830-848 SAN PABLO AVENUE WAREHOUSE DEVELOPMENT PROJECT NOISE AND VIBRATION ASSESSMENT

Pinole, California

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INTRODUCTION

The project site is located on a single vacant parcel that is 7.37 acres located at 830-848 San Pablo Avenue. The project proposes to construct two general industrial buildings totaling approximately 117,943 square feet (sf). The project site would be accessed via one existing driveway on San Pablo Avenue. The project would include surface parking lots throughout the site including 147 standard parking spaces, including 15 spaces for electric vehicles, and 9 truck trailer parking spaces. The exact usage of the proposed buildings is currently unknown, but it is expected to be warehouse and/or research & development. The project site is about 700 feet north of San Pablo Avenue.

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 three sections: 1) 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; 2) the Plan Consistency Analysis section discusses noise and land use compatibility utilizing policies in the City's General Plan; and 3) 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 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 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.

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 pm - 10:00 pm) and a 10 dB addition to nocturnal (10:00 pm - 7:00 am) noise levels. The *Day/Night Average Sound Level* (*DNL* or L_{dn}) 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 DNL. Typically, the highest steady traffic noise level during the daytime is about equal to the DNL 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. Sleep and speech interference is therefore possible when exterior noise levels are about 57 to 62 dBA DNL with open windows and 65 to 70 dBA DNL 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 DNL as a measure of noise has been found to provide a valid correlation of 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 DNL. At a DNL of about 60 dBA, approximately 12 percent of the population is highly annoyed. When the DNL 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 DNL of 60 to 70 dBA. Between a DNL 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 DNL 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.

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.

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 is used to evaluate construction generated vibration for building damage and human complaints. Table 3 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.

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, that may 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.

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.

Regulatory Background – Noise

This section describes the relevant guidelines, policies, and standards established by State Agencies and the City of Pinole. 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*,[1] which limit daytime construction noise to 80 dBA L_{eq} at residential land uses and to 90 dBA L_{eq} at commercial and 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;

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

(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 Cal Green Code. The State of California established exterior sound transmission control standards for new non-residential buildings as set forth in the 2022 California Green Building Standards Code (Section 5.507.4.1 and 5.507.4.2). The sections that pertain to this project are as follows:

> **5.507.4.1 Exterior noise transmission, prescriptive method.** Wall and roof-ceiling assemblies exposed to the noise source making up the building envelope shall meet a composite STC rating of at least 50 or a composite OITC rating of no less than 40, with exterior windows of a minimum STC of 40 or OITC of 30 when the building falls within the 65 dBA L_{dn} noise contour of a freeway or expressway, railroad, industrial source or fixed-guideway noise source, as determined by the local general plan noise element.
>
> **5.507.4.2 Performance method.** For buildings located, as defined by Section 5.507.4.1, wall and roof-ceiling assemblies exposed to the noise source making up the building envelope shall be constructed to provide an interior noise environment attributable to exterior sources that does not exceed an hourly equivalent noise level ($L_{eq\ (1\text{-}hr)}$) of 50 dBA in occupied areas during any hour of operation.

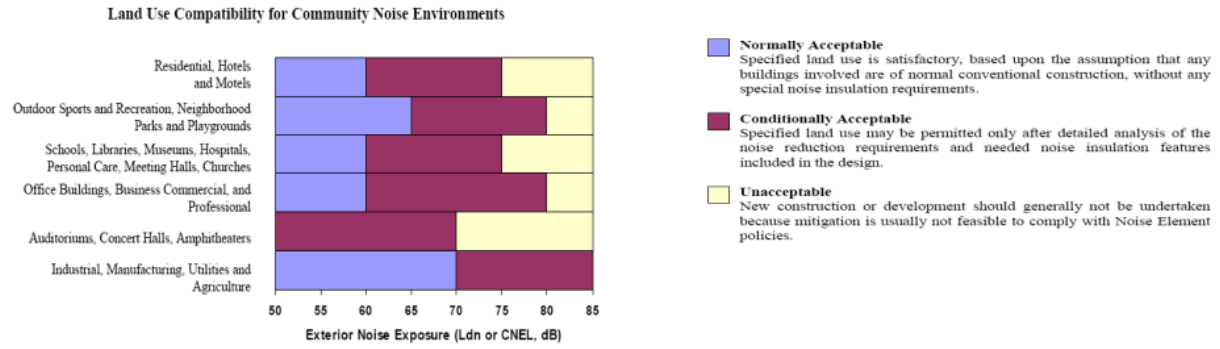
The performance method, which establishes the acceptable interior noise level, is the method typically used when applying these standards.

City of Pinole

Pinole General Plan Update 2010. The City of Pinole General Plan Health and Safety Element sets forth goals, policies, and actions related to noise in the community as follows:

GOAL HS.8 Ensure all new development complies with the noise standards established in the Pinole Health and Safety Element and prevent all new noise sources from increasing the existing noise levels above acceptable standards.

POLICY HS.8.1 New development projects should meet acceptable exterior noise level standards. The normally acceptable noise standards for new land uses are established in Land Use Compatibility for Community Exterior Noise Environments (as shown below).



Action HS.8.1.1 Adopt a noise ordinance with noise level performance standards, including maximum allowable noise exposure, ambient versus nuisance noise, method of measuring noise, and enforcement procedures.

Action HS.8.1.2 Review development proposals to assure consistency with noise standards. Require new development of noise-creating uses to conform to the City's noise level standards.

Action HS.8.1.3 Require a combination of design features to reduce noise impacts on adjacent properties through the following and other means, as appropriate:

- Screen and control noise sources such as parking, outdoor activities and mechanical equipment.
- Increase setbacks for noise sources from adjacent dwellings.
- Modify building designs and site planning to reduce noise exposure through a combination of sound attenuation (e.g., sound-rated windows and ventilation systems, insulation, physical and landscape buffers) and site planning (e.g., increased separation and private open area buffers) to reduce noise exposure.
- Control hours of operation, including deliveries and trash pickup, to minimize noise impacts.
- Require additional landscaping to assist with buffering where feasible.

Action HS.8.1.4 New development of noise-sensitive land uses will not be permitted in areas exposed to existing or planned transportation noise sources that exceed the levels specified in Policy HS.8.1, unless the project design includes measures to reduce exterior and interior noise levels to those specified in Policy HS.8.1 of the proposed General Plan Update.

Action HS.8.1.5 Require the use of temporary construction noise control measures including the use of temporary noise barriers, temporary relocation of noise-sensitive land uses, or other appropriate measures as mitigation for noise generated during construction of public and/or private projects.

POLICY HS.8.2 Ensure that proposed nonresidential land uses likely to exceed the City's standards do not create noise disturbances in existing noise-sensitive areas.

Action HS.8.2.1 Require an acoustical analysis as part of the environmental review process when noise-sensitive land uses are proposed in areas where current or projected exterior noise levels exceed the City's standards.

Action HS.8.2.2 Require that any potential noise impacts identified during the acoustical analysis be mitigated in the project design to the maximum extent feasible.

Action HS.8.2.3 Prepare and periodically update a map of citywide noise-sensitive areas.

POLICY HS.8.3 Work with the railroads and adjoining communities to seek quiet zone status for rail lines through Pinole.

POLICY HS.8.4 Require site-specific noise studies for noise-sensitive projects which may be affected by railroad noise, and incorporate noise attenuation measures into the project design to reduce any impacts.

GOAL HS.9 Eliminate or reduce noise from existing objectionable noise sources.

POLICY HS.9.1 Noise created by commercial or industrial sources associated with new projects or developments should be controlled so as not to exceed the noise level standards set forth in the table below (Maximum Allowable Noise Exposure for Stationary Noise Sources), as measured at any affected residential land use.

Action HS.9.1.1 Adopt the following allowable noise standards:

Maximum Allowable Noise Exposure for Stationary Noise Sources[1]

	Daytime [5] (7 AM to 10 PM)	Nighttime [2, 5] (10 PM to 7 AM)
Hourly L_{eq}, dB [3]	55	45
Maximum Level, dB [3]	70	65
Maximum Level, dB – Impulsive Noise [4]	65	60

1. *As determined at the property line of the receiving land use. When determining effectiveness of noise mitigation measures, the standards may be applied on the receptor side of noise barriers or other property line noise mitigation measures.*
2. *Applies only where the receiving land use operates or is occupied during nighttime hours.*
3. *Sound level measurements shall be made with "slow" meter response.*
4. *Sound level measurements shall be made with "fast" meter response.*
5. *Allowable levels shall be raised to the ambient noise levels where the ambient levels exceed the allowable levels. Allowable levels shall be reduced 5 dB if the ambient hourly Leq is at least 10 dB lower than the allowable level.*

POLICY HS.9.2 Require new noise sources to use best available control technology (BACT) to minimize noise emissions.

Action HS.9.2.1 Noise control techniques used should be what most effectively mitigates the noise impacts of the development. Such measures may include building setbacks, building orientation and noise barriers. If a noise barrier is required for mitigation of exterior noise levels, it should be constructed of tight-fitting, massive materials (1-inch-thick wood, stucco, masonry, etc.) and should be of sufficient height to interrupt line of sight between the source and receiver. Line of sight should be determined by drawing a straight line between the effective heights of the noise source and receiver.

POLICY HS.9.3 Work with the railroad companies to reduce existing rail noise in Pinole.

Action HS.9.3.1 Establish a quiet zone designation at the railroad crossings in Pinole. Work with railroad companies to determine and install required safety devices to acquire the designation.

City of Pinole Municipal Code. City of Pinole Municipal Code standards relevant to the proposed project are outlined in Chapters 8 and 15 of the Municipal Code.

8.35.010 FINDINGS AND PURPOSE.

The city council declares that certain loud noises are detrimental to the health and welfare of the citizenry and should be regulated in the public interest. The purpose of this chapter is to limit and control excessive, unnecessary, annoying and unreasonable noises within the city in order to protect the peace, health, safety and welfare of the citizens of Pinole.

(Ord. 2017-05 § 2 (part), 2017)

8.35.020 DEFINITIONS.

A. ***COMMERCIAL PURPOSE.*** The use, operation, or maintenance of sound-amplifying equipment for the purpose of advertising business, goods and services, or for the purpose of attracting the attention of the public to, or advertising for, or soliciting patronage to or for a performance, show, entertainment, exhibition or event, or for the purpose of demonstrating any such sound equipment.

B. ***EMERGENCY.*** Conditions posing an imminent danger to the public health or safety of any individual.

C. ***SOUND-AMPLIFYING EQUIPMENT.*** Any machine or device for the amplification of the human voice, music, or any other sound, excluding a warning device on authorized emergency vehicle or horn or other warning device used for traffic safety purposes.

(Ord. 2017-05 § 2 (part), 2017)

8.35.030 GENERAL NOISE REGULATIONS.

A. It is unlawful for a person to willfully make a loud, unnecessary or unusual noise which disturbs the peace or quiet of a neighborhood or which causes discomfort or annoyance to a reasonable person of normal sensitiveness residing in the area.

B. The factors which shall be considered in determining whether a violation of this section exist shall include, but are not limited to, the following:

1. The sound level of the objectionable noise when compared to all audible noise in the area;

2. Whether the nature of the noise is usual or unusual;

3. The proximity of the noise to residential sleeping areas;

4. The nature and zoning of the area from which the noise emanates;

5. The density of the inhabitation of the area from which the noise emanates;

6. The time of day or night the noise occurs;

7. The duration of the noise;

8. Whether the noise is continuous, recurrent or intermittent;

9. Whether the noise is produced by a commercial or noncommercial activity;

10. Whether the noise is caused by sound amplifying equipment.

(Ord. 2017-05 § 2 (part), 2017)

8.35.040 USE PERMIT.

A. Use permit. The city may grant a use permit allowing noise generating events or land uses on a temporary basis as described in Chapter 17.12 of the Zoning Code. Noise generating use permits shall be of as short duration as reasonable. An application for a permit must be submitted at least ten business days before the proposed activity and must be accompanied by an application fee in the amount set by city council resolution.

B. Emergencies. This chapter shall not apply to emergencies.
(Ord. 2017-05 § 2 (part), 2017)

8.35.050 PENALTIES.

A. Violation an infraction. A person who violates a provision of this section is guilty of an infraction and subject to the penalty set forth in Chapter 1.12 of this code.

B. Violation a nuisance. In addition to the penalties herein provided, any condition caused, maintained or permitted to exist in violation of any of the provisions of this chapter is a threat to the public health, safety and welfare, and is declared and deemed a public nuisance and shall be punishable as such as provided by this code and applicable law.
(Ord. 2017-05 § 2 (part), 2017)

15.02.070 PERMITTED HOURS AND CONDITION OF CONSTRUCTION; PENALTIES.

A. Work is allowed from seven a.m. (7:00 a.m.) to five p.m. (5:00 p.m.) on non-federal holidays. Work is allowed on holidays recognized by the City of Pinole, but not acknowledged federally which include Cesar Chavez's Birthday and the Day After Thanksgiving, but no inspections will be performed.

B. Saturday work is allowed in commercial zones only, from nine a.m. (9:00 a.m.) to six p.m. (6:00 p.m.), as long as it is interior work and does not generate significant noise.

C. Exceptions for residential property owners.

1. Homeowners performing additions, repairs, or remodeling are allowed to work on their residences on weekends and holidays between nine a.m. (9:00 a.m.) and five p.m. (5:00 p.m.).

2. By written authorization of the Building Official, a residential property owner with a valid permit to construct a single-family residence for personal occupancy shall be allowed to work on weekends and holidays between nine a.m. (9:00 a.m.) and five p.m. (5:00 p.m.). This authorization shall be granted to applicants who have not built a residence in the City in the previous five (5) year period and who affirm in writing their intention to reside at the subject property.

D. Exceptions for commercial construction. The City Council designates the City Manager (or his/her designee) to further modify on a case-by-case basis the hours of construction in commercial zones. Additionally, the City Manager (or his/her designee) has the ability to modify the construction hours on a case-by-case basis based on inclement weather conditions or certain construction procedures (such as setting up for a concrete pour) and construction project characteristics that may require working beyond five p.m. (5:00 p.m.) on weekdays or six p.m. (6:00 p.m.) on Saturday.

E. The minimum fine for a citation or penalty for violating construction hours is one thousand dollars ($1,000.00), and escalates in one thousand dollars ($1,000.00) increments.

F. Work must be controlled to prevent causing a public nuisance due to dust, noise, vibrations, and the like.

(Ord. 2019-08 § 3 (part), 2019; Ord. 2016-08 § 3 (part), 2016)

Existing Noise Environment

The project site is located at 830-848 San Pablo Avenue in Pinole, California. The western portion of the site is a former auto wrecking yard that was previously developed with a commercial building and a detached single-family residence; these buildings have been demolished. The eastern portion is undeveloped and is crossed by a seasonal drainage channel. The site is bound to the south and west by industrial land uses; to the north by the Burlington Northern Santa Fe rail line, with the Union Pacific rail line and San Francisco Bay to the north of the railroad tracks; and to the east by residential land uses.

The existing noise environment at the site results primarily from traffic noise along San Pablo Avenue and operational noise from surrounding industrial land uses.

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 made at the site between Wednesday, October 19, 2022, and Friday, October 21, 2022. All measurement locations are shown in Figure 1.

Long-term noise measurement LT-1 was made in the southwestern corner of the project site, approximately 500 feet east of Pinole Shores Drive and approximately 350 feet southeast of the nearest Burlington Northern Santa Fe rail line tracks. Hourly average noise levels typically ranged from 44 to 63 dBA L_{eq} during daytime hours (7:00 a.m. and 10:00 p.m.) and from 39 to 54 dBA L_{eq} during nighttime hours (10:00 p.m. and 7:00 a.m.). The day-night average noise level on Thursday, October 20, 2022, was 56 dBA DNL. The daily trend in noise levels at LT-1 is shown in Figures A1 through A3 of Appendix A.

LT-2 was made approximately 35 feet south of the nearest Burlington Northern Santa Fe rail line tracks along the northern boundary of the project site. Hourly average noise levels at LT-2 typically ranged from 43 to 68 dBA L_{eq} during daytime hours and from 39 to 68 dBA L_{eq} during nighttime hours. The day-night average noise level on Thursday, October 21, 2022, was 66 dBA DNL. The daily trend in noise levels at LT-2 is shown in Figures A4 through A6 of Appendix A.

Short-term noise measurements were made on Wednesday, October 19, 2022, between 12:40 p.m. and 1:00 p.m. (ST-1) and on Thursday, October 20, 2022, between 10:20 a.m. and 11:00 a.m. (ST-2 and ST-3) in 10-minute intervals. Results of the measurements are summarized in Table 4.

ST-1 was made near LT-2, approximately 130 feet from the nearest Burlington Northern Santa Fe rail line tracks. Ambient background noise levels (in the absence of vehicle and train noise) at ST-1 was about 43 to 45 dBA. A freight train with two engines and 68 cars traveling southbound at about 20 mph passed ST-1 between 12:41 p.m. to 12:46 p.m., generating noise levels of 53 to 69 dBA. A freight train on the UPRR tracks (about 595 feet from ST-1), which is barely visible due to terrain, traveled northbound between 12:55 p.m. and 12:58 p.m. at 40 mph, generating noise levels at ST-1 of 53 to 65 dBA. Additional noise sources included a fog horn (47 to 49 dBA), a distant leaf blower (44 dBA), birds (47 dBA), and distant train whistles (51 to 65 dBA). The 10-minute L_{eq} measured at ST-1 ranged from 56 to 57 dBA.

ST-2 was made at 560 Sunnyview Drive, along the eastern boundary of the project site. Eleven passenger cars traveled along Sunnyview Drive in this 10-minute period, generating noise levels

of 43 to 50 dBA. Traffic noise from distant sources ranged from 43 to 47 dBA. Additional noise sources included surrounding industrial uses (46 to 47 dBA) and birds (49 dBA). The 10-minute L_{eq} measured at ST-2 was 45 dBA.

ST-3 was made at 648 Carlotta Circle, north of the Burlington Northern Santa Fe rail line tracks. Note, ST-3 was made behind an eight-foot sound wall located along the tracks. A single passenger car passed along Carlotta Circle during this 10-minute period, generating noise levels of 56 dBA. Train pass-bys generated noise levels of 47 to 59 dBA at ST-3. Additional sources included birds (46 to 52 dBA), nearby industrial sources (46 to 52 dBA), and jet flyovers (56 dBA). The 10-minute L_{eq} measured at ST-3 was 51 dBA.

TABLE 4 Summary of Short-Term Noise Measurements (dBA)

Noise Measurement Location	Date, Time	Measured Noise Level, dBA					
		L_{max}	$L_{(1)}$	$L_{(10)}$	$L_{(50)}$	$L_{(90)}$	L_{eq}
ST-1: ~130 feet from the nearest Burlington Northern Santa Fe rail line tracks	10/19/2022, 12:40-12:50	69	68	59	53	45	57
	10/19/2022, 12:50-13:00	65	64	60	51	47	56
ST-2: at 560 Sunnyview Drive	10/20/2022, 10:20-10:30	50	49	46	45	44	45
ST-3: ~115 feet from the centerline of Piercy Road	10/20/2022, 10:50-11:00	59	58	53	50	48	51

FIGURE 1 Aerial Image of the Project Site and Vicinity Showing Long- and Short-Term Measurement Locations

Source: Google Earth, 2023.

PLAN CONSISTENCY ANALYSIS

Noise and Land Use Compatibility

The Cal Green Code standards specify an interior noise environment attributable to exterior sources not to exceed an hourly equivalent noise level ($L_{eq\ (1\text{-}hr)}$) of 50 dBA in occupied areas of nonresidential uses during any hour of operation.

The future noise environment at the site would continue to result primarily from vehicular traffic along San Pablo Avenue and train activity on the adjoining tracks. The traffic study completed for the proposed project includes existing and cumulative plus project traffic volumes. Comparing the cumulative plus project volumes to the existing volumes resulted in a noise level increase of 2 dBA DNL. Train activity is not expected to change under future project conditions and therefore would not contribute to a measurable noise level increase.

Future Interior Noise Environment

The nearest building façade is more than 700 feet from the centerline of San Pablo Avenue. At this distance, daytime hourly average noise levels at the proposed building exteriors would range from 46 to 66 dBA L_{eq}, with day-night average noise levels up to 58 dBA DNL.

The nearest building façades to the UPRR tracks would be set back about 100 feet from the edge of the near tracks. At this distance, daytime hourly average noise levels at the building exteriors would range from 39 to 64 dBA L_{eq}, with day-night average noise levels up to 63 dBA DNL.

Standard construction materials for non-residential uses would provide about 25 dBA of noise reduction in interior spaces. The inclusion of adequate forced-air mechanical ventilation systems is normally required so that windows may be kept closed at the occupant's discretion and would provide an additional 5 dBA reduction. The standard construction materials in combination with forced-air mechanical ventilation would satisfy the daytime threshold of 50 dBA $L_{eq(1\text{-}hr)}$.

NOISE IMPACTS AND MITIGATION MEASURES

This section describes the significance criteria used to evaluate project impacts under CEQA, provides a discussion of each project impact, and presents mitigation measures, where necessary, to reduce project impacts to less-than-significant levels.

Significance Criteria

The following criteria were used to evaluate the significance of environmental noise and vibration 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.** Existing noise-sensitive land uses would be exposed to a temporary increase in ambient noise levels for a period of less than one year. With the implementation of measures identified in the General Plan and included in the *Initial Study*,[2] this temporary noise increase would be reduced to a **less-than-significant** level.

The project applicant proposes the construction of two light industrial buildings on the project site. The construction schedule assumed that the earliest possible start date would be early April 2023, and the development would be built over a period of about seven months, with construction expected to conclude by the end of October 2023. Construction phases would include 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.

Action HS.8.1.5 of the City's General Plan requires the use of temporary construction noise control measures, including the use of temporary noise barriers, to reduce temporary noise levels during construction. Additionally, the Municipal Code limits construction hours to between 7:00 a.m. and 5:00 p.m. on non-federal holidays. Saturday work is allowed in commercial zones only between 9:00 a.m. and 6:00 p.m., as long as construction activities are limited to interior work and does not generate significant noise.

While the City of Pinole 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*.[1] During daytime hours, an exterior threshold of 80 dBA L_{eq} shall be applied at residential land uses and 90 dBA L_{eq} shall be applied at commercial and industrial land uses.

Construction activities for individual projects are typically carried out in phases. During each phase of construction, there would be a different mix of equipment operating, and noise levels

[2] City of Pinole, *Pinole Shores Business Park Initial Study*, October 5, 2005.

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. The typical range of maximum instantaneous noise levels for the proposed project would be 70 to 90 dBA L_{max} at a distance of 50 feet (see Table 5) from the equipment. Table 6 shows the hourly average noise level ranges, by construction phase, typical for various types of projects. Hourly average noise levels generated by construction are about 75 to 89 dBA L_{eq} for industrial buildings, 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 result in lower construction noise levels at distant receptors.

Equipment expected to be used in each construction phase are summarized in Table 7, along with the quantity of each type of equipment and the reference noise level at 50 feet, assuming the operation of the two loudest pieces of construction equipment for each construction phase.

Federal Highway Administration's (FHWA's) Roadway Construction Noise Model (RCNM) was used to calculate the hourly average noise levels for each phase of construction, assuming the two loudest pieces of equipment would operate simultaneously, as recommended by the FTA for construction noise evaluations. This construction noise model includes representative sound levels for the most common types of construction equipment and the approximate usage factors of such equipment that were developed based on an extensive database of information gathered during the construction of the Central Artery/Tunnel Project in Boston, Massachusetts (CA/T Project or "Big Dig"). The usage factors represent the percentage of time that the equipment would be operating at full power. Table 7 also summarizes the construction noise levels for the two loudest pieces of equipment propagated to the surrounding receiving land uses.

To assess construction noise impacts at the receiving property lines of existing noise-sensitive receptors, the worst-case hourly average noise level, which would result in the noise levels summarized in Table 7, was propagated from the geometrical center of the nearest building to the property lines of the receptors. These noise level estimates are shown in Table 8. Noise levels in Table 8 do not assume reductions due to intervening buildings or existing barriers.

TABLE 5 Construction Equipment 50-Foot Noise Emission Limits

Equipment Category	L_{max} Level (dBA)[1,2]	Impact/Continuous
Arc Welder	73	Continuous
Auger Drill Rig	85	Continuous
Backhoe	80	Continuous
Bar Bender	80	Continuous
Boring Jack Power Unit	80	Continuous
Chain Saw	85	Continuous
Compressor[3]	70	Continuous
Compressor (other)	80	Continuous
Concrete Mixer	85	Continuous
Concrete Pump	82	Continuous
Concrete Saw	90	Continuous
Concrete Vibrator	80	Continuous
Crane	85	Continuous
Dozer	85	Continuous
Excavator	85	Continuous
Front End Loader	80	Continuous
Generator	82	Continuous
Generator (25 KVA or less)	70	Continuous
Gradall	85	Continuous
Grader	85	Continuous
Grinder Saw	85	Continuous
Horizontal Boring Hydro Jack	80	Continuous
Hydra Break Ram	90	Impact
Impact Pile Driver	105	Impact
Insitu Soil Sampling Rig	84	Continuous
Jackhammer	85	Impact
Mounted Impact Hammer (hoe ram)	90	Impact
Paver	85	Continuous
Pneumatic Tools	85	Continuous
Pumps	77	Continuous
Rock Drill	85	Continuous
Scraper	85	Continuous
Slurry Trenching Machine	82	Continuous
Soil Mix Drill Rig	80	Continuous
Street Sweeper	80	Continuous
Tractor	84	Continuous
Truck (dump, delivery)	84	Continuous
Vacuum Excavator Truck (vac-truck)	85	Continuous
Vibratory Compactor	80	Continuous
Vibratory Pile Driver	95	Continuous
All other equipment with engines larger than 5 HP	85	Continuous

Notes:

[1] Measured at 50 feet from the construction equipment, with a "slow" (1 sec.) time constant.

[2] Noise limits apply to total noise emitted from equipment and associated components operating at full power while engaged in its intended operation.

[3] Portable Air Compressor rated at 75 cfm or greater and that operates at greater than 50 psi.

TABLE 6 Typical Ranges of Construction Noise Levels at 50 Feet, L_{eq} (dBA)

	Domestic Housing		Office Building, Hotel, Hospital, School, Public Works		Industrial Parking Garage, Religious Amusement & Recreations, Store, Service Station		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.

TABLE 7 Estimated Construction Noise Levels for the Proposed Industrial Buildings at a Distance of 50 feet

Phase of Construction	Total Workdays	Construction Equipment (Quantity)	Estimated Construction Noise Level at 50 feet
Site Preparation	5 days	Grader (2)[a] Rubber-Tired Dozer (2) Tractor/Loader/Backhoe (2)[a]	84 dBA L_{eq}
Grading/Excavation	10 days	Excavator (1) Grader (1)[a] Rubber-Tired Dozer (1) Tractor/Loader/Backhoe (2)[a]	84 dBA L_{eq}
Trenching/Foundation	20 days	Tractor/Loader/Backhoe (1)[a] Excavator (1)[a]	82 dBA L_{eq}
Building – Exterior	150 days	Crane (1) Forklift (2) Generator Set (1) Tractor/Loader/Backhoe (2)[a] Welder (1)	83 dBA L_{eq}
Building – Interior/ Architectural Coating	30 days	Air Compressor (1)[a]	74 dBA L_{eq}
Paving	30 days	Cement and Mortar Mixer (2) Paver (1)[a] Paving Equipment (1)[a] Roller (2) Tractor/Loader/Backhoe (1)[a]	84 dBA L_{eq}

[a] Denotes two loudest pieces of construction equipment per phase.

TABLE 8 Estimated Construction Noise Levels at Nearby Land Uses

Phase of Construction	Calculated Hourly Average Noise Levels, L_{eq} (dBA)			
	East Residential (255ft[a])	Northwest Residential (390ft[a])	Distant South Residential (895ft[a])	South Office & Commercial (145ft[a])
Site Preparation	70 dBA L_{eq}	66 dBA L_{eq}	59 dBA L_{eq}	75 dBA L_{eq}
Grading/ Excavation	70 dBA L_{eq}	66 dBA L_{eq}	59 dBA L_{eq}	75 dBA L_{eq}
Trenching/Foundation	68 dBA L_{eq}	64 dBA L_{eq}	57 dBA L_{eq}	72 dBA L_{eq}
Building –Exterior	69 dBA L_{eq}	65 dBA L_{eq}	58 dBA L_{eq}	74 dBA L_{eq}
Building – Interior/ Architectural Coating	60 dBA L_{eq}	56 dBA L_{eq}	49 dBA L_{eq}	65 dBA L_{eq}
Paving	70 dBA L_{eq}	67 dBA L_{eq}	59 dBA L_{eq}	75 dBA L_{eq}

[a] The distances shown in the table were measured from the center of the nearest project building to the receiving property lines.

As shown in Table 8, construction noise levels would intermittently range from 49 to 70 dBA L_{eq} at existing residential uses and from 65 to 75 dBA L_{eq} at existing office and commercial uses when activities are focused near the center of the nearest project buildings. These construction noise levels would not exceed the exterior threshold of 80 dBA L_{eq} at existing residential land uses surrounding the site (i.e., east of the site, northwest of the site, and more than 800 feet south of the site) or the 90 dBA L_{eq} threshold at office and commercial land uses in the project vicinity when activities occur near the center of the buildings. When occurring 50 feet from the adjoining property lines, construction noise levels would range from 74 to 84 dBA L_{eq}.

While specific construction activities would at times exceed these thresholds when work is conducted near shared property lines, construction would move throughout the project site during the planned seven-month period. While the proposed project would result in temporary noise increases above ambient conditions, the *Initial Study* included measures consistent with those identified in the City's General Plan that would reduce the impact to a less-than-significant level. These measures shall be included as part of the proposed project as a condition of approval:

- The construction contractor shall locate stationary noise sources as far from existing sensitive receptors as possible. If stationary sources must be located near existing sensitive receptors, they shall be muffled and enclosed within temporary sheds or other structures.

- At a minimum, the construction contractor shall implement the following control measures: improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures, and acoustically-attenuating shields or shrouds. Noise controls can reduce noise levels at 50 feet by 1 to 16 dBA, depending on the type of equipment.

- Equipment used for project construction shall be hydraulically or electrically powered impact tools (e.g., jack hammers) wherever possible to avoid noise associated with compressed air exhaust from pneumatically-powered tools. Where use of pneumatically-powered tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used. A muffler could lower noise levels from the exhaust by up to about 10 dBA. External jackets on the tools themselves shall be used where feasible; this could achieve a reduction of 5 dBA. Quieter procedures shall be used (such as drilling rather than impact equipment) wherever feasible.

- The construction contractor shall not allow any construction equipment, trucks, or vehicles to idle.

- Prior to the commencement of any construction activities, the construction contractor shall notify, via mail, all residences within a 300-foot radius of the project site of the project's approximate construction schedule, including the approximate duration of demolition, clearing, grading, excavation, paving, and building construction, et al. In addition, at least 24 hours prior to grading activities, the construction contractor shall post signage in appropriate locations within a 300-foot radius of the project site. The signage shall include a phone number to the City Public Works Department for residents to call with noise complaints. If the City Public Works Department receives

more than three complaint calls regarding construction noise, the City reserves the discretion to require the project applicant to conduct an acoustical noise analysis to determine more appropriate measures to reduce noise levels due to construction activities.

- The construction contractor shall limit construction activity to the hours of 7:00 a.m. to 5:00 p.m. on weekdays. No construction will be allowed on weekends and holidays recognized by the City of Pinole. Debris hauling and materials delivery shall be prohibited between the hours of 7:30 to 8:30 a.m. and 4:00 to 5:00 p.m.

- All staging of construction equipment, trucks, and vehicles shall be limited to the southern and western portions of the project site, as far away from residential development to the east as possible.

- All construction trucks and vehicles shall access the site via San Pablo Avenue.

With the implementation of the General Plan and Municipal Code requirements, as well as the above measures as conditions of approval, the temporary construction noise impact would be reduced to a less-than-significant level.

Recommended Condition 1a: None required.

Impact 1b: Permanent Noise Level Increase/Exceed Applicable Standards. The proposed project would not result in a substantial permanent noise level increase, but could generate noise levels that would exceed the applicable standards at the residential uses to the east. **This is a potentially significant impact.**

The State of California and City of Pinole would consider a significant permanent noise impact to occur if one or more of the following happen due to proposed project:

- The project would increase noise levels at noise-sensitive receptors by 3 dBA DNL or more where ambient noise levels exceed the "normally acceptable" noise level standard (60 dBA DNL according to the City's General Plan) or by 5 dBA DNL or more where ambient noise levels are at or below 60 dBA DNL. The permanent noise level increase is calculated by comparing the day-night average noise levels (estimated on a 24-hour basis) generated by new sources at the project site to the existing ambient noise levels at receptors.

- The proposed industrial project generates noise levels from stationary sources exceeding hourly average noise levels of 55 dBA L_{eq} during daytime hours between 7:00 a.m. and 10:00 p.m. and 45 dBA L_{eq} during nighttime hours between 10:00 p.m. and 7:00 a.m. at existing residential land uses, as established in Policy HS.9.1 of the City's General Plan. Hourly average noise levels for noise sources at the project site are averaged over a 60-minute period based on realistic usage of each source in a given hour.

- The proposed industrial project generates noise levels from stationary sources exceeding maximum instantaneous noise levels of 70 dBA L_{max} during daytime hours and 65 dBA L_{max}

during nighttime hours at existing residential land uses. For impulsive noise sources, maximum noise levels of 65 and 60 dBA L_{max} shall not be exceeded during daytime and nighttime hours, respectively. These instantaneous thresholds could be generated in less than 1 minute in any given hour.

Existing residences are located to the east and to the northwest of the project site, as well as south of San Pablo Avenue. All surrounding residences would continue be exposed to noise from existing train activity and vehicular traffic.

Project Traffic Increase

The traffic study included peak hour turning movements for existing and existing plus project traffic volumes at two intersections in the vicinity of the project site: 1) project driveway/Meadow Avenue and San Pablo Avenue; and 2) Pinon Avenue/Appian Way and San Pablo Avenue. By comparing the existing plus project volumes to the existing volumes, the project's contribution to the overall noise increase is calculated. Table 9 summarizes the estimated noise level increase along each roadway segment included in the traffic report. As shown in Table 9, the project's traffic would result in a 1 dBA DNL increase along Meadow Avenue, south of San Pablo Avenue. All remaining segments would not measurably contribute to ambient noise levels in the area (0 dBA DNL increase). This would be a less-than-significant impact.

TABLE 9 Estimated Noise Level Increases of Existing Plus Project Traffic Volumes Over Existing Volumes at Receptors in the Project Vicinity

Roadway	Segment	Existing Noise Levels	Existing Plus Project Noise Levels	Estimated Noise Level Increase
Meadow Avenue	South of San Pablo Avenue	56 dBA DNL	57 dBA DNL	1 dBA DNL
Pinon Avenue	North of San Pablo Avenue	52 dBA DNL	52 dBA DNL	0 dBA DNL
Appian Way	South of San Pablo Avenue	64 dBA DNL	64 dBA DNL	0 dBA DNL
San Pablo Avenue	East of Pinon Avenue/Appian Way	69 dBA DNL	69 dBA DNL	0 dBA DNL
	Pinon Avenue/Appian Way to Meadow Avenue	68 dBA DNL	68 dBA DNL	0 dBA DNL
	West of Meadow Avenue	68 dBA DNL	68 dBA DNL	0 dBA DNL

Mechanical Equipment

The exact usage of the proposed buildings is yet to be determined. Potential uses include warehouse and/or research and development activities. Without knowing the specific uses, details pertaining to the type, number, location, etc. of mechanical equipment are unavailable at this time. For these types of uses, however, typical equipment would include heating, ventilation, air conditioning (HVAC) systems, exhaust fans, chillers, etc. Typically, most of the equipment would be located on the roof or in the loading dock areas, which the site plan shows along the southern façade of Building 1 and the northern façade of Building 2. Since the proposed buildings would shield most equipment noise located in the loading docks from the surrounding land uses, the worst-case scenario would be mechanical equipment located on the rooftops of each building, which would be a minimum 15 feet above the ground for the proposed buildings.

For light industrial uses similar to the proposed project, typical mechanical equipment would generate noise levels ranging from 61 to 62 dBA at a distance of 20 feet. This type of equipment generates constant noise levels during operation, which means the maximum noise level generated by mechanical equipment would be equal to the hourly average noise level, assuming the equipment operates continuously throughout the hour. Typically, buildings such as the proposed project would have multiple systems operating simultaneously at any given time. Assuming up to five pieces of equipment operate simultaneously at any time every hour during a 24-hour period, which would represent worst-case conditions, the total potential noise generated by the mechanical equipment would be up to 69 dBA L_{eq} (hourly average noise level) and 75 dBA DNL at 20 feet (day-night average noise level).

The estimated mechanical equipment noise levels due to such equipment propagated to the nearest property lines of the surrounding land uses are summarized in Table 10. For the ground-level receptors located within 200 feet of the proposed buildings (i.e., the residential land uses to the east and northwest and the office and commercial buildings to the south), a minimum equipment setback of 10 feet from the edge of the rooftop would result in at least 5 dB attenuation. This attenuation would also take into account the existing eight-foot sound wall along the residential boundary of the land uses to the northwest. The residences located south of San Pablo Avenue would be mostly shielded by the office and commercial buildings south of the project site. These buildings would provide a minimum attenuation of 10 dBA for the distant residences to the south.

Hourly average noise levels due to mechanical equipment would be up to 47 dBA L_{eq} at the residences to the east, while all other residences would be exposed to mechanical equipment noise levels up to 45 dBA L_{eq}. During daytime hours, the 55 dBA threshold would not be exceeded. However, the 45 dBA threshold would potentially be exceeded during nighttime hours at the residences to the east. This would be a potentially significant impact.

As stated above, this noise source would generate constant noise levels throughout a given hour, making the hourly average noise levels and the maximum instantaneous noise levels equivalent. Maximum noise level thresholds of 70 dBA during daytime hours and 65 dBA during nighttime hours would not be exceeded. This would be a less-than-significant impact.

A permanent noise level increase of 1 dBA DNL was calculated at the adjoining office and commercial uses to the south; however, these would not be considered noise-sensitive uses subject to the permanent noise increase standard. For all residential land uses, the calculated noise level increase would not measurably contribute to ambient noise levels in the area (0 dBA DNL increase). This would be a less-than-significant impact.

TABLE 10 Estimated Mechanical Equipment Noise Levels at Receiving Land Uses

Receptor	Distance from Rooftop Equipment	Hourly L_{eq}		DNL	Noise Level Increase, DNL
		Estimated L_{eq} at Receiving Property Line	55 dBA (Daytime) or 45 dBA (Nighttime) Exceeded?[a]		
East Residential	140 feet	46 to 47 dBA[b]	No (daytime) Yes (nighttime)	54 dBA[b]	0 dBA
Northwest Residential	185 feet	44 to 45 dBA[b]	No (both)	51 dBA[b]	0 dBA
Distant South Residential	795 feet	26 to 27 dBA[c]	No (both)	33 dBA[c]	0 dBA
South Office & Commercial	45 feet	56 to 57 dBA[b]	N/A	63 dBA[b]	1 dBA

[a] Thresholds apply to residential receptors only.
[b] Minimum attenuation of 5 dB is assumed due to elevation of noise sources and distance of ground-level receptors being within 200 feet of the proposed buildings.
[c] Minimum attenuation of 10 dB is assumed due to intervening buildings and distance of receptors being more than 700 feet of the proposed buildings.

Parking Lot Noise

Surface parking for passenger cars would be located along the building perimeters. The only truck parking spaces would be located at the loading docks between the two buildings, which is discussed under the truck loading section.

Noise sources associated with the use of the parking lots would include vehicular circulation, loud engines, door slams, and human voices. The maximum noise level of a passing car at 15 mph typically ranges from 45 to 55 dBA L_{max} at a distance of 100 feet. The noise generated during an engine start is similar. Door slams cause slightly lower noise levels. The hourly average noise levels resulting from all of these noise-generating activities in a busy parking lot typically ranges from 40 to 50 dBA L_{eq} at a distance of 100 feet from the parking area. Noise levels decrease at a rate of 6 dB per doubling of distance.

For the proposed project, busy parking lot noise would only be expected during daytime hours when most employees would be accessing the site. Some cars may access the site during nighttime hours, but passenger car activity would occur for minimal time in a given hour and would result in insignificant hourly average noise levels; however, one car in an hour would generate instantaneous noise levels, which would be compared to maximum noise levels established by the City. Therefore, hourly average noise levels during daytime hours only and maximum instantaneous noise levels during daytime and nighttime hours are used in parking lot analysis.

Table 11 summarizes the estimated parking lot noise at the surrounding receptors when the noise source is centered at the nearest parking spaces facing the receptors. The residences to the northwest would be partially shielded from the ground-level parking lot noise by the eight-foot sound wall along their property lines. Conservatively, a 5 dBA attenuation is assumed for these receptors. Additionally, the intervening office and commercial buildings would provide attenuation for the distant residences to the south. Conservatively, a 10 dBA attenuation is assumed for these receptors. Residences to the east would have direct line-of-sight to parking lot activity. No attenuation is assumed for these receptors.

Hourly average noise levels from parking activities would be at or below 50 dBA L_{eq} at all surrounding residences. This would be less than the daytime hourly average threshold of 55 dBA L_{eq}. This would be a less-than-significant impact.

Maximum noise levels would be at or below 55 dBA L_{max} at all surrounding residences. This would be less than the daytime and nighttime thresholds of 70 and 65 dBA L_{max}, respectively. This would be a less-than-significant impact.

The proposed parking lot/parking activities would not measurably contribute to ambient noise levels in the area (0 dBA DNL increase). This would be a less-than-significant impact.

TABLE 11 Estimated Parking Lot Noise Levels at Receiving Land Uses

Receptor	Distance from Center of Nearest Parking Area	Hourly L_{eq}		L_{max}		DNL	Noise Level Increase, DNL
		Estimated L_{eq} at Receiving Property Line	55 dBA (Daytime) Exceeded?[a]	Estimated L_{max} at Receiving Property Line	70 dBA (Daytime) or 65 dBA (Nighttime) Exceeded?[a]		
East Residential	100 feet	40 to 50 dBA	No	45 to 55 dBA	No (both)	43 dBA	0 dBA
Northwest Residential	130 feet	33 to 43 dBA[a]	No	38 to 48 dBA[b]	No (both)	36 dBA[b]	0 dBA
Distant South Residential	765 feet	Less than 20 to 22 dBA[b]	No	Less than 20 to 27 dBA[c]	No (both)	Less than 20 dBA[c]	0 dBA
South Office & Commercial	25 feet	52 to 62 dBA	N/A	57 to 67 dBA	N/A	55 dBA	0 dBA

[a] Thresholds apply to residential receptors only.
[b] Minimum attenuation of 5 dB is assumed due to the eight-foot sound wall along the receptors' property lines.
[c] Minimum attenuation of 10 dB is assumed due to intervening buildings.

Project Truck Trips

The proposed project would include two loading docks at Building 1 (north building) and seven loading docks at Building 2 (south building). All loading docks are shown on the interior of the site, between the two proposed buildings. All truck deliveries would be limited to the hours of 7:00 a.m. to 7:00 p.m. According to the traffic study, 100 daily truck trips would access the site. The peak hour truck trips would include 16 trips during the peak AM hour and 11 trips during the peak PM hour. For all remaining hours between 7:00 a.m. and 7:00 p.m., seven to eight truck trips per hour would occur.

Truck delivery noise would include both maneuvering activities occurring at the loading docks and truck parking spaces located between the buildings, as well as truck trips occurring along the driveway.

Trucks maneuvering would generate a combination of engine, exhaust, and tire noise, as well as the intermittent sounds of back-up alarms and releases of compressed air associated with truck/trailer air brakes. Heavy trucks used for incoming deliveries typically generate maximum instantaneous noise levels of 70 to 75 dBA L_{max} at a distance of 50 feet. The noise level of backup alarms can vary depending on the type and directivity of the sound, but maximum noise levels are typically in the range of 65 to 75 dBA L_{max} at a distance of 50 feet. Assuming maneuvering activities for one truck would take up to 10 minutes in a given hour, hourly average noise levels would range from 71 to 74 dBA L_{eq} at 50 feet for seven to 16 truck trips per hour. With only two loading zones at Building 1, no more than 12 truck trips per hour could occur at Building 1, assuming each truck delivery takes up to 10 minutes in a given hour.

Due to the orientation of the buildings, truck loading and unloading activities would be shielded from receptors to the northwest (residences) and to the south (distant residences and office and commercial buildings) of the project site. The residences to the east would have direct exposure to the loading docks at Building 1 and would have some exposure to the loading docks at Building 2. However, the seven loading docks at Building 2 would be mostly shielded by the building. Over 100 feet of building thickness would provide a conservative 10 dBA attenuation for the Building 2 deliveries at the east residential property line. Table 12 summarizes the estimated truck maneuvering noise at the receptors to the east, assuming worst-case conditions, which would include seven to 16 truck trips per hour between 7:00 a.m. and 7:00 p.m.

Hourly average noise levels generated by truck deliveries at Building 2 would range from 43 to 46 dBA L_{eq} and would not exceed the daytime threshold of 55 dBA L_{eq}. Hourly average noise levels generated by truck deliveries at Building 1 would range from 61 to 63 dBA L_{eq}. This would exceed the daytime threshold of 55 dBA L_{eq} at the residences to the east by 6 to 8 dBA. This is a potentially significant impact.

The east residences would be exposed to maximum noise levels up to 60 dBA L_{max} when truck deliveries occur at Building 1 and up to 42 dBA L_{max} when deliveries occur at Building 2. These maximum noise levels would be below the daytime threshold of 70 dBA L_{max}. This would be a less-than-significant impact.

When 100 on-site truck trips occur between 7:00 a.m. and 7:00 p.m. and access Building 1 only (which would represent worst-case conditions), the combined day-night average noise level calculated at the east residential property line would be 58 dBA DNL. The calculated noise level increase compared to the ambient noise environment would be up to 1 dBA DNL. This would be a less-than-significant impact.

TABLE 12 Estimated Truck Delivery Noise Levels at Receiving Land Uses

Receptor	Distance from Center of Truck Loading Docks	Hourly L_{eq}		L_{max}		DNL	Noise Level Increase, DNL
		Estimated L_{eq} at Receiving Property Line	55 dBA (Daytime) Exceeded?[a]	Estimated L_{max} at Receiving Property Line	70 dBA (Daytime) Exceeded?[a]		
East Residential – from deliveries at Building 1	155 feet	61 to 63 dBA	Yes	55 to 60 dBA	No	58 dBA[b]	1 dBA
East Residential – from deliveries at Building 2	390 feet	43 to 46 dBA[b]	No	37 to 42 dBA[b]	No		

[a] Thresholds apply to residential receptors only.

[b] Minimum attenuation of 10 dB is assumed due to Building 2, while no attenuation is assumed for Building 1 deliveries.

To estimate the pass-by noise levels for heavy trucks traveling at speeds of 15 to 25 mph, Federal Highway Administration's Traffic Noise Model (FHWA TNM), version 2.5, was used to model various hourly scenarios for truck traffic, based on the daily trip distribution assumed for the project.

At a distance of 75 feet from the centerline of the driveway, a truck pass-by would generate noise levels ranging from 65 to 67 dBA L_{max}, and hourly average noise levels for seven to 16 truck pass-bys would range from 52 to 56 dBA L_{eq} at a distance of 75 feet when trucks are traveling at a speed of 15 mph. Table 13 summarizes the estimated truck pass-by noise levels at all surrounding receptors, assuming the nearest driveway on the project site, which would represent the worst-case scenario for each of the surrounding receptors.

The maximum noise thresholds and hourly average noise thresholds only apply to stationary sources levels and would not apply to pass-by truck noise. However, the threshold for the permanent noise increase would apply to truck pass-bys. As shown in Table 13, 24-hour truck pass-bys would not measurably contribute to ambient noise levels in the area (0 dBA DNL increase). This is a less-than-significant impact.

TABLE 13 Estimated Truck Pass-by Noise Levels at Receiving Land Uses

Receptor	Distance from Center of Nearest Driveway	Hourly L_{eq}	L_{max}	DNL	Noise Level Increase, DNL
East Residential	65 feet	54 to 57 dBA	66 to 68 dBA	51 dBA	0 dBA
Northwest Residential	150 feet	41 to 45 dBA[a]	54 to 56 dBA[a]	39 dBA[a]	0 dBA
Distant South Residential	110 feet	49 to 53 dBA	61 to 63 dBA	47 dBA	0 dBA
South Office & Commercial	55 feet	55 to 59 dBA	67 to 69 dBA	53 dBA	0 dBA

[a] Minimum attenuation of 5 dB is assumed due to the eight-foot sound wall along the receptors' property lines.

Total Combined Project-Generated Noise

The operational noise levels produced by the proposed project combined (i.e., traffic, mechanical equipment, parking lot, truck loading/unloading activities, and truck pass-bys) would potentially result in a permanent noise increase of 1 dBA DNL or less at existing receptors in the project vicinity, which would be considered a less-than-significant permanent noise level increase.

Operational noise levels would not exceed the City's daytime or nighttime maximum noise level thresholds of 70 and 65 dBA L_{max}, respectively, and parking lot activities would not exceed the City's daytime or nighttime hourly average noise level thresholds of 55 dBA L_{eq} and 45 dBA L_{eq}, respectively. Noise from mechanical equipment would potentially exceed the nighttime threshold at the nearest residential uses to the east. Additionally, the City's daytime hourly average noise level threshold would potentially be exceeded at the nearest residential land uses to the east due to truck deliveries occurring at Building 1. This is a potentially significant impact, that can be reduced to less-than-significant with recommendations set forth below.

Recommended Condition 1b:

The following shall be incorporated into the project as a condition of approval to reduce the impact to a less-than-significant impact:

- Mechanical equipment shall be selected and designed to reduce noise levels to meet City requirements at the nearby noise-sensitive land uses. A qualified acoustical consultant shall be retained to review mechanical noise as these systems are selected to determine specific noise reduction measures necessary to reduce noise to comply with the City's noise level requirements. Noise reduction measures could include, but are not limited to, selection of equipment that emits low noise levels and installation of noise barriers, such as enclosures and parapet walls, to block the line-of-sight between the noise source and the nearest receptors. Other alternate measures may be optimal, such as locating equipment in less noise-sensitive areas (e.g., along the building façades farthest from adjacent neighbors), where feasible.

- Prior to issuance of occupancy, a qualified acoustical consultant shall be retained to review that one or more of the following measures has been incorporated into the project and to verify that daytime noise levels of 55 L_{eq} or below have been achieved at the property line/nearest residential land uses to the east:

    - Redesign Building 1 so the building façade would provide shielding for the eastern residences from the loading docks, similar to the design of Building 2.

    - Implement a no idling policy that requires engines to be turned off after five minutes.

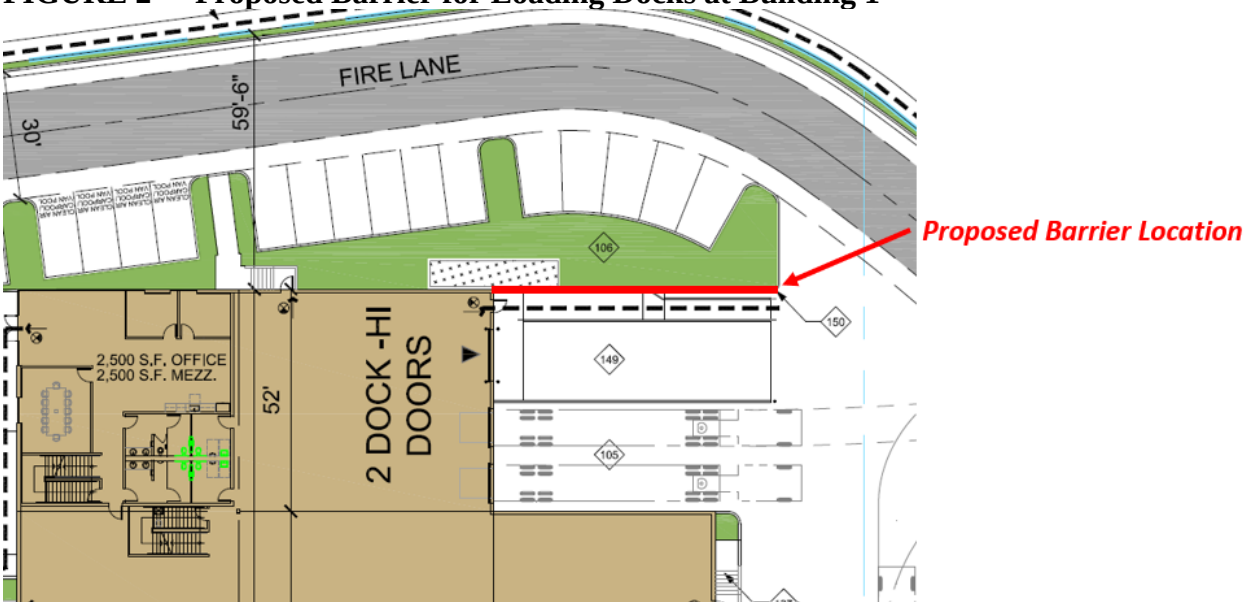
    - Ensure the truck docks are recessed into the ground.

    - Equip loading bay doors with rubberized gasket type seals to allow little loading noise to escape.

- Relocate the loading area at Building 1 to the southwestern corner of the building where increased distance and attenuation from the proposed building façade would reduce noise levels from truck deliveries to below 55 dBA L_{eq} during daytime hours.

- Construct a noise barrier along the eastern boundary of the project site. The proposed barrier would be continuous from grade to top, with no cracks or gaps, and have a minimum surface density of three lbs/ft^2 (e.g., one-inch-thick marine-grade plywood, ½-inch laminated glass, concrete masonry units (CMU)). The minimum height of the barrier shall be 10 feet tall to break the line-of-sight to the noise source. See Figure 2.

FIGURE 2 Proposed Barrier for Loading Docks at Building 1



Impact 2: **Exposure to Excessive Groundborne Vibration.** Construction-related vibration levels could potentially 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 City of Pinole does not define vibration thresholds. For structural damage, the California Department of Transportation 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. A conservative vibration limit of 0.3 in/sec PPV has 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 or buildings that are documented to be structurally weakened, a conservative limit of 0.08 in/sec PPV is often used to provide the highest level of protection. No historical buildings or buildings that are documented to

be structurally weakened adjoin the project site. The 0.3 in/sec PPV vibration limit would be applicable to properties in the immediate vicinity of the project site since there are no known historic buildings in the vicinity.

The vibration limits contained In this policy are conservative and designed to provide the ultimate level of protection for existing buildings. Vibration levels exceeding these thresholds would be capable of cosmetically damaging adjacent buildings but would not be expected to result in minor or major damage. Cosmetic damage (also known as threshold damage) is defined as hairline cracking in plaster, the opening of old cracks, the loosening of paint or the dislodging of loose objects. Minor damage is defined as hairline cracking in masonry or the loosening of plaster. Major structural damage is defined as wide cracking or the shifting of foundation or bearing walls.

Table 14 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 14 also summarizes the distances to the 0.3 in/sec PPV threshold for all buildings.

TABLE 14 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 2023.

Table 15 summarizes the vibration levels at each of the surrounding buildings in the project vicinity. 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. Therefore, the distances used to propagate construction vibration levels (as shown in Table 15), which are different than the distances used to propagate construction noise levels (as shown in Table 8), were estimated under the assumption that each piece of equipment from Table 14 was operating at the nearest construction area on the project site to the nearest receiving building, which would represent the worst-case scenario.

As shown in Table 15, the nearest structure adjoining the project site would be the residential structures to the east and the office and commercial buildings to the south, which are 65 feet or more from the nearest construction work at the project site. At these distances, all buildings would be exposed to vibration levels at or below 0.073 in/sec PPV, which is below the State's 0.3 in/sec PPV threshold. All other buildings in the project vicinity would be exposed to lower vibration levels due to project construction.

Neither cosmetic, minor, or major damage would occur at conventional buildings surrounding the project 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.

TABLE 15 Vibration Levels at Nearest Receptors

Equipment		PPV (in/sec)			
		East Residential (65ft)	Northwest Residential (110ft)	South Distant Residential (765ft)	South Offices & Commercial (65ft)
Clam shovel drop		0.071	0.040	0.005	0.071
Hydromill (slurry wall)	in soil	0.003	0.002	0.0002	0.003
	in rock	0.006	0.003	0.0004	0.006
Vibratory Roller		0.073	0.041	0.005	0.073
Hoe Ram		0.031	0.017	0.002	0.031
Large bulldozer		0.031	0.017	0.002	0.031
Caisson drilling		0.031	0.017	0.002	0.031
Loaded trucks		0.027	0.015	0.002	0.027
Jackhammer		0.012	0.007	0.001	0.012
Small bulldozer		0.001	0.001	0.0001	0.001

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 2023.

In summary, the construction of the project would not generate vibration levels exceeding the State's 0.3 in/sec PPV threshold at conventional buildings surrounding the project site. No potential for this site would generate perceptible vibration levels during daily operations. This would be a less-than-significant impact.

Recommended Condition 2: None required.

Impact 3: **Excessive Aircraft Noise.** The project site is located more than 10 miles from the nearest airports in the area. The noise environment attributable to these aircrafts are considered normally acceptable. This is a **less-than-significant** impact.

The project site is more than 10 miles from San Rafael Airport, Buchanan Field Airport, and Oakland International Airport. Therefore, the project site would lie well outside the 60 dBA CNEL/DNL contour lines for all airports. The proposed project would be compatible with the City's exterior noise standards for aircraft noise. This would be a less-than-significant impact.

Recommended Condition 3: None required.

Cumulative Impacts

Cumulative noise impacts would include temporary construction noise from cumulative construction projects. From the City's website,[3] the following planned or approved projects are located within 1,000 feet of the proposed project:

- **811 San Pablo Avenue (SAHA)** – this project is located approximately 765 feet south of the project and is bound by the residences located south of San Pablo Avenue. This project consists of 33 residential units, which would be 100% affordable housing complex. This project has been approved, but construction has not started. The residential receptors identified in this report as distant residences to the south would have direct exposure to the 811 San Pablo Avenue site but would have minimal exposure to the proposed Pinole Shores project site. These noise-sensitive receptors would be over 500 feet from the Pinole Shores project site, and the noise generated by the 811 San Pablo Avenue site and traffic along San Pablo Avenue dominate these receptors, with the Pinole Shores construction causing minimal disruption. This would not be considered a significant cumulative construction impact.

No other planned or approved projects are located within 1,000 feet of the project site. Therefore, potential cumulative construction impacts would be less-than-significant.

For a substantial permanent cumulative noise increase to occur at operation, two qualifications must be met: 1) if the cumulative plus project traffic volumes result in a noise level increase at sensitive receptors of 5 dBA DNL or greater, with a future noise level of less than 60 dBA DNL, or of 3 dBA DNL or greater, with a future noise level of 60 dBA DNL or greater, compared to existing traffic volumes; and 2) if the cumulative plus project traffic volumes result in a 1 dBA DNL or more noise level increase compared to cumulative (no project) conditions, which would be considered a cumulatively considerable contribution to the overall traffic noise increase.

The traffic study included cumulative and cumulative plus project volumes at two intersections in the vicinity of the project site. Table 16 summarizes the noise level difference calculated by comparing both the cumulative (no project) and cumulative plus project traffic scenarios to the existing scenario. As shown in Table 16, no roadway segments would result in a noise level increase of 3 dBA DNL or more under either cumulative (no project) or cumulative plus project scenarios. Further, the same increase of 2 dBA DNL or less was calculated for both traffic scenarios when compared to the existing volumes. Therefore, the project would not result in cumulative traffic noise increase of 1 dBA DNL or more. There would not be a cumulative noise level increase at project operation.

[3] https://www.ci.pinole.ca.us/city_government/planning/current_projects

TABLE 16 Estimated Noise Level Increases of Cumulative and Cumulative Plus Project Traffic Volumes Over Existing Volumes at Receptors in the Project Vicinity

Roadway	Segment	Estimated Noise Level Increase Over Existing Volumes		Project's Contribution
		Cumulative	Cumulative Plus Project	
Meadow Avenue	South of San Pablo Avenue	0 dBA DNL	0 dBA DNL	0 dBA DNL
Pinon Avenue	North of San Pablo Avenue	1 dBA DNL	1 dBA DNL	0 dBA DNL
Appian Way	South of San Pablo Avenue	2 dBA DNL	2 dBA DNL	0 dBA DNL
San Pablo Avenue	East of Pinon Avenue/Appian Way	2 dBA DNL	2 dBA DNL	0 dBA DNL
	Pinon Avenue/Appian Way to Meadow Avenue	2 dBA DNL	2 dBA DNL	0 dBA DNL
	West of Meadow Avenue	2 dBA DNL	2 dBA DNL	0 dBA DNL

APPENDIX A

FIGURE A1 Daily Trend in Noise Levels for LT-1, Wednesday, October 19, 2022

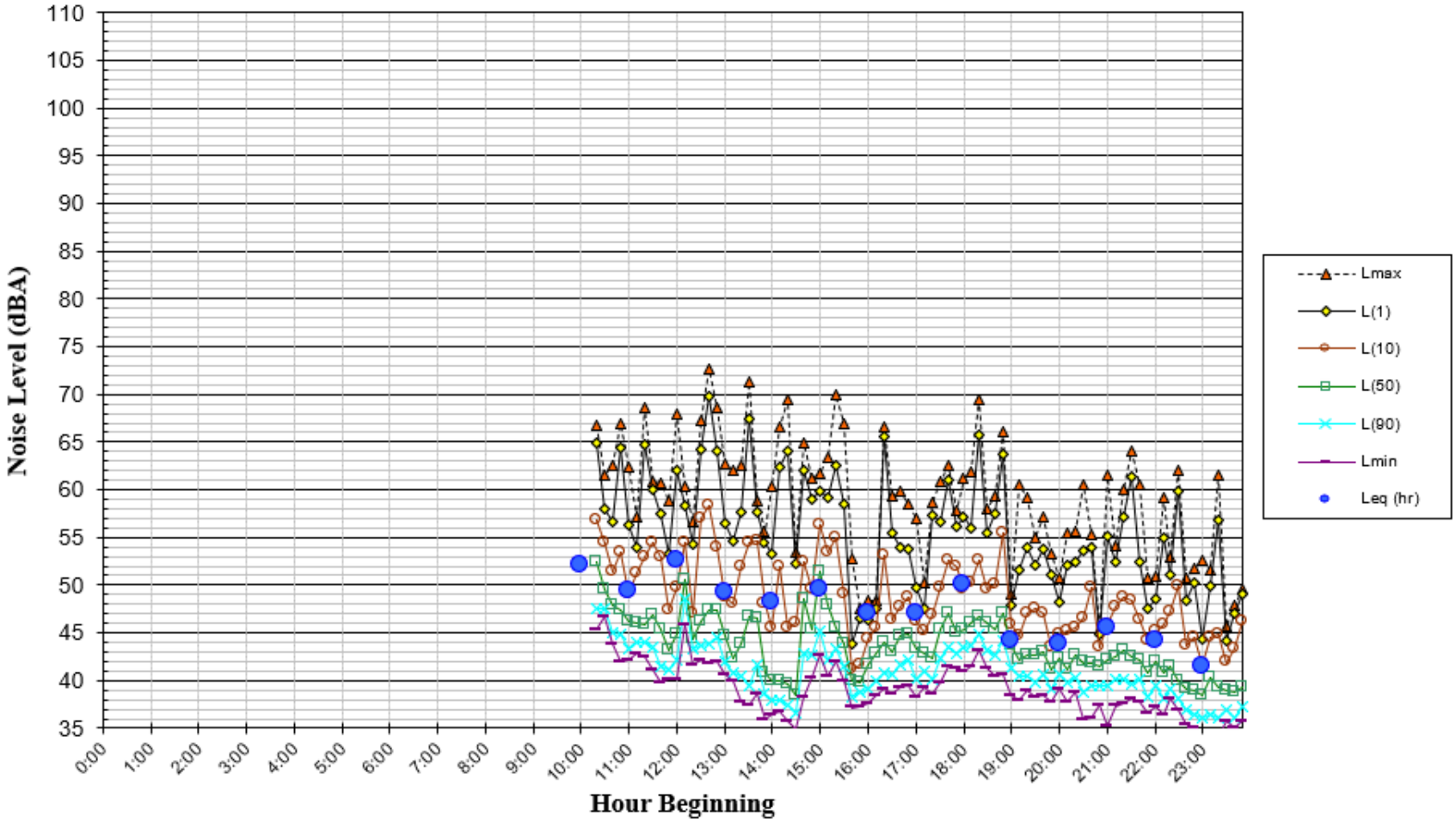


FIGURE A2 Daily Trend in Noise Levels for LT-1, Thursday, October 20, 2022

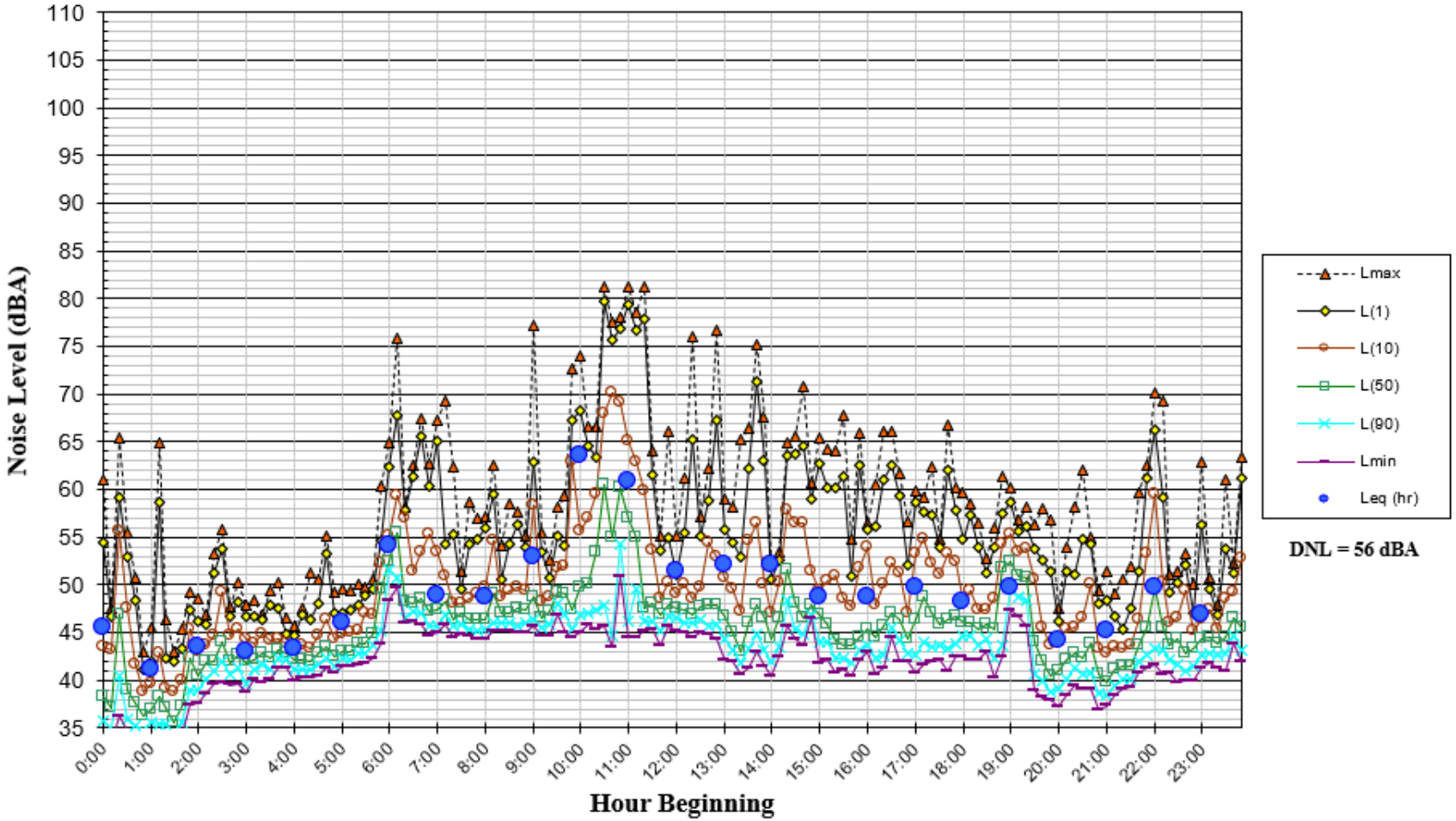


FIGURE A3 Daily Trend in Noise Levels for LT-1, Friday, October 21, 2022

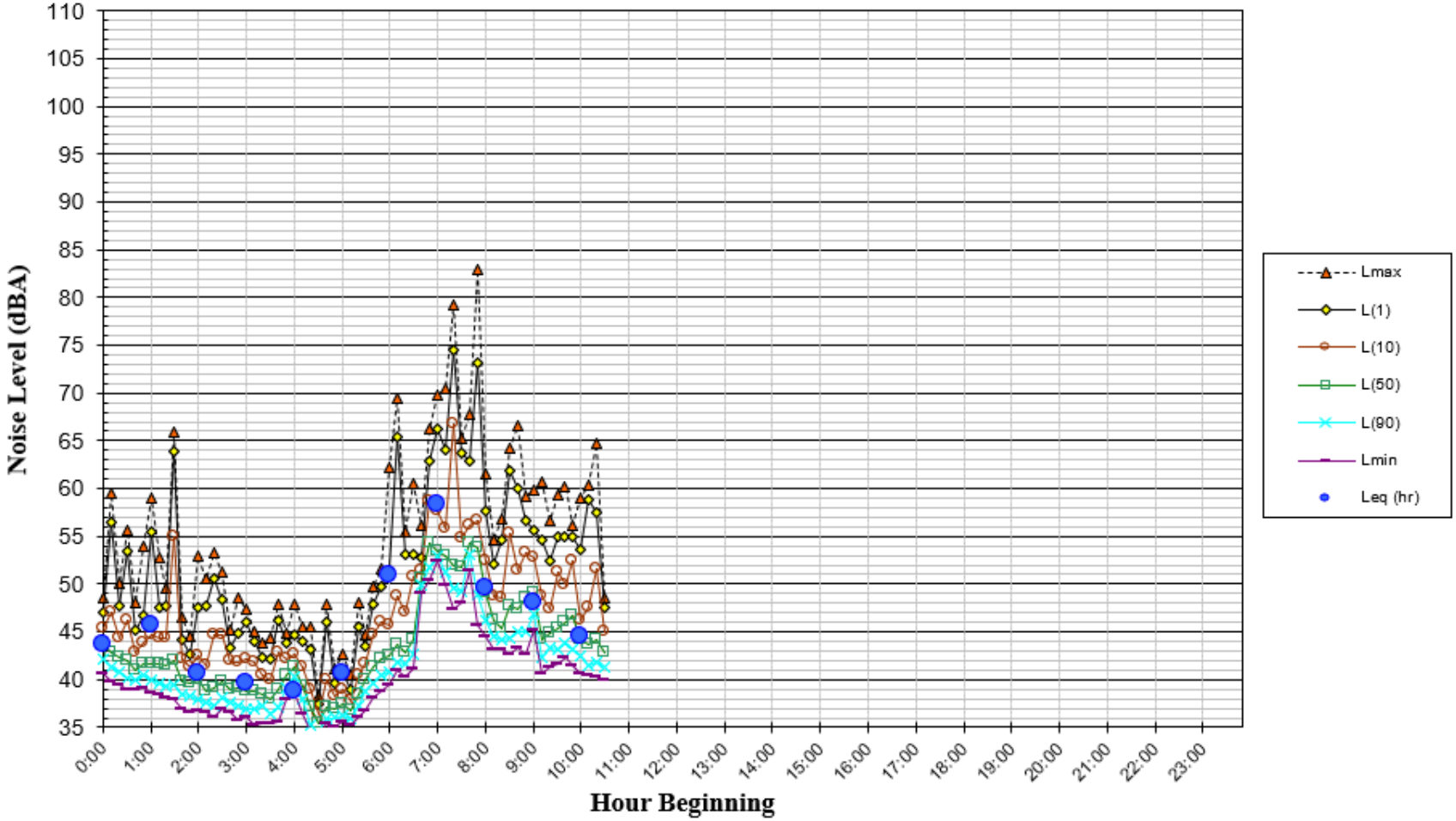


FIGURE A4 Daily Trend in Noise Levels for LT-2, Wednesday, October 19, 2022

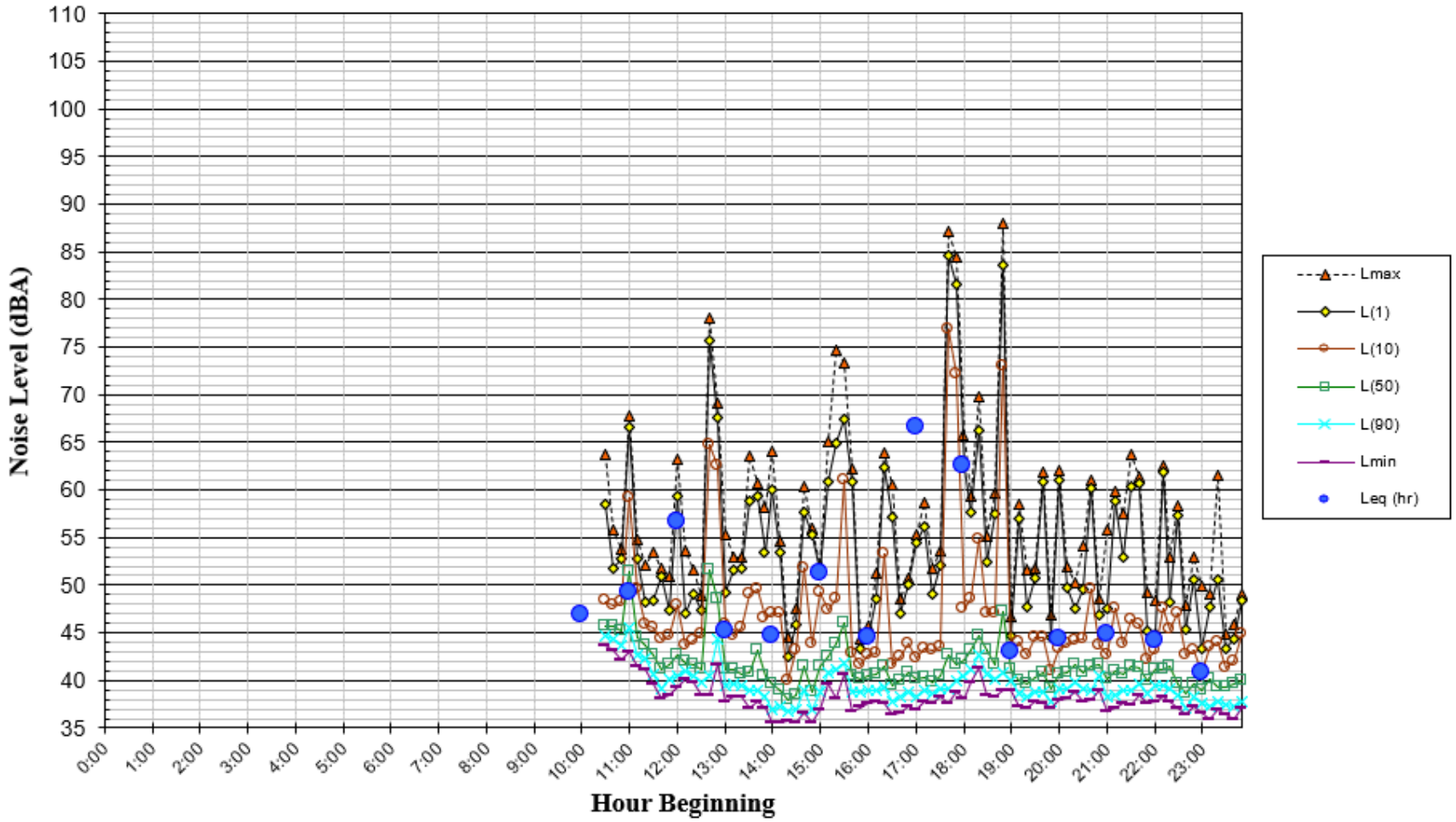


FIGURE A5 Daily Trend in Noise Levels for LT-2, Thursday, October 20, 2022

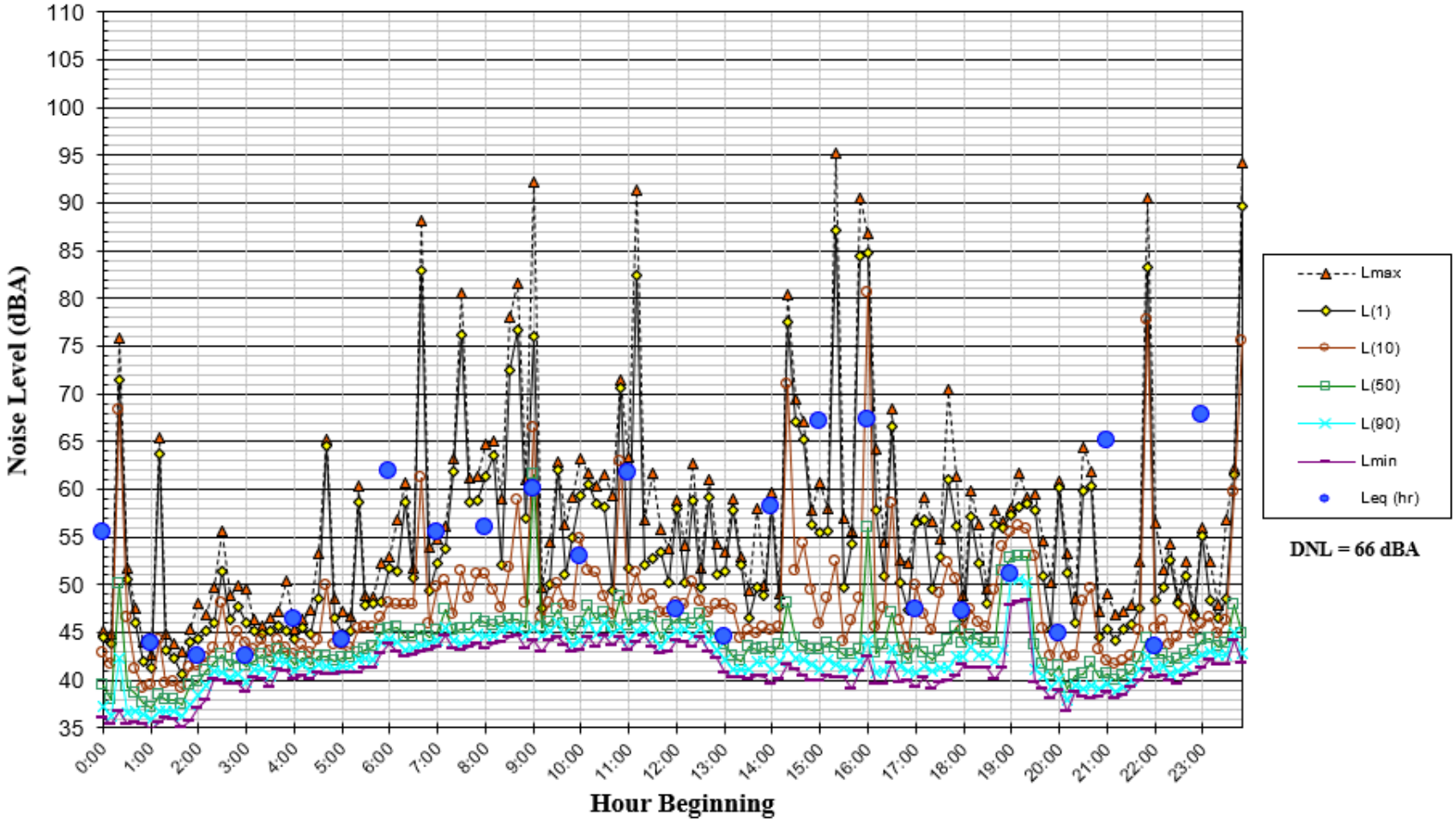


FIGURE A6 Daily Trend in Noise Levels for LT-2, Friday, October 21, 2022