California

State CEQA Guidelines. The California Environmental Quality Act (CEQA) contains guidelines to evaluate the significance of effects of environmental noise attributable to a proposed project. Under CEQA, noise impacts would be considered significant if the project would result in:

(a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;

(b) Generation of excessive groundborne vibration or groundborne noise levels;

(c) For a project located within the vicinity of a private airstrip or an airport land use plan or where such a plan has not been adopted within two miles of a public airport or public use airport, if the project would expose people residing or working in the project area to excessive noise levels.

2022 California Building Code, Title 24, Part 2. Section 1206.4 of the current (2022) California Building Code (CBC) states that interior noise levels attributable to exterior sources shall not exceed 45 dB(A) L_{dn} or CNEL (consistent with the noise element of the local general plan) in any habitable room. Though this section does to not explicitly apply this interior limit to multifamily residential buildings, per the scope discussion in Section 1206.1 and in keeping with the requirements of prior editions of the CBC this limit is applied to any habitable room for new attached (e.g. multifamily) dwellings and not detached single-family dwellings.

[3] Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, FTA Report No. 0123, September 2018.

<u>City of Alameda</u>

City of Alameda General Plan 2040.

Chapter 6 of the City of Alameda General Plan 2040, which was amended in June 2022, includes policies and actions with the goal of maintaining an adequate noise environment in the City of Alameda. The following are applicable to this proposed project:

Objective 6. Protect Alameda residents from the harmful effects of exposure to excessive noise from aircraft, buses, boats, trucks and automobiles, and adjacent land uses.

Policy HS-56: **Interior Noise.** Support interior noise reduction strategies in all buildings, especially new or replacement residential construction, hotels, motels, and schools to ensure acceptable interior noise levels consistent with Figure 7.5 (Figure 1, following).

Policy HS-59: **Require Noise Reduction Strategies in All Construction Projects.** Require a vibration impact assessment for proposed projects in which heavy-duty construction equipment would be used (e.g. pile driving, bulldozing) within 200 feet of an existing structure or sensitive receptor. If applicable, the City shall require all feasible mitigation measures to be implemented to ensure that no damage to structures will occur and disturbance to sensitive receptors will be minimized.

Policy HS-60: **Significant CEQA Impacts.** In making a determination of impact under the California Environmental Quality Act (CEQA), consider the following impacts to be "significant" if the proposed project causes: an increase in the day-night average sound level (L_{dn}) of 4 or more dBA if the resulting noise level would exceed that described as normally acceptable for the affected land use, as indicated by State guidelines, or any increase in L_{dn} of 6 dBA or more.

City of Alameda Municipal Code.

Chapter IV of the City's Municipal Code includes noise control regulations, and the following apply to the proposed project:

Chapter 4-10.4 – Exterior Noise Standards

b. Exterior noise levels when measured at any receiving single or multiple family residential, school, hospital, church, public library or commercial property situated in the City do not conform to the provisions of this subsection when they exceed the noise level standards set forth in Table I or Table II (Tables 4 and 5, respectively, in this report) following:

TABLE 4 Receiving Land Use Noise Level Standards, dB(A) – Single or Multiple Family Residential, School, Hospital, Church, or Public Library Properties

Category	Cumulative Number of Minutes in Any One (1) Hour Time Period	Daytime (7:00 a.m. to 10:00 p.m.)	Nighttime (10:00 p.m. to 7:00 a.m.)
1[a]	30	55	50
2	15	60	55
3	5	65	60
4	1	70	65
5	0	75	70

[a] For example, this means the measured noise level may not exceed fifty-five (55) dB(A) for more than thirty (30) minutes out of any one (1) hour time period.

TABLE 5 Receiving Land Use Noise Level Standards, dB(A) – Commercial Properties

Category	Cumulative Number of Minutes in Any One (1) Hour Time Period	Daytime (7:00 a.m. to 10:00 p.m.)	Nighttime (10:00 p.m. to 7:00 a.m.)
1[a]	30	65	60
2	15	70	65
3	5	75	70
4	1	80	75
5	0	85	80

c. In the event the measured ambient noise level exceeds the applicable noise level standard in any category above, the applicable standards shall be adjusted so as to equal said ambient noise level.

d. Each of the noise level standards specified above shall be reduced by five (5) dB(A) for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises.

Chapter 4-10.5 – Prohibited Acts

b. *Specific Provisions.* The following acts, and the causing or permitting thereof, are a violation of this section:

7. Loading and Unloading. Loading, unloading, opening, closing or other handling of boxes, crates, containers, building materials, garbage cans, or similar objects between the hours of 10:00 p.m. and 7:00 a.m. in such a manner as to cause a noise disturbance across a residential real property line. This action shall not apply to such activities where the items handled are still in interstate commerce.

8. Vibration. Operating or permitting the operation of any device that creates a vibration which is above the vibration perception threshold of an individual at or beyond the property boundary of the source if on private property or at one hundred fifty (150′) feet (forty-six [46] meters) from the source if on a public space or public right-of-way.

10. Construction. Construction other than during the following hours: 7:00 a.m. to 7:00 p.m. Monday through Fridays and 8:00 a.m. to 5:00 p.m. on Saturdays.

Chapter 4-10.7 – Special Provisions (Exceptions)

e. *Construction*. The provisions of this section shall not apply to noise sources associated with construction provided the activities take place between the hours of 7:00 a.m. to 7:00 p.m. Monday through Fridays or 8:00 a.m. to 5:00 p.m. on Saturdays.

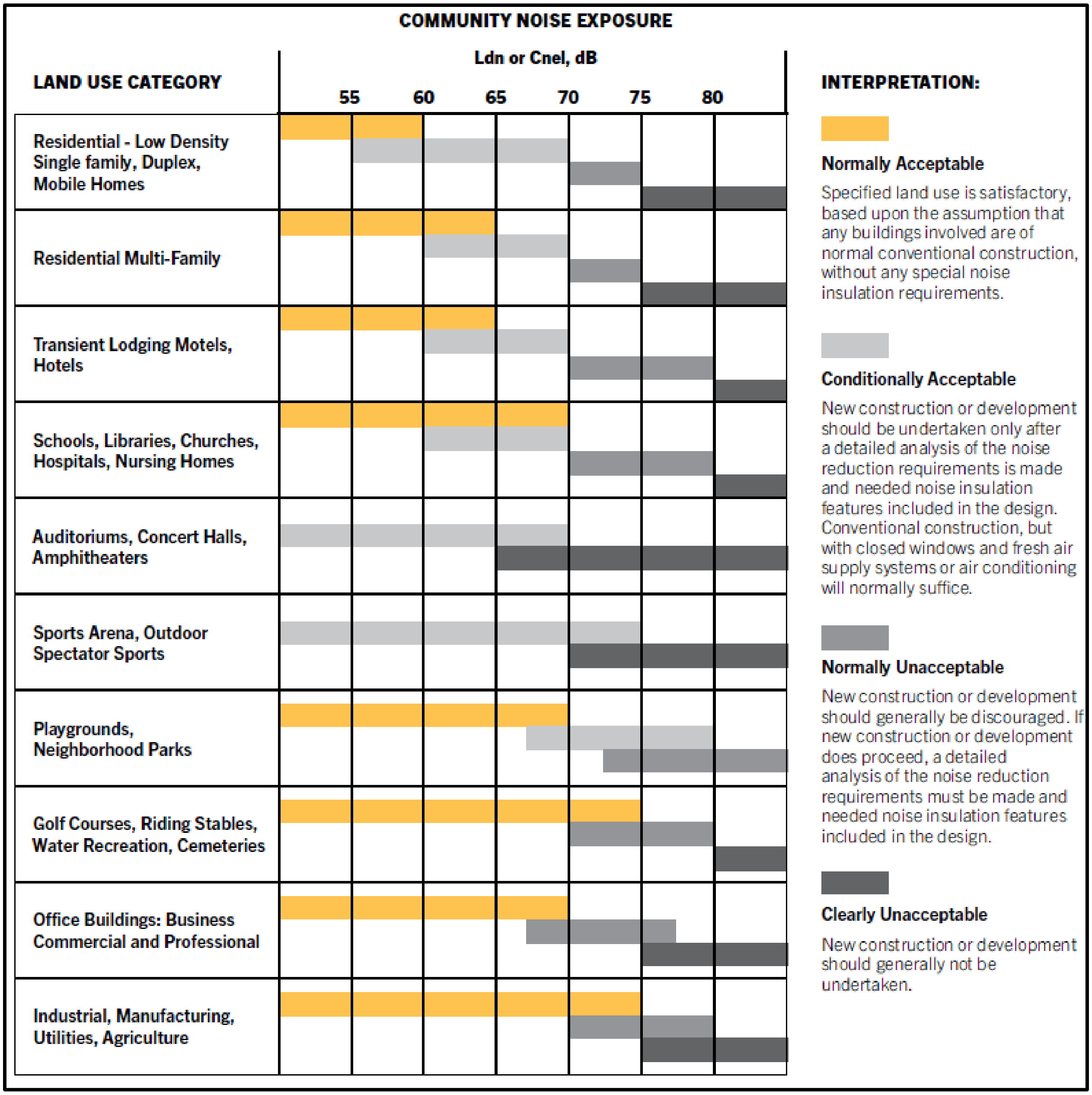


FIGURE 1: City of Alameda Noise and Land-Use Compatibility Guidelines Figure 7.5

EXISTING NOISE ENVIRONMENT

The proposed project is located northwest of the intersection of Mariner Square Loop and Mariner Square Drive above the Webster and Posey Street Tubes which connects Oakland and the Alameda Island in the City of Alameda. The site is bound by a parking lot to the west and northwest (which is bordered to the west by multi-family residential uses), storage and industrial uses to the east, multi-family senior living uses opposite Mariner Square Drive to the north/northwest (Cardinal Point) and north/northeast (Oakmont of Mariner Point) and office/commercial uses to the south opposite Mariner Square Loop. The noise environment at the site and in the surrounding area results primarily from traffic on these and other, more distant surrounding roadways. Aircraft associated with Oakland International Airport also contributes to the background noise environment. Noise from traffic entering and exiting the Webster Street and Posey Tubes (State Route 260) is significantly reduced at the project site due to the noise shielding from the grade changes and distances to these tunnel entrances.

A noise monitoring survey consisting of two long-term (LT-1 and LT-2) and three short-term (ST-1 through ST-3) noise measurements was conducted on the site and surrounding areas between 10 am on Tuesday February 25th, 2025, and 10 am on Thursday February 27th, 2025 to quantify the existing noise environment on and around the project site. All measurement locations are shown in Figure 2. The noise measurements were conducted with Larson Davis Laboratories (LDL) Type I Model LXT Sound Level Meters. All meters were equipped with ½-inch pre-polarized condenser microphones and windscreens and were calibrated with a Larson Davis Model CA250 precision acoustic calibrator prior to and following the measurement survey.

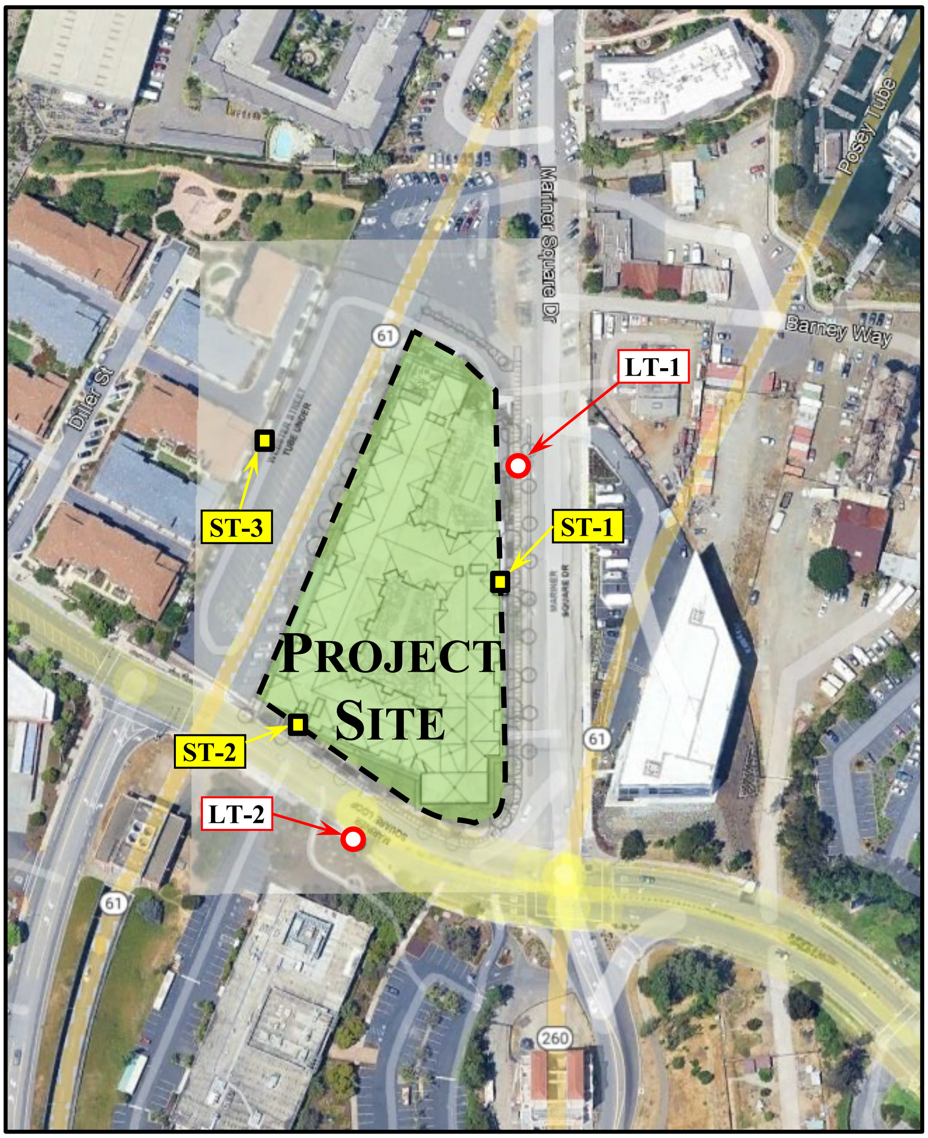
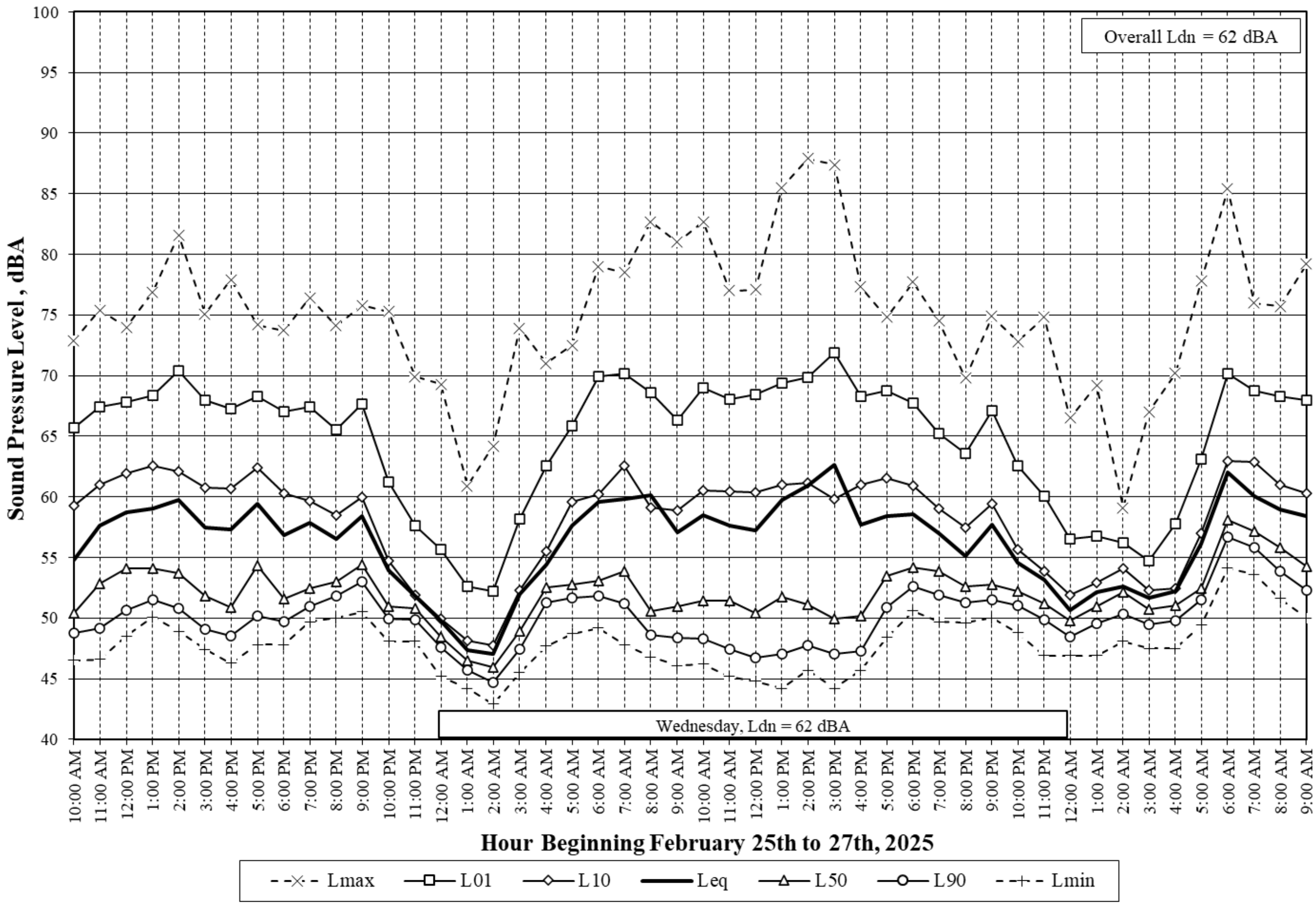


FIGURE 2: Project Site, Vicinity and Measurement Locations

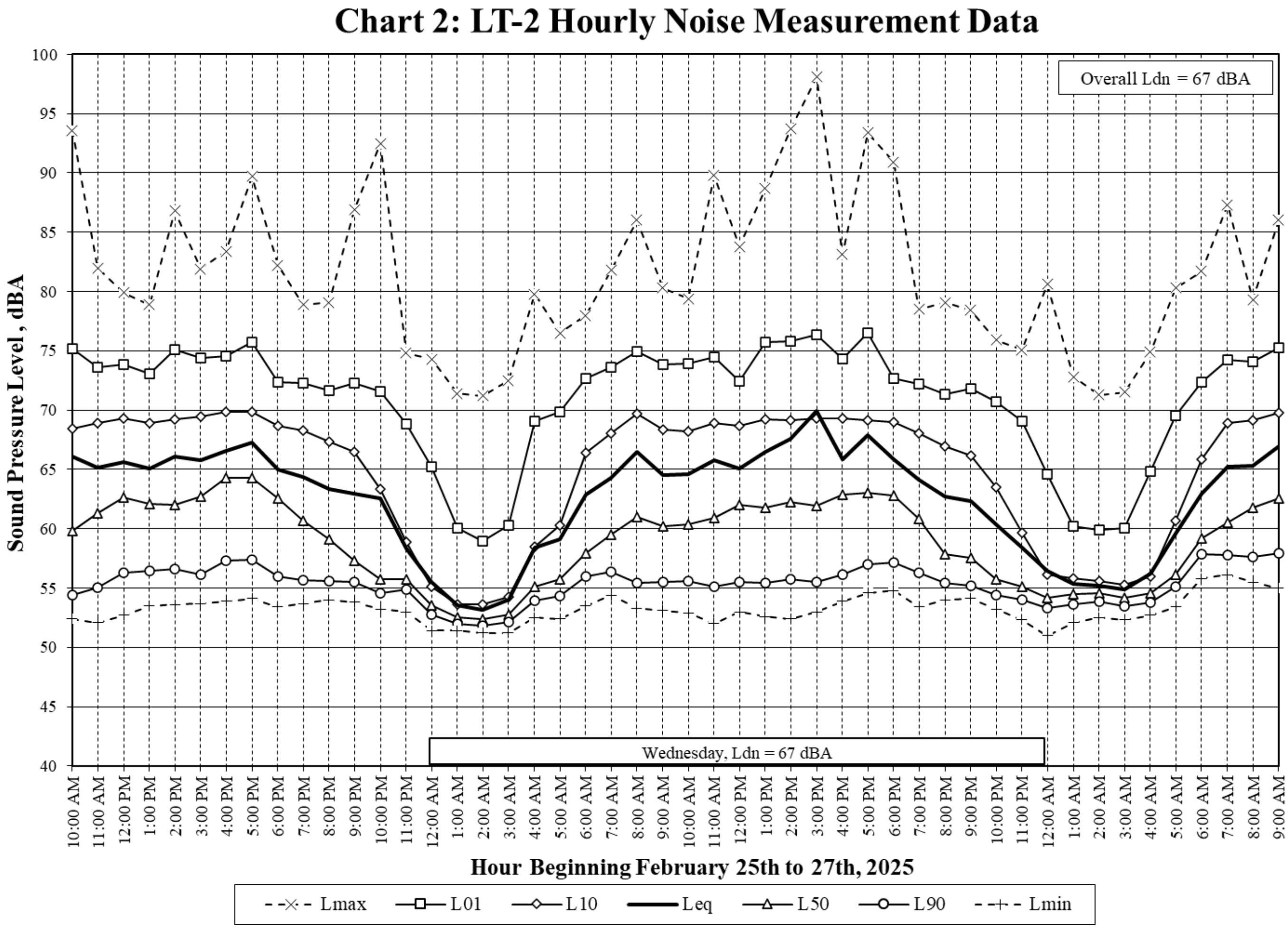
Long-term noise measurement LT-1 was made on a light standard located on the northern Mariner Square Drive site frontage at approximately 45 feet from the roadway centerline. The measured noise levels at this location, including the energy equivalent noise level (L_{eq}), maximum (L_{max}), minimum (L_{min}), and the noise levels exceeded 10, 50 and 90 percent of the time (indicated as L_{10}, L_{50} and L_{90}) are shown on Chart 1, following.

Chart 1: LT-1 Hourly Noise Measurement Data



A review of Chart 1 indicates that the noise levels at site LT-1 followed a diurnal pattern characteristic of traffic noise, with the nighttime noise levels reduced below daytime levels due to lower traffic activities. During the 46-hour noise measurement period, the average daytime noise levels ranged from 54 to 63 dBA L_{eq} and the average hourly nighttime noise levels ranged from 47 to 62 dBA L_{eq}. The overall average Day/Night noise Level (L_{dn}) for the monitoring period at position LT-1 was 62 dBA, with the full day [Wednesday(2/25)] L_{dn} level at 62 dBA

Long-term noise measurement, LT-2 was made in the upper branches of a tree on the south side of Mariner Square Loop at a height of 12 feet above grade and approximately 25 feet from the centerline of the roadway. The measured noise levels at this location, including the energy equivalent noise level (L_{eq}), maximum (L_{max}), minimum (L_{min}), and the noise levels exceeded 10, 50 and 90 percent of the time (indicated as L_{10}, L_{50} and L_{90}) are shown on Chart 2, following.



A review of Chart 2 indicates that the noise levels at site LT-2 also followed a diurnal pattern characteristic of traffic noise, with the nighttime noise levels reduced below daytime levels due to lower traffic activities. During the 46-hour noise measurement period, the average daytime noise levels ranged from 62 to 70 dBA L_{eq} and the average hourly nighttime noise levels ranged from 53 to 63 dBA L_{eq}. The overall average Day/Night noise Level (L_{dn}) for the monitoring period at position LT-1 was 67 dBA, with the full day [Wednesday(2/25)] L_{dn} level at 67 dBA

Short-term, 10-minute, duration noise measurements were made concurrently with the long-term measurements at long term positions LT-1 and LT-2 at five locations on February 25th, 2025, between 10:20 and 10:10 am as follows;

- The first short term measurement (ST-1 as shown in Figure 1) was made at 60 feet from the centerline of Mariner Square Drive at the setback of the proposed building along this roadway to evaluate the noise exposure at future residential facades closest to this roadway,
- The second short term measurement (ST-2 as shown in Figure 1) was made at 40 feet from the centerline of Mariner Square Loop at the setback of the proposed building along this roadway to evaluate the noise exposure at future residential facades closest to this roadway, and
- The third short term measurement (ST-3 as shown in Figure 1) was made at the edge of the parking lot adjacent to the property lines of the existing residential uses west of the project site.

This measurement was made at a position approximately equidistant from the adjacent roadways (~290 feet from the centerline of Mariner Square Loop, & ~300 feet from the centerline of Mariner Square Drive) to evaluate the expected minimum noise exposure at these residential uses.

The existing L_{dn} at each of these short-term locations was estimated by correlating the short-term measurement data to the data gathered during the corresponding time period at positions LT-1 and LT-2. These measurement results and estimated L_{dn} levels are shown in Table 6.

TABLE 6 Summary of Short-Term Noise Measurement Data (dBA)

Noise Measurement Location	L_{max}	$L_{(1)}$	$L_{(10)}$	$L_{(50)}$	$L_{(90)}$	L_{eq}	L_{dn}
ST-1: Mariner Square Loop roadway frontages: [2/25/2025 10:20 am to 10:30 am]	64	63	57	54	50	49	61
ST-2: Mariner Square Drive roadway frontages: [2/25/2025 10:40 am to 10:50 am]	71	68	65	61	58	53	66
ST-3: Property line Existing residential: [2/25/2025 11:00 am to 11:10 am]	61	58	52	50	49	47	61

IMPACTS AND MITIGATION MEASURES

This section describes the significance criteria used to evaluate project impacts under CEQA and provides a discussion of each project impact.

The following criteria were used to evaluate the significance of environmental noise resulting from the project:

(a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;

(b) Generation of excessive groundborne vibration or groundborne noise levels;

(c) For a project located within the vicinity of a private airstrip or an airport land use plan or where such a plan has not been adopted within two miles of a public airport or public use airport, if the project would expose people residing or working in the project area to excessive noise levels.

Impact 1a: **Temporary Construction Noise.** Noise-sensitive land uses surrounding the project site would be exposed to a temporary increase in ambient noise levels for a period exceeding one year. However, temporary construction noise levels are not expected to exceed FTA thresholds at the property lines of the nearest surrounding noise-sensitive land uses. With the incorporation of construction best management practices, the impact would be reduced to a **less-than-significant** level.

The project's construction is anticipated to occur from January 2026 through July 2027 with a total construction period of about 19 months. Construction phases would include demolition, site preparation, grading, trenching, building construction, architectural coating, and paving. During each phase of construction, there would be a different mix of equipment operating, and noise levels would vary by phase and vary within phases, based on the amount of equipment in operation and the location at which the equipment is operating.

Noise impacts resulting from construction depend upon the noise generated by various pieces of construction equipment, the timing and duration of noise-generating activities, and the distance between construction noise sources and noise-sensitive areas. Construction noise impacts primarily result when construction activities occur during noise-sensitive times of the day (e.g., early morning, evening, or nighttime hours), the construction occurs in areas immediately adjoining noise-sensitive land uses, or when construction lasts over extended periods of time.

Chapter 4-10.5 of the City's Municipal Code limits construction work hours to between 7:00 a.m. and 7:00 p.m. Monday through Fridays and 8:00 a.m. to 5:00 p.m. on Saturdays.

While the City of Alameda does not establish noise level thresholds for construction activities, this analysis uses the noise limits established by the Federal Transit Administration (FTA) to identify the potential for impacts due to substantial temporary construction noise. The FTA identifies construction noise limits in the Transit Noise and Vibration Impact Assessment Manual. During daytime hours, an exterior threshold of 80 dBA L_{eq} shall be applied at residential land uses, 85 dBA L_{eq} shall be applied at commercial, and office uses, and 90 dBA L_{eq} shall be applied at industrial land uses.

Construction activities are typically carried out in stages. During each stage of construction, there would be a different mix of equipment operating. Construction noise levels would vary by stage and vary within stages based on the amount of equipment in operation and location where the equipment is operating. Typical noise levels during the construction of apartments at 50 feet are shown in Table 7, which gives the average noise level ranges by construction phase. Hourly average noise levels generated by construction are typically about 72 to 89 dBA L_{eq} for multistory residential and parking garage erection as measured at a distance of 50 feet from the center of a busy construction site. Construction-generated noise levels drop off at a rate of about 6 dBA per doubling of the distance between the source and receptor. Shielding by buildings or terrain often results in lower construction noise levels at distant receptors.

TABLE 7 Typical Ranges of Construction Noise Levels at 50 Feet, L_{eq} (dBA)

Construction Stage	Domestic Housing		Office Building, Apartment, Hotel, Hospital, Public Works		Parking Garage, Religious, Amusement & Recreation, Store		Public Works Roads & Highways, Sewers, and Trenches	
	I	II	I	II	I	II	I	II
Ground Clearing	83	83	84	84	84	83	84	84
Excavation	88	75	89	79	89	71	88	78
Foundations	81	81	78	78	77	77	88	88
Erection	81	65	87	75	84	72	79	78
Finishing	88	72	89	75	89	74	84	84
I - All pertinent equipment present at site. **II** - Minimum required equipment present at site.								

Source: U.S.E.P.A., Legal Compilation on Noise, Vol. 1, p. 2-104, 1973.

The nearest noise sensitive (residential) uses to project construction are the multi-family residential uses to the opposite a parking lot to the west and the multi-family senior living uses opposite Mariner Square Drive to the north/northwest (Cardinal Point) and north/northeast (Oakmont of Mariner Point). The closest residences to the west will be about 120 feet from the perimeter of construction and about 230 feet from the center of the project site, the senior living residences to the north/northwest (Cardinal Point) will be as close as about 220 feet from the perimeter of construction and about 470 feet from the center of the project site, and the senior living residences to the north/northeast (Oakmont of Mariner Point) will be as close as about 300 feet from the perimeter of construction and about 530 feet from the center of the project site. Considering that construction noise levels would attenuate at a rate of about 4.5 to 6 dBA per doubling of distance the expected average construction noise levels with distance would be expected to range from:

Residences to the West

- 64 to 81 dBA with an average level of 73 dBA at 120 feet, and
- 59 to 76 dBA with an average level of 67 dBA at 230 feet.

Residences to the North/Northwest (Cardinal Point)

- 59 to 76 dBA with an average level of 68 dBA at 220 feet, and
- 53 to 70 dBA with an average level of 61 dBA at 470 feet.

Residences to the North/Northeast (Oakmont of Mariner Point)

- 56 to 73 dBA with an average level of 65 dBA at 300 feet, and
- 51 to 68 dBA with an average level of 60 dBA at 530 feet.

Though the project construction is expected to take more than one building season to complete, the average noise levels produced by this work would be below the exterior threshold of 80 dBA L_{eq} for residential uses as identified by the Transit Noise and Vibration Impact Assessment Manual. Additionally, the following commonly adopted best practice controls along with the allowable hours of construction from Section 4-10.7 of the Municipal Code are assumed to be included in the project:

- Equip all internal combustion engine-driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.
- Prohibit unnecessary idling of internal combustion engines.
- Locate stationary noise-generating equipment such as air compressors or portable power generators as far as possible from sensitive receptors. Construct temporary noise barriers to screen stationary noise-generating equipment when located near adjoining sensitive land uses.
- Utilize "quiet" air compressors and other stationary noise sources where technology exists.
- Control noise from construction workers' radios to a point where they are not audible at existing residences bordering the project site.
- Notify all adjacent business, residences, and other noise-sensitive land uses of the construction schedule, in writing, and provide a written schedule of "noisy" construction activities to the adjacent land uses and nearby residences.
- Designate a "disturbance coordinator" who shall be responsible for responding to any complaints about construction noise. The disturbance coordinator shall determine the cause of the noise complaint (e.g., bad muffler, etc.) and shall require that reasonable measures be implemented to correct the problem. Conspicuously post a telephone number for the disturbance coordinator at the construction site and include it in the notice sent to neighbors regarding the construction schedule.

With the implementation of the above best management practices, construction noise levels would be reduced as much as possible at the surrounding receptors minimizing disruption and annoyance. Since the FTA thresholds are not expected to be exceeded during project construction, and with the understanding that construction activities would occur for a limited period of time, the temporary construction noise impact would be less-than-significant.

Mitigation Measure 1a: None required.

Impact 1b: Permanent Noise Level Increase/Exceed Applicable Standards. Noise due to the use and occupation of the project residential uses on adjacent noise sensitive uses is not expected to significantly increase or alter the existing noise environment at these uses. **This is a less-than-significant impact.**

Project Operations

The proposed project would place new residential uses within about 120 feet of the existing multifamily residences to the west and within about 220 feet of the existing multifamily residences to the north. The occupation and use of the proposed residential uses is expected to result in the typical noises associated with residential developments, including voices of the new residents, residential maintenance activities, on-site parking lot activities, barking dogs and children. The Heating Ventilation and Air Conditioning (HVAC) and other mechanical equipment associated with the residential development will also add noise to the existing environment.

A review of project information indicates that all HVAC equipment for the project will be installed on the rooftop of the building. Based on noise measurements made at similar projects, individual outdoor condensing units at the proposed residences may produce constant sound pressure levels of 60 to 65 dBA L_{eq} at 1 meter (3.3 feet) and under worst-case conditions with all units operating the sound levels at the roof edge could reach 60 to 65 dBA L_{eq}. Considering this noise level and that a rooftop parapet wall and building structure itself would provide a minimum of 10 decibels of noise reduction, and the distances to the adjacent residential uses, noise from rooftop HVAC equipment is expected to be below ambient noise levels at the adjacent residences and not exceed the Municipal Code noise limits at any surrounding use.

Project Traffic

The traffic study included peak hour turning movements for existing and existing plus project traffic volumes at the Mariner Square Drive/Mariner Square Loop/Marina Village and the Mariner Square Loop/Mitchell Avenue intersections at which project traffic will begin to contribute to the area roadways. By comparing the existing plus project traffic scenario to the existing scenario, the project's contribution to noise level increases at these intersections were found to be between 1 to 2 dBA Mariner Square Loop, 1 dBA or less on Mariner Square Drive and Mitchel Avenue, and 1 dBA on Mariner Village Parkway. Therefore, the project would not result in a measurable or detectable permanent noise increase at noise-sensitive receptors in the project vicinity.

Based on the above conclusions, it is found that on-site project operations would not result in an increase noise levels in any surrounding areas by 4 dBA or more as required by the General Plan. Thus, project operational noise impacts would be less-than-significant.

Mitigation Measure 1b: None required.

Impact 2: **Exposure to Excessive Groundborne Vibration.** Construction-related vibration levels would not exceed applicable vibration thresholds at nearby sensitive land uses. This is a **less-than-significant** impact.

The construction of the project may generate perceptible vibration when heavy equipment or impact tools (e.g., jackhammers, hoe rams) are used. Construction activities would include demolition, site preparation work, foundation work, and new building framing and finishing. Pile driving equipment, which can cause excessive vibration, is not expected to be required for the proposed project.

The California Department of Transportation (Caltrans) recommends a vibration limit of 0.5 in/sec PPV for buildings structurally sound and designed to modern engineering standards, which typically consist of buildings constructed since the 1990s. Conservative vibration limits of 0.3 in/sec PPV have been used for buildings that are found to be structurally sound but where structural damage is a major concern (see Table 3 above for further explanation). For historical buildings and some old buildings, a vibration limit of 0.25 in/sec PPV would apply, and for ruins or ancient monuments, a cautious vibration limit of 0.08 in/sec PPV is often used to provide the highest level of protection. No historical buildings, ancient monuments or ruins have been identified within 200 feet of the project. Conservatively, the 0.3 in/sec PPV threshold would be applied for all structures in the project vicinity.

Table 8 presents typical vibration levels that could be expected from construction equipment at a distance of 25 feet. Project construction activities, such as drilling, the use of jackhammers, rock drills and other high-power or vibratory tools, and rolling stock equipment (tracked vehicles, compactors, etc.), may generate substantial vibration in the immediate vicinity. Jackhammers typically generate vibration levels of 0.035 in/sec PPV, and drilling typically generates vibration levels of 0.09 in/sec PPV at a distance of 25 feet.

Vibration levels would vary depending on soil conditions, construction methods, and equipment used. Table 8 also summarizes the distances to the 0.3 in/sec PPV threshold for older conventional buildings located in the project vicinity.

TABLE 8 Vibration Source Levels for Construction Equipment

Equipment		PPV at 25 ft. (in/sec)	Minimum Distance to Meet 0.3 in/sec PPV (feet)
Clam shovel drop		0.202	18
Hydromill (slurry wall)	in soil	0.008	1
	in rock	0.017	2
Vibratory Roller		0.210	19
Hoe Ram		0.089	9
Large bulldozer		0.089	9
Caisson drilling		0.089	9
Loaded trucks		0.076	8
Jackhammer		0.035	4
Small bulldozer		0.003	<1

Source: Transit Noise and Vibration Impact Assessment Manual, Federal Transit Administration, Office of Planning and Environment, U.S. Department of Transportation, September 2018, as modified by Illingworth & Rodkin, Inc., January 2025.

Vibration levels are highest close to the source and then attenuate with increasing distance at the rate $\left({D_{ref}}/{D}\right)^{1.1}$, where D is the distance from the source in feet and D_{ref} is the reference distance of 25 feet. While construction noise levels increase based on the cumulative equipment in use simultaneously, construction vibration levels would be dependent on the location of individual pieces of equipment. That is, equipment scattered throughout the site would not generate a collective vibration level, but a vibratory roller, for instance, operating near the project site boundary would generate the worst-case vibration levels for the receptor sharing that property line. Further, construction vibration impacts are assessed based on damage to buildings on receiving land uses, not receptors at the nearest property lines.

The nearest off-site building would be the multifamily residential building approximately 120 feet to the west opposite the parking area above the Webster Street Tube. When construction equipment is used along the western site boundary vibration levels would be 0.02 in/sec PPV or less. All other buildings in the project vicinity would be more distant from the project site and would be exposed to lower construction vibration levels. Therefore, vibration due to construction activities at the project site would be well below the 0.3 in/sec PPV threshold for conventional buildings. This would be a less-than-significant impact.

Neither cosmetic, minor, or major damage would occur at buildings located in the site. At these locations, and in other surrounding areas where vibration would not be expected to cause cosmetic damage, vibration levels may still be perceptible. However, as with any type of construction, this would be anticipated and would not be considered significant, given the intermittent and short duration of the phases that have the highest potential of producing vibration (use of jackhammers and other high-power tools). By use of administrative controls, such as notifying neighbors of scheduled construction activities and scheduling construction activities with the highest potential to produce perceptible vibration during hours with the least potential to affect nearby businesses, perceptible vibration can be kept to a minimum.

Mitigation Measure 2: None required.

Impact 3: Excessive Aircraft Noise. The project site is located more than 4 miles from Oakland International Airport and more than 11 miles from the Hayward Executive Airport. The noise environment attributable to aircraft is considered normally acceptable under the Alameda County ALUC noise compatibility policies. This is a **less-than-significant** impact.

Oakland International Airport is a public-use airport located more than 4 miles southeast of the project site, and the Hayward Executive Airport is located more than 11 miles southeast of the project. According to the Alameda County ALUC, the project site lies well outside the 60 dBA CNEL/L_{dn} contour line (see Figure 3). The proposed project would be compatible with the City's exterior noise standards for aircraft noise and aircraft would not produce excessive noise levels for persons at the site. This would be a less-than-significant impact.

Mitigation Measure 3: None required.

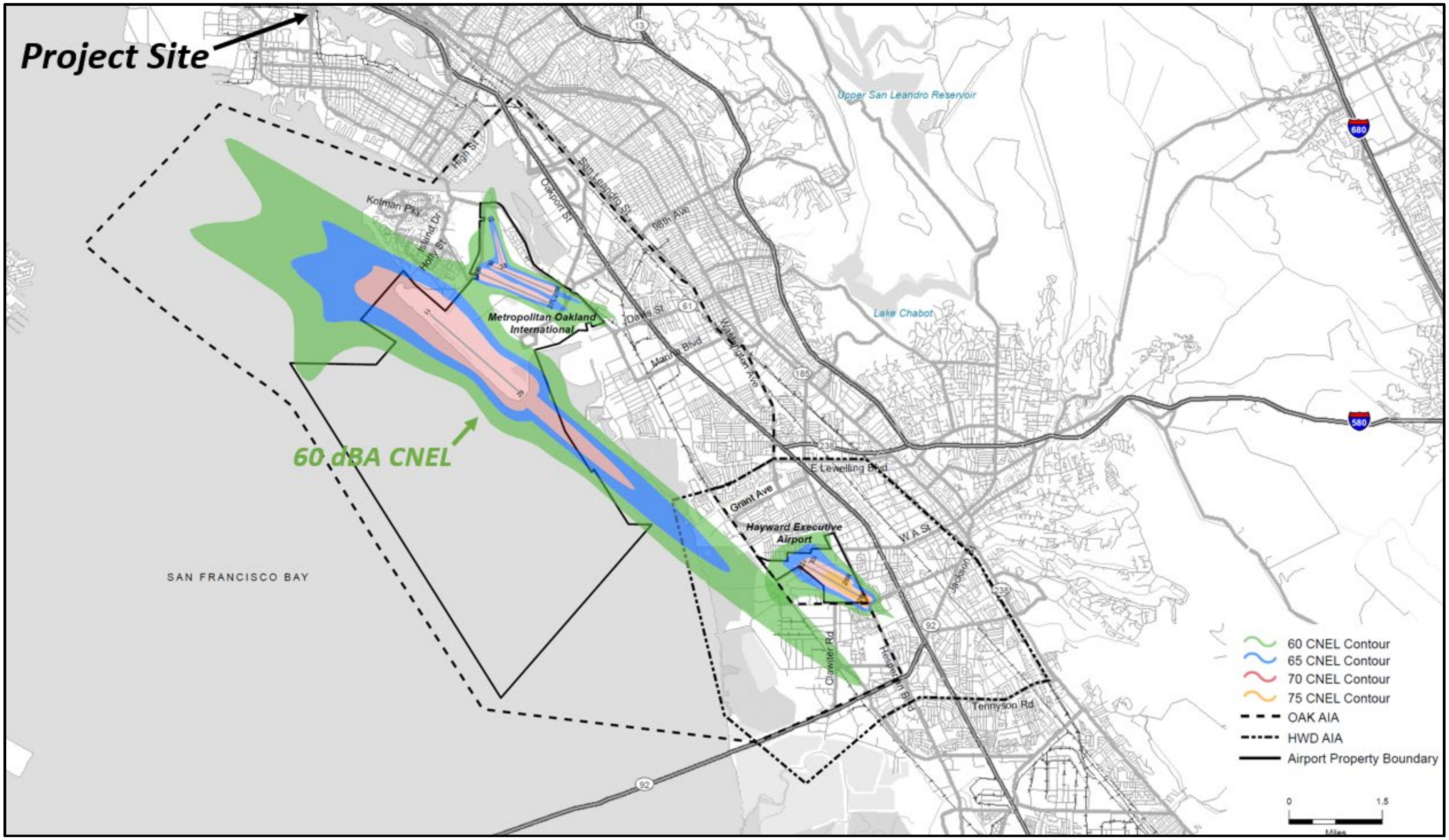


FIGURE 3 Noise Contours for Oakland International Airport and Hayward Executive Airport