EMORY STREET TOWNHOMES RESIDENTIAL PROJECT NOISE AND VIBRATION ASSESSMENT

San José, California

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INTRODUCTION

The project proposes the construction of 18 three-story townhomes on the 0.99-acre project site located north of The Alameda/Emory Street intersection in San José, California. Currently, the site is vacant.

This report summarizes the evaluation of the project's potential to result in significant noise and vibration 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 levels at the site in terms of 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 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 that are used to describe noise in a particular location. A *decibel (dB)* is a unit of measurement that 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 tenfold 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.

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 and 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 sounds 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.

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 on 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 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* (*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.[1] 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.

[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.

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 and 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.[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 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.

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

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.

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 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 of 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 vibrations, 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, Santa Clara County, and the City of San José. 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 limits daytime construction noise to 80 dBA L_{eq} at residential land uses, 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. The current version of the California Building Code (CBC) requires interior noise levels in multi-family residential units attributable to exterior environmental noise sources to be limited to a level not exceeding 45 dBA DNL/CNEL in any habitable room.

Santa Clara County

Santa Clara County Airport Land Use Commission Comprehensive Land Use Plan. The Comprehensive Land Use Plan (CLUP) adopted by the Santa Clara County Airport Land Use Commission contains standards for projects within the vicinity of San José Mineta International Airport, which are relevant to this project:

4.3.2.1 Noise Compatibility Policies

N-1 The Community Noise Equivalent Level (CNEL) method of representing noise levels shall be used to determine if a specific land use is consistent with the CLUP.

N-2 In addition to the other guidelines and policies herein, the Noise Compatibility Guidelines/Policies presented in Table 4-1 shall be used to determine if a specific land use is consistent with this CLUP.

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

Table 4 - 1

NOISE COMPATIBILITY POLICIES

LAND USE CATEGORY	CNEL					
	55-60	60-65	65-70	70-75	75-80	80-85
Residential – low density Single-family, duplex, mobile homes	*	**	***	****	****	****
Residential – multi-family, condominiums, townhouses	*	**	***	****	****	****
Transient lodging - motels, hotels	*	*	**	****	****	****
Schools, libraries, indoor religious assemblies, hospitals, nursing homes	*	***	****	****	****	****
Auditoriums, concert halls, amphitheaters	*	***	***	****	****	****
Sports arena, outdoor spectator sports, parking	*	*	*	**	***	****
Playgrounds, neighborhood parks	*	*	***	****	****	****
Golf courses, riding stables, water recreation, cemeteries	*	*	*	**	***	****
Office buildings, business commercial and professional, retail	*	*	**	***	****	****
Industrial, manufacturing, utilities, agriculture	*	*	*	***	***	****
* Generally Acceptable	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements. Mobile homes may not be acceptable in these areas. Some outdoor activities might be adversely affected.					
** Conditionally Acceptable	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Outdoor activities may be adversely affected. Residential: Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.					
*** Generally Unacceptable	New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design. Outdoor activities are likely to be adversely affected.					
**** Unacceptable	New construction or development shall not be undertaken.					

Source: Based on General Plan Guidelines, Appendix C (2003), Figure 2 and Santa Clara County ALUC 1992 Land Use Plan, Table 1

Source: Comprehensive Land Use Plan, Santa Clara County, Norman Y Mineta San José International Airport, May 25, 2011, Amended May 23, 2019.

N-3 Noise impacts shall be evaluated according to the Aircraft Noise Contours presented on Figure 5 (not shown in this report).

N-4 No residential construction shall be permitted within the 65 dB CNEL contour boundary unless it can be demonstrated that the resulting interior sound levels will be less than 45 dB CNEL and there are no outdoor patios or outdoor activity areas associated with the residential project. All property owners within the 65 dB CNEL contour boundary who rent or lease their property for residential use shall include in their rental/lease agreement with the tenant, a statement advising that they (the tenants) are living within a high noise area and the exterior noise level is predicted to be greater than 65 dB CNEL.

N-5 Residential construction will not be permitted in the area between the 60 dB CNEL contour boundary and the 65 dB CNEL contour boundary unless it can be demonstrated that the resulting interior sound level will be no greater than 45 dB CNEL.

City of San José

City of San José General Plan. The Environmental Leadership Chapter in the Envision San José 2040 General Plan sets forth policies with the goal of minimizing the impact of noise on people through noise reduction and suppression techniques, and through appropriate land use policies in the City of San José. The following policies are applicable to the proposed project:

EC-1.1 Locate new development in areas where noise levels are appropriate for the proposed uses. Consider federal, state, and City noise standards and guidelines as a part of new development review. Applicable standards and guidelines for land uses in San José include:

Interior Noise Levels

- The City's standard for interior noise levels in residences, hotels, motels, residential care facilities, and hospitals is 45 dBA DNL. Include appropriate site and building design, building construction and noise attenuation techniques in new development to meet this standard. For sites with exterior noise levels of 60 dBA DNL or more, an acoustical analysis following protocols in the City-adopted California Building Code is required to demonstrate that development projects can meet this standard. The acoustical analysis shall base required noise attenuation techniques on expected *Envision General Plan* traffic volumes to ensure land use compatibility and General Plan consistency over the life of this plan.

Exterior Noise Levels

- The City's acceptable exterior noise level objective is 60 dBA DNL or less for residential and most institutional land uses (Table EC-1). The acceptable exterior noise level objective is established for the City, except in the environs of the San José International Airport and the Downtown, as described below:

- For new multi-family residential projects and for the residential component of mixed-use development, use a standard of 60 dBA DNL in usable outdoor activity areas, excluding balconies and residential stoops and porches facing existing roadways. Some common use areas that meet the 60 dBA DNL exterior standard will be available to all residents. Use noise attenuation techniques such as shielding by buildings and structures for outdoor common use areas. On sites subject to aircraft overflights or adjacent to elevated roadways, use noise attenuation techniques to achieve the 60 dBA DNL standard for noise from sources other than aircraft and elevated roadway segments.

Table EC-1: Land Use Compatibility Guidelines for Community Noise in San José

LAND USE CATEGORY	EXTERIOR NOISE EXPOSURE (DNL IN DECIBELS (DBA)) 55	60	65	70	75	80
1. Residential, Hotels and Motels, Hospitals and Residential Care[1]						
2. Outdoor Sports and Recreation, Neighborhood Parks and Playgrounds						
3. Schools, Libraries, Museums, Meeting Halls, Churches						
4. Office Buildings, Business Commercial, and Professional Offices						
5. Sports Arena, Outdoor Spectator Sports						
6. Public and Quasi-Public Auditoriums, Concert Halls, Amphitheaters						

[1]Noise mitigation to reduce interior noise levels pursuant to Policy EC-1.1 is required.

Normally Acceptable:

- Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

Conditionally Acceptable:

- Specified land use may be permitted only after detailed analysis of the noise reduction requirements and needed noise insulation features included in the design.

Unacceptable:

- New construction or development should generally not be undertaken because mitigation is usually not feasible to comply with noise element policies.

Source: Envision San José 2040 General Plan, Adopted November 1, 2011, As Amended on May 16, 2019.

EC-1.2 Minimize the noise impacts of new development on land uses sensitive to increased noise levels (Categories 1, 2, 3 and 6) by limiting noise generation and by requiring use of noise attenuation measures such as acoustical enclosures and sound barriers, where feasible. The City considers significant noise impacts to occur if a project would:

- Cause the DNL at noise sensitive receptors to increase by five dBA DNL or more where the noise levels would remain "Normally Acceptable" or

- Cause the DNL at noise sensitive receptors to increase by three dBA DNL or more where noise levels would equal or exceed the "Normally Acceptable" level.

EC-1.7 Require construction operations within San José to use best available noise suppression devices and techniques and limit construction hours near residential uses per the City's Municipal Code. The City considers significant construction noise impacts to occur if a project located within 500 feet of residential uses or 200 feet of commercial or office uses would:

- Involve substantial noise generating activities (such as building demolition, grading, excavation, pile driving, use of impact equipment, or building framing) continuing for more than 12 months.

For such large or complex projects, a construction noise logistics plan that specifies hours of construction, noise and vibration minimization measures, posting or notification of construction schedules, and designation of a noise disturbance coordinator who would respond to neighborhood complaints will be required to be in place prior to the start of construction and implemented during construction to reduce noise impacts on neighboring residents and other uses.

Regulatory Background – Vibration

City of San José

City of San José General Plan. The Environmental Leadership Chapter in the Envision San José 2040 General Plan sets forth policies to achieve the goal of minimizing vibration impacts on people, residences, and business operations in the City of San José. The following policies are applicable to the proposed project:

EC-2.3 Require new development to minimize continuous vibration impacts to adjacent uses during demolition and construction. For sensitive historic structures, including ruins and ancient monuments or building that are documented to be structurally weakened, a continuous vibration limit of 0.08 in/sec PPV (peak particle velocity) will be used to minimize the potential for cosmetic damage to a building. A continuous vibration limit of 0.20 in/sec PPV will be used to minimize the potential for cosmetic damage at buildings of normal conventional construction. Equipment or activities typical of generating continuous vibration include but are not limited to: excavation equipment; static compaction equipment; vibratory pile drivers; pile-extraction equipment; and vibratory compaction equipment. Avoid use of impact pile drivers within 125 feet of any buildings, and within 300 feet of historical buildings, or buildings in poor condition. On a project-specific basis, this distance of 300 feet may be reduced where warranted by a technical study by a qualified professional that verifies that there will be virtually no risk of cosmetic damage to sensitive buildings from the new development during demolition and construction. Transient vibration impacts may exceed a vibration limit of 0.08 in/sec PPV only when and where warranted by a technical study by a qualified professional that

verifies that there will be virtually no risk of cosmetic damage to sensitive buildings from the new development during demolition and construction.

Existing Noise Environment

The project site is located north of The Alameda/Emory Street intersection in the City of San José. The site is bounded by The Alameda to southwest, Emory Street to the southeast, existing commercial and residential uses to the northwest, and an existing community center to the northeast. An office building and residential uses are located across Emory Street, and the First Church-Christ Scientist Church is also located across The Alameda. Additionally, the Temple Emanu-El is located north of the project site.

The noise environment at the site and in the surrounding area results primarily from local vehicular traffic along The Alameda. Local traffic along Emory Street and intermittent aircraft associated with San José Mineta International Airport also contribute to the noise environment.

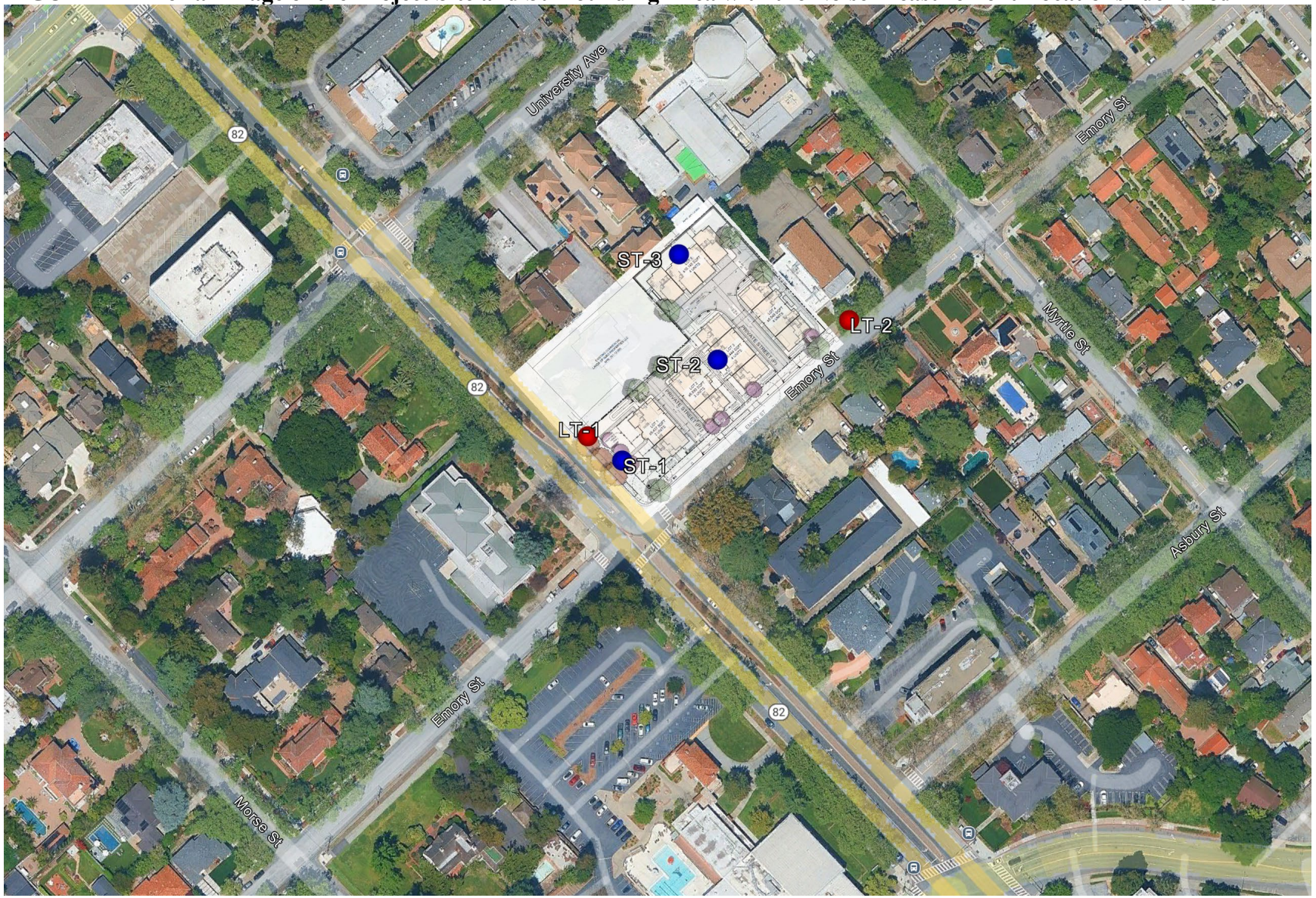
A noise monitoring survey consisting of two long-term (LT-1 and LT-2) and three short-term (ST-1 through ST-3) noise measurements was made between Wednesday, October 29, 2025, and Friday, October 31, 2025. All measurement locations are shown in Figure 1.

Long-term noise measurement LT-1 was made approximately 45 feet from the centerline of The Alameda. Hourly average noise levels at LT-1 typically ranged from 68 to 72 dBA L_{eq} during daytime hours (7:00 a.m. and 10:00 p.m.) and from 61 to 69 dBA L_{eq} during nighttime hours (10:00 p.m. and 7:00 a.m.). The day-night average noise level on Thursday, October 30, 2025, was 73 dBA DNL. The daily trends in noise levels at LT-1 are shown in Figures A1 - A3 of Appendix A.

LT-2 was made approximately 20 feet from the centerline of Emory Street. Hourly average noise levels at LT-2 typically ranged from 54 to 68 dBA L_{eq} during daytime hours and from 46 to 58 dBA L_{eq} during nighttime hours. The day-night average noise level on Thursday, October 30, 2025, was 62 dBA DNL. The daily trends in noise levels at LT-2 are shown in Figures A4 - A6 of Appendix A.

Short-term noise measurements were made on Wednesday, October 29, 2025, between 10:50 a.m. and 11:10 a.m. in two consecutive 10-minute measurement periods. Table 4 summarizes the noise measurement results at each location.

FIGURE 1 Aerial Image of the Project Site and Surrounding Area with the Noise Measurement Locations Identified



Source: Google Earth, 2025.

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: ~45 feet from The Alameda centerline	10/29/2025, 10:50-11:00	76	74	71	65	56	67
	10/29/2025, 11:00-11:10	76	75	72	66	52	68
ST-2: ~230 feet from The Alameda centerline & ~95 feet from the Emory Street centerline	10/29/2025, 10:50-11:00	57	56	54	51	46	51
	10/29/2025, 11:00-11:10	63	60	56	52	45	53
ST-3: ~285 feet from The Alameda centerline & ~225 feet from the Emory Street centerline	10/29/2025, 10:50-11:00	57	54	49	45	42	47
	10/29/2025, 11:00-11:10	55	53	50	46	42	47

The short-term measurements were made simultaneously, with ST-1 being attended and ST-2 and ST-3 being unattended. ST-1 was made along The Alameda, approximately 45 feet from the centerline. ST-2 was made near the center of the site, set back approximately 230 feet from the centerline of The Alameda and approximately 95 feet from the centerline of Emory Street. ST-3 was made near the rear of the project site, approximately 285 feet from the centerline of The Alameda and approximately 225 feet from the centerline of Emory Street. At ST-1, traffic along The Alameda, the dominant noise source at all short-term measurement locations, consisted of passenger cars (58 to 76 dBA), buses (67 to 74 dBA), and heavy trucks (71 to 76 dBA). The 10-minute L_{eqs} ranged from 67 to 68 dBA at ST-1, from 51 to 53 dBA at ST-2, and were 47 dBA at ST-3.

PLAN CONSISTENCY ANALYSIS

Noise and Land Use Compatibility

The Environmental Leadership Chapter in the Envision San José 2040 General Plan sets forth policies with the goal of minimizing the impact of noise on people through noise reduction and suppression techniques and through appropriate land use policies in the City of San José. The applicable General Plan policies were presented in detail in the Regulatory Background section and are summarized below for the proposed project:

- The City's acceptable exterior noise level standard is 60 dBA DNL or less for the proposed residential land uses.

- The City's acceptable interior noise level standard is 45 dBA DNL or less for the proposed residential land uses.

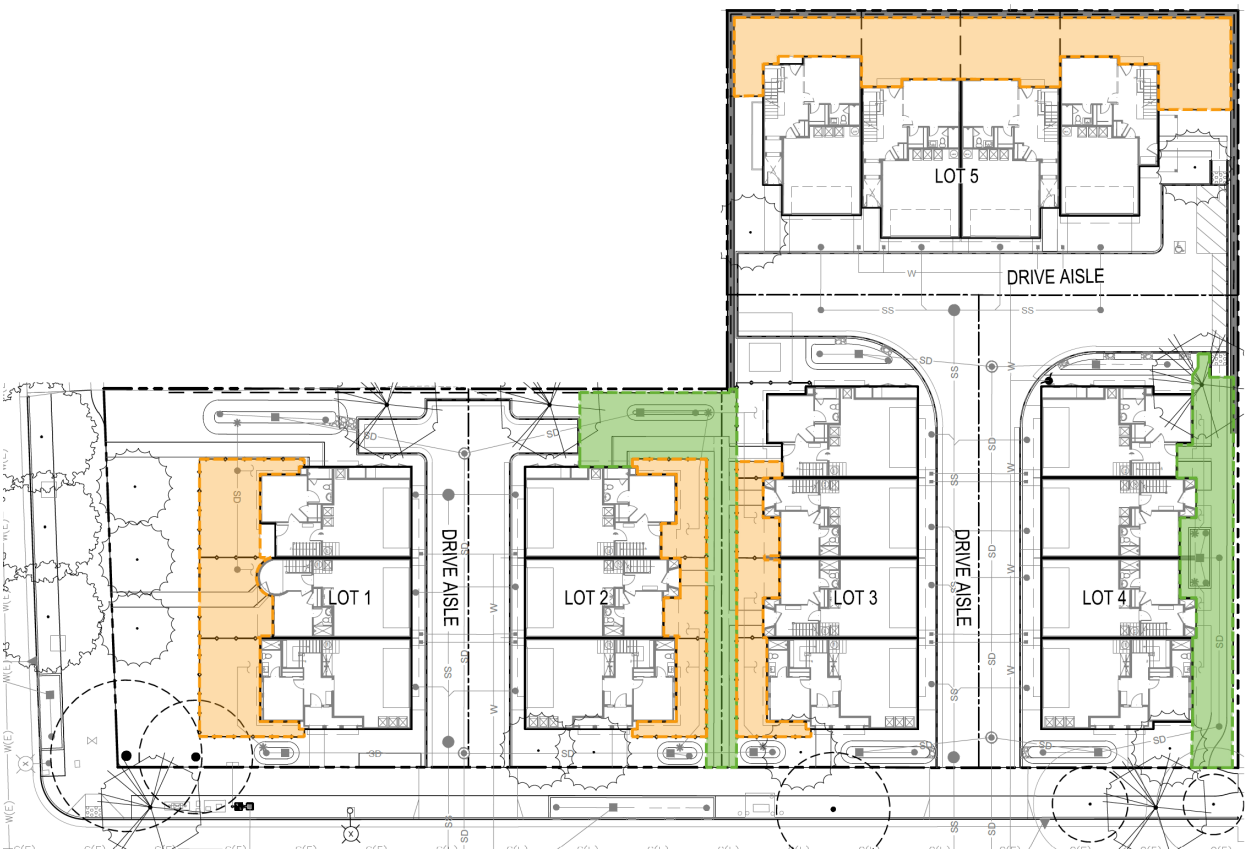
The future noise environment at the site would continue to result primarily from vehicular traffic along The Alameda. While a full traffic study was not required for the proposed project, worst-case peak hour trips of 8 during the peak AM and PM hours[4] would be generated by the proposed project. However, compared to the existing peak hour traffic volumes along The Alameda, these peak hour trips would not result in a measurable noise level increase (i.e., 0 dBA DNL increase).

To estimate the future permanent noise level increase, a 1% to 2% traffic increase per year through 2045 was assumed, which is typical for built-out areas. Based on this assumption, the noise level increase by the year 2045 was calculated to be 2 dBA DNL above existing conditions. This noise level increase was applied throughout the project site to represent worst-case conditions.

Future Exterior Noise Environment

The site plan in Figure 2 shows two common-use outdoor areas (identified by green in Figure 2) and private outdoor use areas adjoining the residential units in Lots 1, 2, 3, and 5 (identified by orange in Figure 2).

FIGURE 2 Site Plan Showing Outdoor Use Areas



The centers of the private outdoor areas to the west of the Lot 1 units would be set back approximately 85 feet from the centerline of The Alameda and approximately 50 to 100 feet from

[4] These peak hour trips are based on a 19-unit development. While the peak hour trips may reduce under the current project conditions of 18 total units, this would represent the worst-case scenario.

the centerline of Emory Street. At these distances, future exterior noise levels would be up to 72 dBA DNL, assuming partial shielding from existing and proposed buildings and the six-foot good neighbor fence surrounding the site.

The common outdoor use area north of Lot 2 units would be mostly shielded from traffic noise along Emory Street but would have direct line-of-sight The Alameda, with the center set back approximately 200 feet from the centerline. At this distance and assuming partial shielding from surrounding buildings and the good neighbor fence, future exterior noise levels would be up to 59 dBA DNL.

The common outdoor use area between Lots 2 and 3 and the private outdoor areas between Lots 2 and 3 would be mostly shielded from The Alameda but would have direct line-of-sight to Emory Street, with the centers of the private outdoor areas set back approximately 50 to 100 feet from the centerline. Assuming partial shielding from the surrounding buildings and the good neighbor fence, future exterior noise levels would be up to 59 dBA DNL.

The center of the common outdoor use area east of Lot 4 would be set back approximately 90 feet from the centerline of Emory Street. Assuming partial shielding from the surrounding buildings and the good neighbor fence, future exterior noise levels would be up to 50 dBA DNL.

The private outdoor use areas at Lot 5, which face the existing residential and commercial uses to the north, would have setbacks ranging from approximately 240 to 335 feet from the centerline of The Alameda and would be mostly shielded from the traffic noise along Emory Street. Assuming partial shielding from the surrounding buildings and the good neighbor fence, future exterior noise levels would be up to 56 dBA DNL.

Both common use outdoor areas and the private outdoor spaces at Lots 2, 3, and 5 proposed as part of the project would be compatible with the future noise environment at the site. However, the private outdoor spaces at Lot 1 would exceed the City's normally acceptable threshold of 60 dBA DNL by up to 12 dBA DNL.

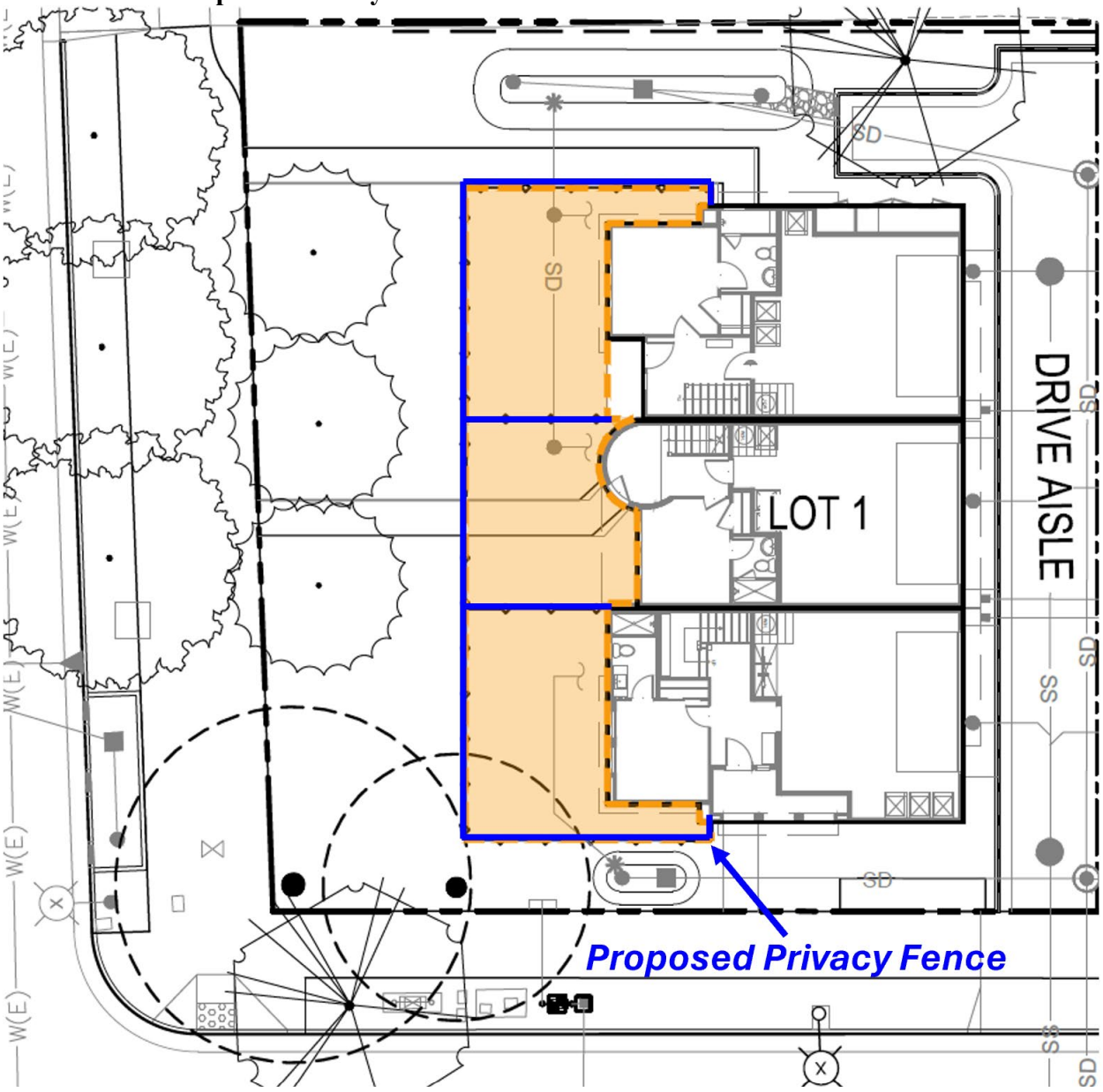
Recommended Noise Control Features to Reduce Future Exterior Noise Levels

Methods available to reduce exterior noise levels in outdoor use areas include site planning alternatives (e.g., increased setbacks and using the proposed buildings as noise barriers), the construction of traditional noise barriers or earth berms, or a combination of the above. The optimal noise control features would be a privacy fence surrounding the private outdoor spaces of Lot 1, as shown in Figure 3. The recommended privacy fence 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 nominal thickness wood fence boards, concrete, or masonry block).

To maintain the aesthetic appeal with the six-foot good neighbor fence surrounding the site, privacy fences of six feet tall would reduce future exterior noise levels at the Lot 1 private outdoor use areas to 65 dBA DNL. While this would not achieve the City's normally acceptable noise limit of 60 dBA DNL, this would fall within the conditionally acceptable noise limit range. The City

could allow 65 dBA DNL at the private outdoor use areas at Lot 1 on a conditionally acceptable basis.

FIGURE 3 Proposed Privacy Fence Locations at Lot 1



The final recommendations for noise control features shall be confirmed by a qualified acoustics consultant when detailed site plans and grading plans are available.

Future Interior Noise Environment

Standard residential construction provides approximately 15 dBA of exterior-to-interior noise reduction, assuming the windows are partially open for ventilation. Standard construction with the windows closed provides approximately 20 to 25 dBA of noise reduction in interior spaces. Where

exterior noise levels range from 60 to 65 dBA DNL, the inclusion of adequate forced-air mechanical ventilation is often the method selected to reduce interior noise levels to acceptable levels by closing the windows to control noise. Where noise levels exceed 65 dBA DNL, forced-air mechanical ventilation systems and sound-rated construction methods are normally required. Such methods or materials may include a combination of smaller window and door sizes as a percentage of the total building façade facing the noise source, sound-rated windows and doors, sound rated exterior wall assemblies, and mechanical ventilation so windows may be kept closed at the occupant's discretion.

The western façades of Lot 1 townhomes facing The Alameda would be set back from the centerline by approximately 95 feet. At this distance, rooms in the Lot 1 townhome units facing The Alameda would be exposed to future exterior noise levels up to 70 dBA DNL. Assuming windows to be partially open, future interior noise levels in these units would be up to 55 dBA DNL.

The southern façades of Lots 1 through 4 townhomes face Emory Street, with setbacks of approximately 40 feet from the centerline. At this distance, the rooms located along the southern façades of these buildings would be exposed to future exterior noise levels of 61 dBA DNL. Assuming windows to be partially open, future interior noise levels in these units would be 46 dBA DNL.

Units in Lot 5 would be set back from the centerline of The Alameda by approximately 235 to 340 feet and from the centerline of Emory Street by approximately 180 to 235 feet. These units would be exposed to future exterior noise levels at or below 60 dBA DNL. Assuming windows to be partially open, future interior noise levels in these units would be at or below 45 dBA DNL.

To meet the interior noise requirements set forth by the City of San José of 45 dBA DNL, implementation of noise insulation features would be required.

Recommended Noise Insulation Features to Reduce Future Interior Noise Levels

The following noise insulation features shall be incorporated into the proposed project to reduce interior noise levels to 45 dBA DNL or less at residential interiors:

- Provide a suitable form of forced-air mechanical ventilation, as determined by the local building official, for all residential units at the project site so that windows can be kept closed at the occupant's discretion to control interior noise and achieve the interior noise standards.

- Lot 1 townhomes facing The Alameda would require sound-rated windows within minimum STC ratings of 31 and adequate forced-air mechanical ventilation to meet the interior noise threshold of 45 dBA DNL.

- All remaining townhomes would meet the interior threshold of 45 dBA DNL with adequate forced-air mechanical ventilation and standard construction materials.

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 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.** Construction of the proposed project would expose existing residential land uses located within 500 feet of the project site to a temporary increase in noise levels for a period of exceeding one year. With the incorporation of the City's Standard Permit Condition as a project condition of approval, this would be a **less-than-significant** impact.

The construction schedule assumed that the earliest possible start date would be early January 2027, and the project is expected to be completed by mid-June 2028 (approximate 18-month period). Construction phases would include site preparation, grading/excavation, trenching/foundation, building exterior, 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.

Policy EC-1.7 of the City's General Plan requires that all construction operations within the City to use best available noise suppression devices and techniques and to limit construction hours near residential uses per the Municipal Code allowable hours, which are between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday when construction occurs within 500 feet of a residential

land use. Further, the City considers significant construction noise impacts to occur if a project that is located within 500 feet of residential uses or 200 feet of commercial or office uses would involve substantial noise-generating activities (such as building demolition, grading, excavation, pile driving, use of impact equipment, or building framing) continuing for more than 12 months.

The City of San José does not establish noise level thresholds for construction activities. The FTA thresholds are used in this analysis to establish acceptable noise levels for temporary construction work. The FTA identifies construction noise limits in the *Transit Noise and Vibration Impact Assessment Manual*.[5] During daytime hours, an exterior threshold of 80 dBA L_{eq} shall be enforced at residential land uses and 85 dBA L_{eq} shall be enforced at commercial and office uses.

Construction activities generate considerable amounts of noise, especially during earth-moving activities when heavy equipment is used. The hauling of excavated materials and construction materials would generate truck trips on local roadways, as well. For the proposed project, pile driving, which generates excessive noise levels, is not expected. 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 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

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

Equipment Category	L_{max} Level (dBA)[1,2]	Impact/Continuous
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 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 65 to 88 dBA L_{eq} for residential buildings, measured at a distance of 50 feet from the center of a 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 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.

Equipment expected to be used in each construction stage 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 Construction Noise Levels for the Proposed Project at a Distance of 50 feet

Phase of Construction	Total Number of Workdays	Construction Equipment (Quantity)	Estimated Construction Noise Level at 50 feet, dBA L_{eq}
Site Preparation	3	Grader (1)[a] Rubber-Tired Dozer (1) Tractor/Loader/Backhoe (1)[a]	84
Grading/Excavation	7	Grader (1)[a] Rubber-Tired Dozer (1) Tractor/Loader/Backhoe (2)[a]	84
Trenching/ Foundation	7	Tractor/Loader/Backhoe (1)[a] Excavator (1)[a]	82
Building – Exterior	328	Crane (1) Forklift (1) Generator Set (1)[a] Tractor/Loader/Backhoe (1)[a] Welder (3)	82
Building – Interior/ Architectural Coating	16	Air Compressor (1)[a]	74
Paving	16	Cement & Mortar Mixer (1) Paver (1) Paving Equipment (1)[a] Roller (1) Tractor/Loader/Backhoe (1)[a]	84

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

To assess construction noise impacts at the receiving property lines of existing noise-sensitive receptors, the worst-case hourly average noise level, which is calculated by combining all pieces of equipment per phase, was propagated from the site's geometric center to the nearest property lines of the surrounding land uses. These noise level estimates are shown in Table 8. The noise levels in Table 8 do not account for reductions due to intervening buildings or existing barriers.

TABLE 8 Construction Noise Levels for the Proposed Project at the Receiving Property Lines in the Project Vicinity

Phase of Construction	Calculated Hourly Average Noise Levels, L_{eq} (dBA)					
	NW Comm. Uses (60ft)	North Res. & Comm. Uses (150ft)	East Community Center (100ft)	South Res. & Offices (120ft)	West Church (315ft)	NE Church (180ft)
Site Preparation	82	75	79	77	69	73
Grading/Excavation	82	76	80	78	70	75
Trenching/Foundation	80	72	76	74	66	71
Building – Exterior	80	74	77	76	67	72
Building – Interior/ Architectural Coating	72	64	68	66	58	63
Paving	83	76	80	78	70	74

As shown in Tables 7 and 8, construction noise levels would intermittently range from 72 to 84 dBA L_{eq} when activities occur 50 to 60 feet from nearby receptors. When focused near the center of the project site, construction noise levels would typically range from 64 to 78 dBA L_{eq} at the surrounding residential land uses, from 64 to 83 dBA L_{eq} at the surrounding commercial uses and offices, and from 58 to 75 dBA L_{eq} at the surrounding churches.

The project site is located within 500 feet of existing residential uses and within 200 feet of existing nonresidential uses. Since total project construction is expected to last for a period of more than one year, the City of San José's Standard Permit Conditions for Construction-Related Noise, which provides a list of noise minimization measures to be incorporated into construction projects within the City, would be incorporated into the proposed project as a condition of approval. These measures include, but are not limited to, the following:

- Limit construction to the hours of 7:00 a.m. to 7:00 p.m. Monday through Friday for any on-site or off-site work within 500 feet of any residential unit. Construction outside of these hours may be approved through a development permit based on a site-specific "construction noise mitigation plan" and a finding by the Director of Planning, Building and Code Enforcement that the construction noise mitigation plan is adequate to prevent noise disturbance of affected residential uses.

- Construct solid plywood fences around ground-level construction sites adjacent to operational businesses, residences, or other noise-sensitive land uses.

- 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.

- Control noise from construction workers' radios to a point where they are not audible at existing residences bordering the project site.

- Notify all adjacent businesses, 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.

- If complaints are received or excessive noise levels cannot be reduced using the measures above, erect a temporary noise control blanket barrier along the surrounding building facades that face the construction sites.

- 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.

Implementation of the above Standard Permit Condition measures as project conditions of approval would reduce construction noise levels emanating from the site, limit construction hours, and minimize disruption and annoyance. With the implementation of these measures and recognizing that noise generated by construction activities would occur over a temporary period, the impact would be less-than-significant.

Mitigation Measure 1a: No further mitigation required.

Impact 1b: Permanent Noise Level Increase/Exceed Applicable Standards. The proposed project would not result in a substantial permanent noise level increase at receptors in the project vicinity. Operational noise levels generated by the proposed project would not exceed General Plan thresholds. This is a **less-than-significant** impact.

According to Policy EC-1.2 of the City's General Plan, a significant permanent noise increase would occur if the project were to increase noise levels at noise-sensitive receptors by 3 dBA DNL or more, where ambient noise levels exceed the "normally acceptable" noise level standard. Where ambient noise levels are at or below the "normally acceptable" noise level standard, noise level increases of 5 dBA DNL or more would be considered significant. The City's General Plan defines the "normally acceptable" outdoor noise level standard for the nearby residential land uses to be 60 dBA DNL. Existing ambient levels, based on the measurements made in the project vicinity, exceed 60 dBA DNL.

While the City's Noise Element does not include thresholds for proposed residential uses, the City's Municipal Code has noise limits of 55 dBA at receiving residential uses and 60 dBA at receiving commercial uses. Exceeding these limits would not be considered a significant impact under CEQA; however, it is recommended that these limits be considered for design features in the proposed building.

Project Traffic Increase

While a traffic study was not required for the proposed project, peak hour project trips of 8 during the peak AM and PM hours[6] would occur with the proposed project. Compared to the existing traffic volumes along The Alameda, these peak hour trips would be insignificant and would not result in a measurable or detectable noise level increase (0 dBA DNL increase). The project would not result in a permanent noise increase of 3 dBA DNL or more at noise-sensitive receptors in the project vicinity. This is a less-than-significant impact.

[6] These peak hour trips are based on a 19-unit development. While the peak hour trips may reduce under the current project conditions of 18 total units, this would represent the worst-case scenario.

Mechanical Equipment

The site plan does not show air conditioning condenser units, which are typical for residential developments. Noise generated by these types of units is typically compatible with other residential developments, as well as churches, offices, and commercial uses, and would not exceed the City's General Plan policies. This would be a less-than-significant impact.

Total Combined Project-Generated Noise

The operational noise levels produced by the proposed project combined (i.e., traffic, mechanical equipment) would not result in an increase of 3 dBA DNL or more at all existing noise-sensitive receptors in the project vicinity. Therefore, the proposed project would not result in a substantial increase over ambient noise levels in the project vicinity. Further, operational noise levels would not exceed the City's General Plan policies. Therefore, this is a less-than-significant impact.

The final design plans should be reviewed by a qualified acoustical consultant to address any potential conflicts with the Municipal Code. The City's standard permit condition shall be implemented as a condition of approval for the proposed project. The standard permit condition states the following:

> A detailed acoustical study shall be prepared during final building design to evaluate the potential noise generated by building mechanical equipment and demonstrate the necessary noise control to meet the City's 55 dBA DNL goal. Noise control features such as sound attenuators, baffles, and barriers shall be identified and evaluated to demonstrate that mechanical equipment noise would not exceed 55 dBA DNL at noise-sensitive locations around the project site. The noise control features identified by the study shall be incorporated into the project prior to issuance of a building permit.

Implementation of the standard permit condition would reduce noise levels originating from the project site to a less-than-significant level.

Mitigation Measure 1b: No further mitigation required.

Impact 2: Exposure to Excessive Groundborne Vibration. With the incorporation of a Construction Vibration Plan as a project condition of approval, the temporary construction vibration impact would be reduced to a **less-than-significant** level.

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.

According to Policy EC-2.3 of the City of San José General Plan, a vibration limit of 0.08 in/sec PPV shall be used to minimize the potential for cosmetic damage to sensitive historical structures, and a vibration limit of 0.20 in/sec PPV shall be used to minimize damage to buildings of normal

conventional construction. The vibration limits contained in this policy are conservative and designed to provide the ultimate level of protection for existing buildings in San José. Vibration levels exceeding these thresholds would be capable of cosmetically damaging adjacent buildings. 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.

According to the City's Historic Resource Inventory,[7] there are several historical structures located in the immediate vicinity of the project site:

- 1818 The Alameda, which is the commercial use adjoining the site (identified in this report as the northwest commercial uses) – approximately 40 feet from the nearest shared property line;
- 1830 The Alameda – approximately 95 feet from the nearest project site boundary;
- 1794 The Alameda, which is the office use south of the project site (identified in this report as the south offices) – approximately 85 feet from the nearest project site boundary;
- 1040 Emory Street, which is one of the south residences in this report – approximately 135 feet from the nearest project site boundary;
- 1024 Emory Street, which is one of the south residences in this report – approximately 170 feet from the nearest project site boundary;
- First Church of Christ Science, located at 1807 The Alameda (identified in this report as the west church) – approximately 160 feet from the nearest project site boundary;
- 1833 The Alameda – approximately 210 feet from the nearest project site boundary;
- 1845 The Alameda – approximately 289 feet from the nearest project site boundary.

At distances of 85 feet and beyond, construction vibration levels would be below 0.06 in/sec PPV, which would be below the City's conservative 0.08 in/sec PPV threshold. Therefore, all historic buildings located 95 feet or more from the project site would not be subject to potential damage from construction vibration.

Table 9 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 9 also summarizes the distances to the 0.08 and 0.2 in/sec PPV thresholds for all historic and conventional buildings, respectively.

[7] www.sanjoseca.gov/your-government/departments/planning-building-code-enforcement/planning-division/historic-preservation/historic-resources-inventory

TABLE 9 Vibration Source Levels for Construction Equipment

Equipment		PPV at 25 ft. (in/sec)	Minimum Distance to Meet City Thresholds, feet	
			0.08 in/sec PPV	0.2 in/sec PPV
Clam shovel drop		0.202	59	26
Hydromill (slurry wall)	in soil	0.008	4	2
	in rock	0.017	7	3
Vibratory Roller		0.210	61	27
Hoe Ram		0.089	28	13
Large bulldozer		0.089	28	13
Caisson drilling		0.089	28	13
Loaded trucks		0.076	24	11
Jackhammer		0.035	12	6
Small bulldozer		0.003	2	<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., October 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 with the cumulative number of equipment in use simultaneously, construction vibration levels depend 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 are measured from the nearest project site boundary and propagated to the nearest receiving off-site structure, unlike construction noise.

The nearest off-site conventional buildings surrounding the site include the north residences and commercial buildings (about 20 feet from the shared property line), the east community center (about 10 feet from the shared property line), and the northeast church (about 35 feet from the shared property line). As shown in Table 9, conventional buildings 27 feet or more from the nearest project site boundaries would be exposed to construction vibration levels at or below 0.2 in/sec PPV. The nearest buildings to the north and east would be within this screening distance. Additionally, historic buildings 58 feet or more from the nearest project site boundaries would be exposed to vibration levels at or below 0.08 in/sec PPV; however, the northwest commercial building adjoining the site would be 40 feet from the nearest project site boundary, which is within the screening distance. For all off-site buildings within the screening distances shown in Table 9, construction vibration for each piece of equipment expected to be used in each phase was estimated at the nearest building façade. These vibration levels are summarized in Table 10.

TABLE 10 Vibration Levels Propagated to the Nearest Buildings Surrounding the Project Site

Phase	Equipment	PPV at 25 ft., in/sec	Nearest Buildings		
			Historic NW Commercial Use (40ft)	Conventional North Res. (20ft)	Conventional East Community Center (10ft)
Site Preparation	Grader	0.089	0.053	0.027	**0.244**
	Rubber-Tired Dozer	0.089	0.053	0.027	**0.244**
	Tractor/Loader/Backhoe	0.003	0.002	0.001	0.008
Grading	Grader	0.089	0.053	0.027	**0.244**
	Rubber-Tired Dozer	0.089	0.053	0.027	**0.244**
	Tractor/Loader/Backhoe	0.003	0.002	0.001	0.008
Building – Exterior	Crane	0.003	0.002	0.001	0.008
	Forklift	0.003	0.002	0.001	0.008
	Generator Set	0.003	0.002	0.001	0.008
	Tractor/Loader/Backhoe	0.003	0.002	0.001	0.008
	Welder	0.003	0.002	0.001	0.008
Building – Interior/ Archit. Coating	Air Compressor	0.003	0.002	0.001	0.008
Paving	Cement & Mortar Mixer	0.003	0.002	0.001	0.008
	Paver	0.003	0.002	0.001	0.008
	Paving Equipment	0.003	0.002	0.001	0.008
	Roller	0.21	**0.125**	**0.268**	**0.575**
	Tractor/Loader/Backhoe	0.003	0.002	0.001	0.008

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., October 2025.

Construction of the proposed project would potentially exceed both the 0.08 in/sec PPV threshold at the adjoining historic building and the 0.2 in/sec PPV threshold at the adjoining conventional buildings to the north if a vibratory roller is used within 61 feet of the historic building and within 27 feet of the conventional buildings. Additionally, the following equipment would result in vibration levels exceeding the 0.2 in/sec PPV threshold at the adjoining conventional community center to the east when used near the shared property line:

- Excavators within 13 feet of adjoining conventional community center;
- Rubber-Tired Dozers within 13 feet of adjoining conventional community center;
- Graders within 13 feet of adjoining conventional community center; and
- Rollers within 27 feet of adjoining conventional community center.

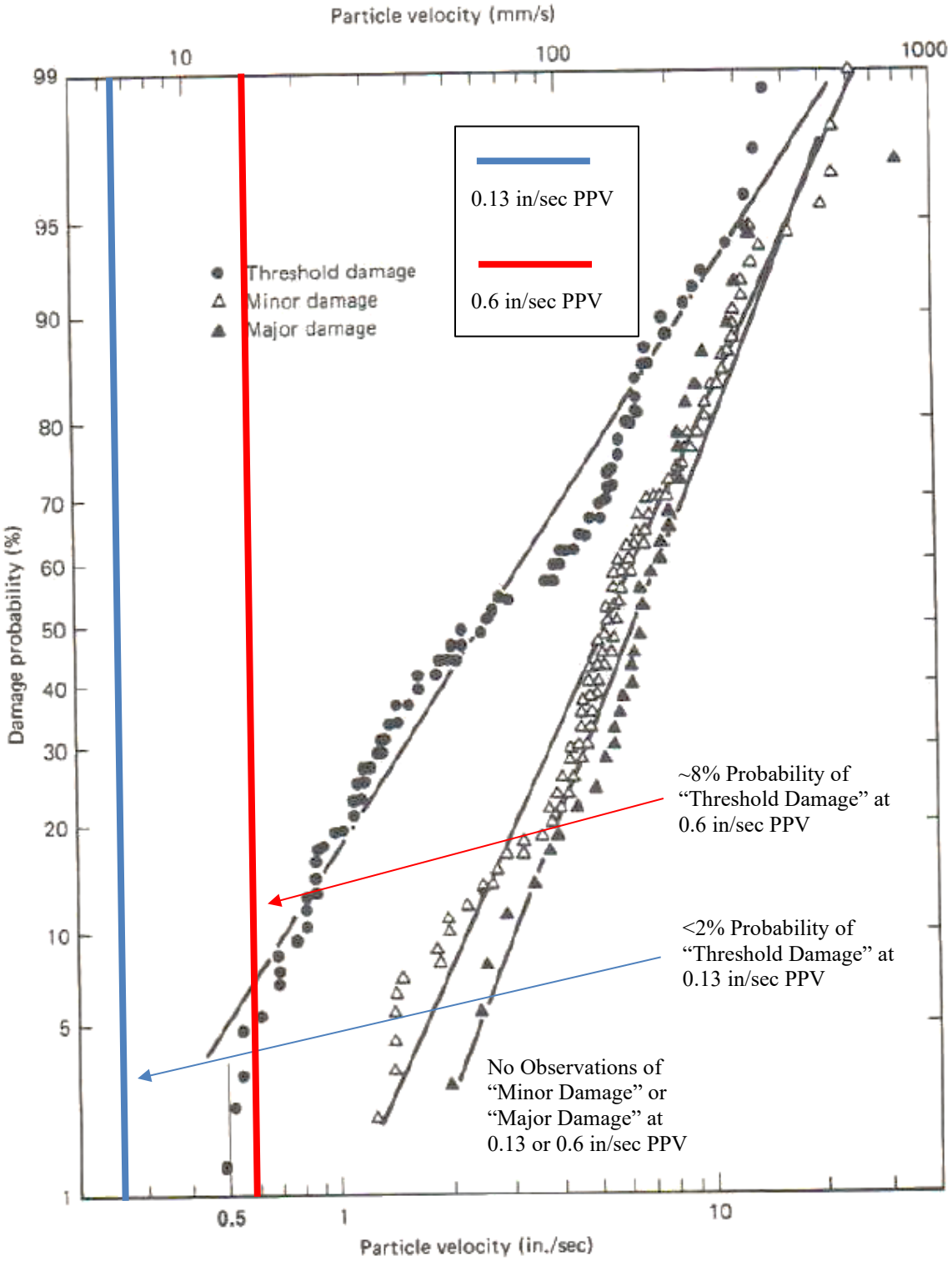
Project construction activities could generate vibration levels up to 0.6 in/sec PPV at the nearest community center façade adjoining the site to the east, approximately 10 feet from the shared property line. For the adjoining historic building (i.e., the northwest commercial use), vibration levels would be up to 0.13 in/sec PPV. A study completed by the US Bureau of Mines analyzed the effects of blast-induced vibration on buildings in USBM RI 8507.[8] The findings of this study have been applied to buildings affected by construction-generated vibrations.[9] As reported in USBM RI 8507[8] and reproduced by Dowding,[9] Figure 4 presents the damage probability, in terms of "threshold damage" (described above as cosmetic damage), "minor damage," and "major damage," at varying vibration levels.

As shown in Figure 4, maximum vibration levels of 0.6 in/sec PPV or lower would result in less than 8% chance of cosmetic damage. Maximum vibration levels of 0.13 in/sec PPV or lower would result in less than 2% chance of cosmetic damage. No minor or major damage would be expected at the buildings immediately adjoining the project site.

[8] Siskind, D.E., M.S. Stagg, J.W. Kopp, and C.H. Dowding, Structure Response and Damage Produced by Ground Vibration form Surface Mine Blasting, RI 8507, Bureau of Mines Report of Investigations, U.S. Department of the Interior Bureau of Mines, Washington, D.C., 1980.

[9] Dowding, C.H., Construction Vibrations, Prentice Hall, Upper Saddle River, 1996.

FIGURE 4 Probability of Cracking and Fatigue from Repetitive Loading



Source: Dowding, C.H., Construction Vibrations, Prentice Hall, Upper Saddle River, 1996.

Neither cosmetic, minor, or major damage would occur at historic buildings located 60 feet or more from the project site or at conventional buildings located 30 feet or more from 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.

The project applicant shall implement a Construction Vibration Control Plan to reduce vibration levels due to construction activities to at or below 0.2 in/sec PPV at conventional buildings adjoining the site and to at or below 0.08 in/sec PPV at the adjoining historic building as a project condition of approval. All plan tasks shall be undertaken in accordance with industry-accepted standard methods. The construction vibration control plan shall include, but not be limited to, the following measures:

- The report shall include a description of measurement methods, equipment used, calibration certificates, and graphics as required to clearly identify vibration-monitoring locations.

- A list of all heavy construction equipment to be used for this project known to produce high vibration levels (e.g., dozers, graders, excavators, and vibratory rollers) shall be submitted to the Director of Planning or Director's designee of the Department of Planning, Building, and Code Enforcement by the contractor. This list shall be used to identify equipment and activities that would potentially generate substantial vibration and to define the level of effort required for continuous vibration monitoring. Phase earth-moving and ground impacting operations so as not to occur during the same time period.

- Smaller equipment (less than 18,000 pounds) shall be used near the property lines shared with the adjoining buildings to minimize vibration levels. For example, a smaller vibratory roller similar to a Caterpillar model CP433E vibratory compactor could be used when compacting materials within 65 feet of the adjacent historic building or 30 feet of the adjacent conventional buildings. For all other equipment identified above, smaller equipment shall be used within 30 feet of the adjacent historic building or within 15 feet of the adjacent conventional buildings. The smaller equipment intended to implement this requirement shall be individually identified among the list of equipment required under the above condition as a subset of equipment allowed for use at the property lines.

- Where possible, use of the heavy vibration-generating construction equipment shall be prohibited within 65 feet of the adjoining historical structure and within 30 feet of the adjoining conventional structures.

- Only use rollers in static mode within 65 feet of the adjoining historic commercial building and within 30 feet of the adjoining conventional buildings to the north and east.

- Avoid using excavators, dozers, and graders within 15 feet of the adjoining conventional buildings to the north and east. Substitute smaller equipment (e.g., Tractor/Loader/Backhoe) to complete the tasks designated for excavators.

- Select demolition methods that do not involve large impact tools. Portable jackhammers, saws, or grinders shall be used to minimize impacts to the ground.

- Avoid dropping heavy equipment and use alternative methods for breaking up existing pavement, such as a pavement grinder, instead of dropping heavy objects.

With the implementation of the above measures, the temporary construction vibration impact would be reduced to a less-than-significant level.

Mitigation Measure 2: No further mitigation required.

Impact 3: **Excessive Aircraft Noise.** The project site is located about 0.76 miles from San José Mineta International Airport, but the noise environment attributable to aircraft is considered normally acceptable under the Santa Clara County ALUC noise compatibility policies for office land uses. This is a **less-than-significant** impact.

San José Mineta International Airport is a public-use airport located approximately 0.76 miles north of the project site. According to the City's Airport Master Plan Environmental Impact Report,[10] the project site lies outside the 60 dBA CNEL/DNL contour line (see Figure 5). According to Policy EC-1.11 of the City's General Plan, the required safe and compatible threshold for exterior noise levels would be at or below 65 dBA CNEL/DNL for aircraft. Therefore, the proposed project would be compatible with the City's exterior noise standards for aircraft noise.

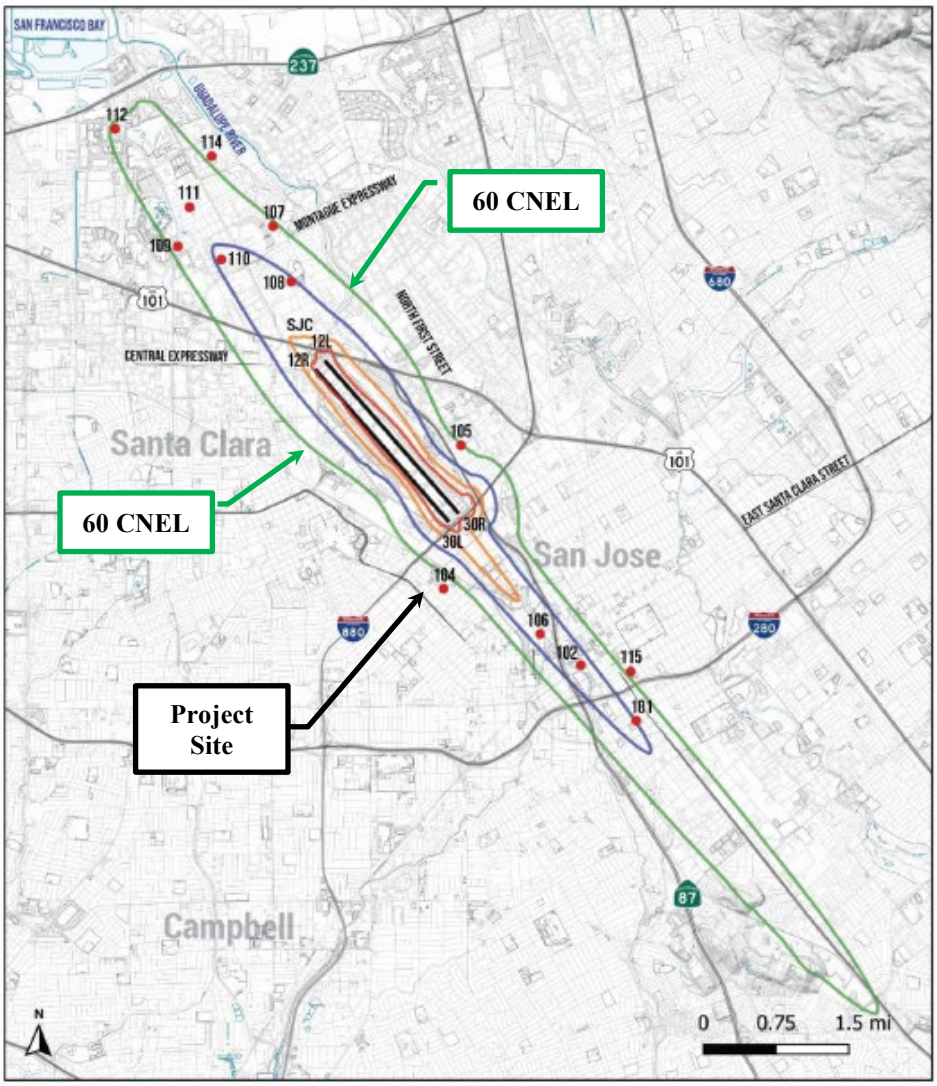
Assuming standard construction materials for aircraft noise below 60 dBA DNL, the future interior noise levels resulting from aircraft would be below 45 dBA DNL at residential interiors. Therefore, future interior noise at the proposed building would be compatible with aircraft noise. This would be a less-than-significant impact.

Mitigation Measure 3: None required.

[10] David J. Powers & Associates, Inc., Integrated Final Environmental Impact Report, Amendment to San Jose Mineta International Airport Master Plan, April 2020.

FIGURE 5 2037 CNEL Noise Contours for SJIA Relative to Project Site

Figure 5
Scenario 2: With Project 2037 Noise Contour Map



NORMAN Y. MINETA SAN JOSE INTERNATIONAL AIRPORT

- Noise Monitoring Station
- 101 Site ID
- Runway
- 75 dBA and Greater CNEL Contour
- 70 dBA and Greater CNEL Contour
- 65 dBA and Greater CNEL Contour
- 60 dBA and Greater CNEL Contour

Figure 5 Scenario 2: With Project 2037 Noise Contour Map

Source: BridgeNet International 2019

Cumulative Impacts

Cumulative noise impacts could result from either cumulative traffic noise increases under future conditions or temporary construction noise from cumulative construction projects.

A significant cumulative traffic noise increase would occur if two criteria are met: 1) if the cumulative traffic noise level increase was 3 dBA DNL or greater for future levels exceeding 60 dBA DNL or was 5 dBA DNL or greater for future levels at or below 60 dBA DNL; and 2) if the project would make a "cumulatively considerable" contribution to the overall traffic noise increase. A "cumulatively considerable" contribution would be defined as an increase of 1 dBA DNL or more attributable solely to the proposed project.

A traffic study was not required for the proposed project. Considering the peak AM and PM trips would be 8 for the proposed project, these trips are insignificant compared to existing volumes. It is assumed that these peak hour trips would be insignificant under future cumulative conditions, as well. Therefore, the project is not expected to result in a significant cumulative traffic noise increase. This is a less-than-significant impact.

From the City's website,[11] the nearest planned or approved development project would be the Diridon Plaza Transit-Oriented Development located at 22 South Montgomery Street, which is more than 3,700 feet from the proposed project site. This project would share noise-sensitive receptors with the proposed project site. There are no planned or approved development projects in the vicinity of the project site, and cumulative construction noise impacts are not expected.

[11] https://gis.sanjoseca.gov/maps/devprojects/

APPENDIX A

FIGURE A1 Daily Trend in Noise Levels for LT-1, Wednesday, October 29, 2025

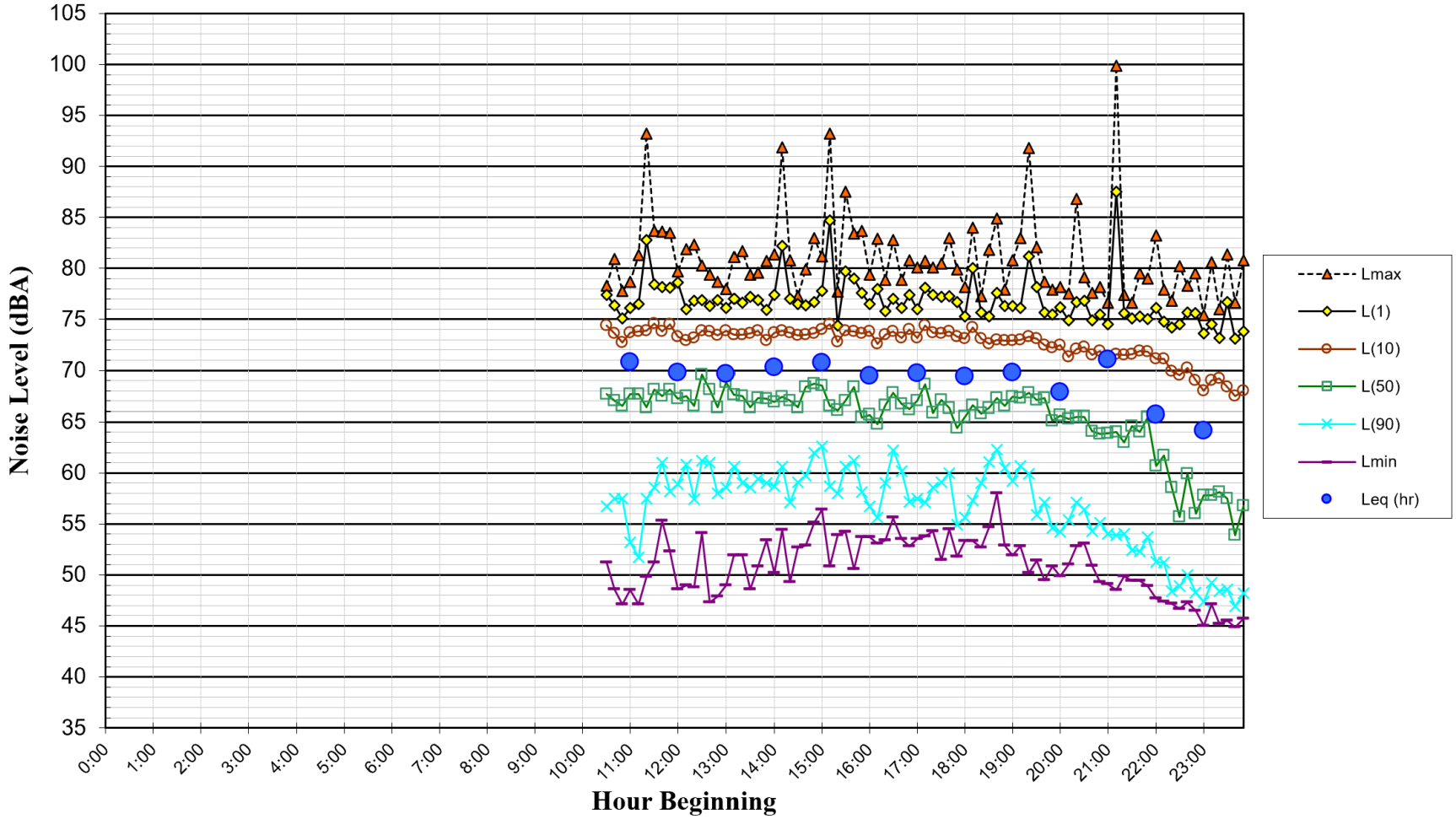
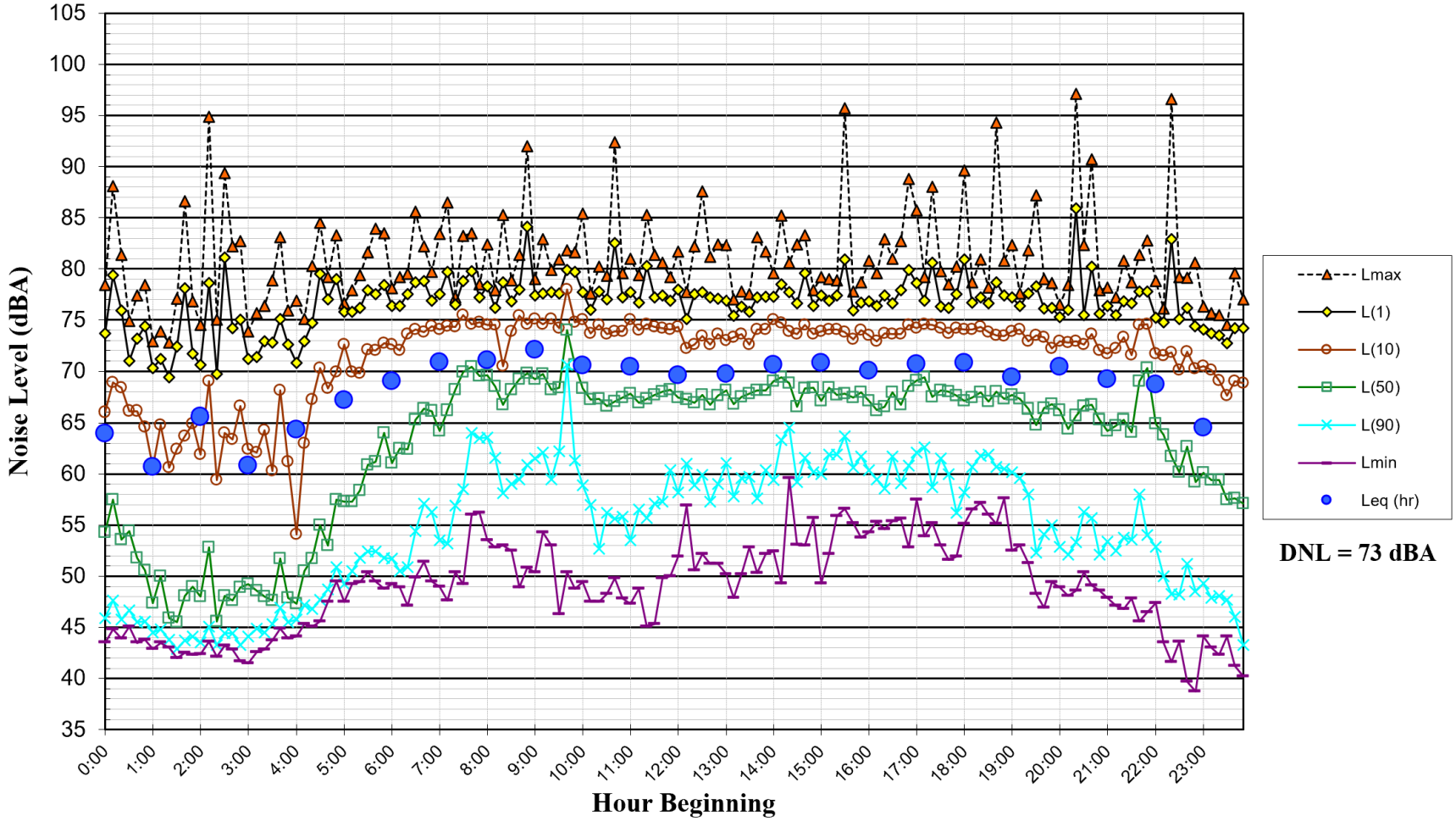


FIGURE A2 Daily Trend in Noise Levels for LT-1, Thursday, October 30, 2025



DNL = 73 dBA

FIGURE A3 Daily Trend in Noise Levels for LT-1, Friday, October 31, 2025

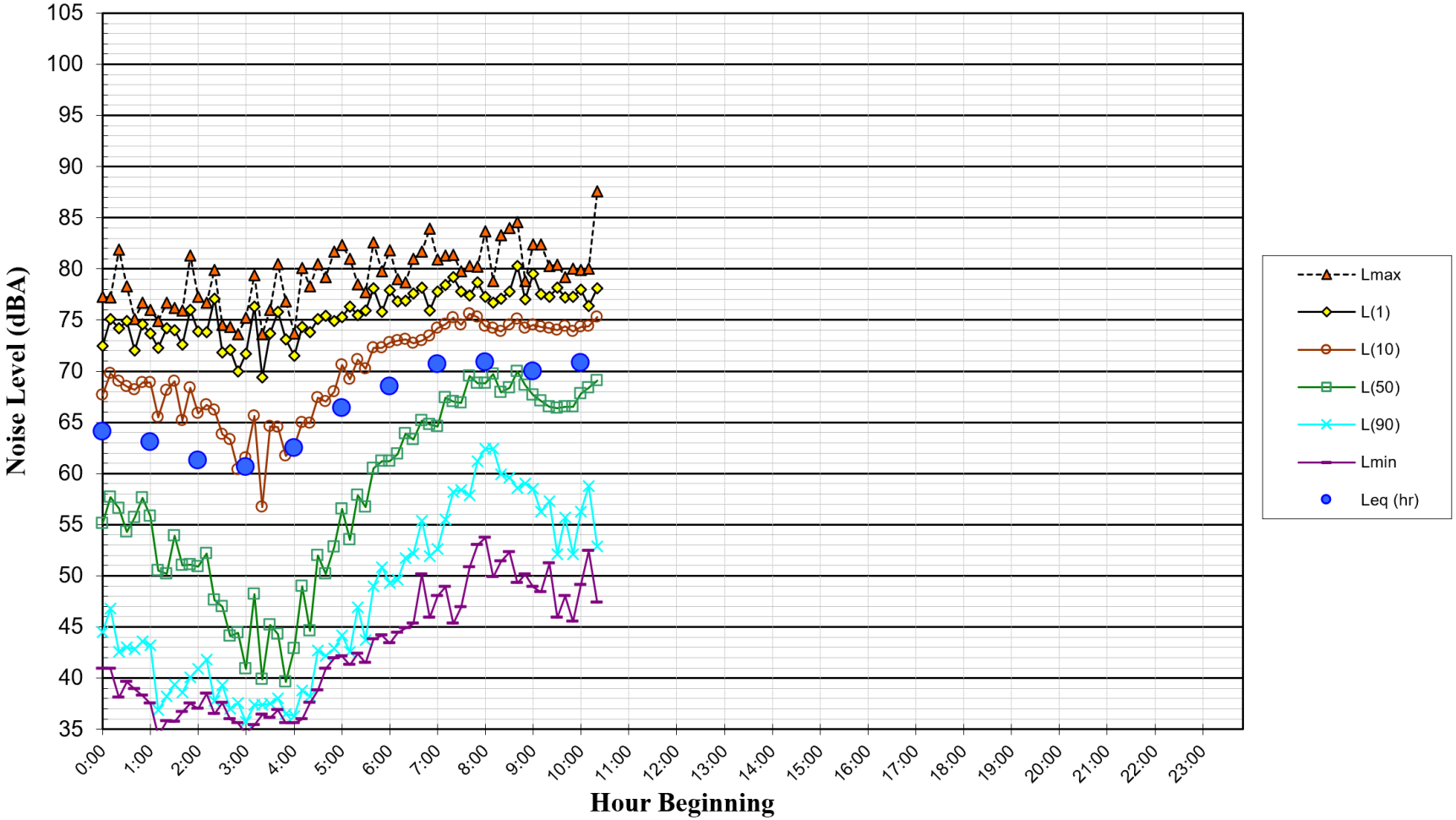


FIGURE A4 Daily Trend in Noise Levels for LT-2, Wednesday, October 29, 2025

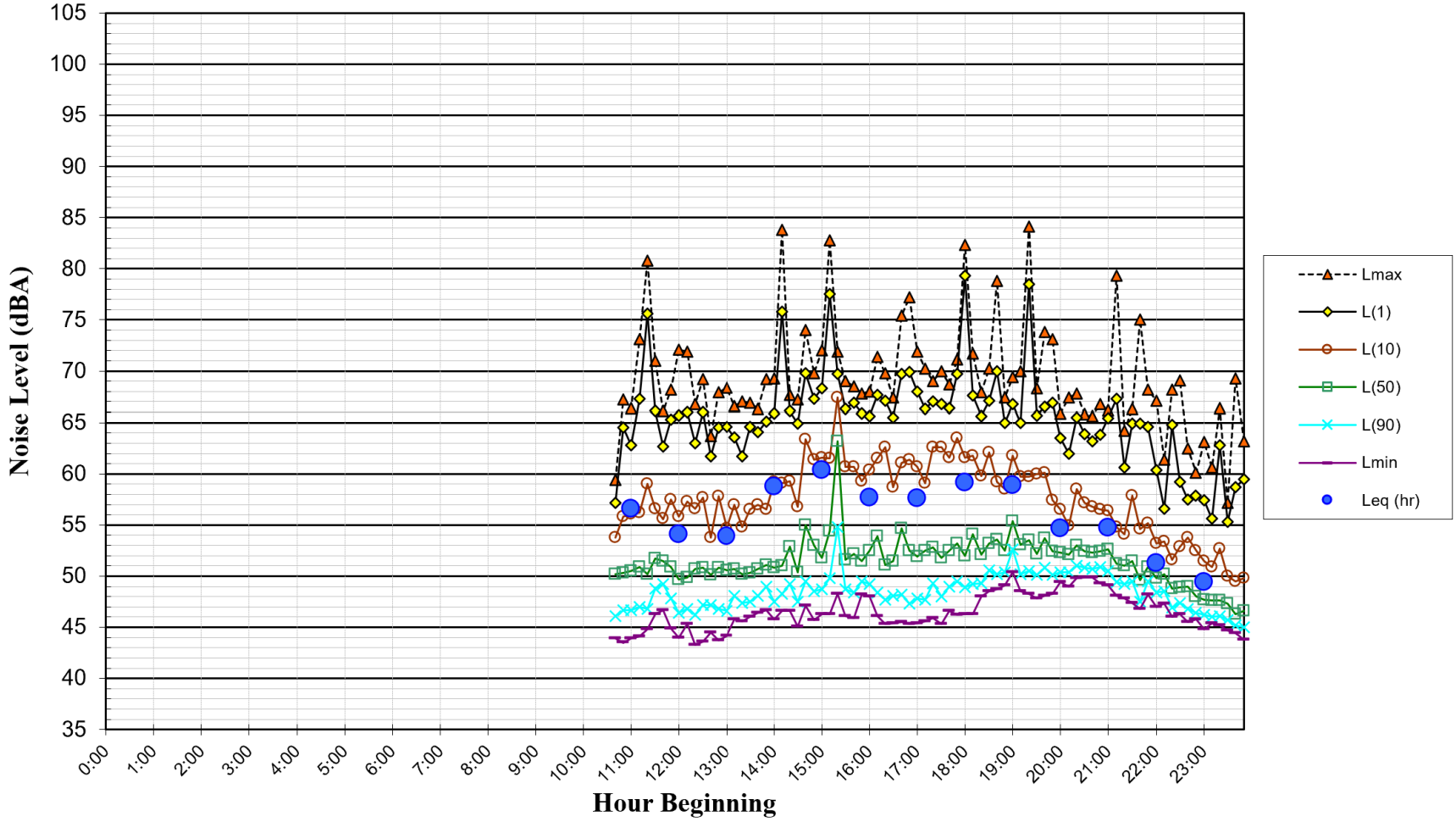
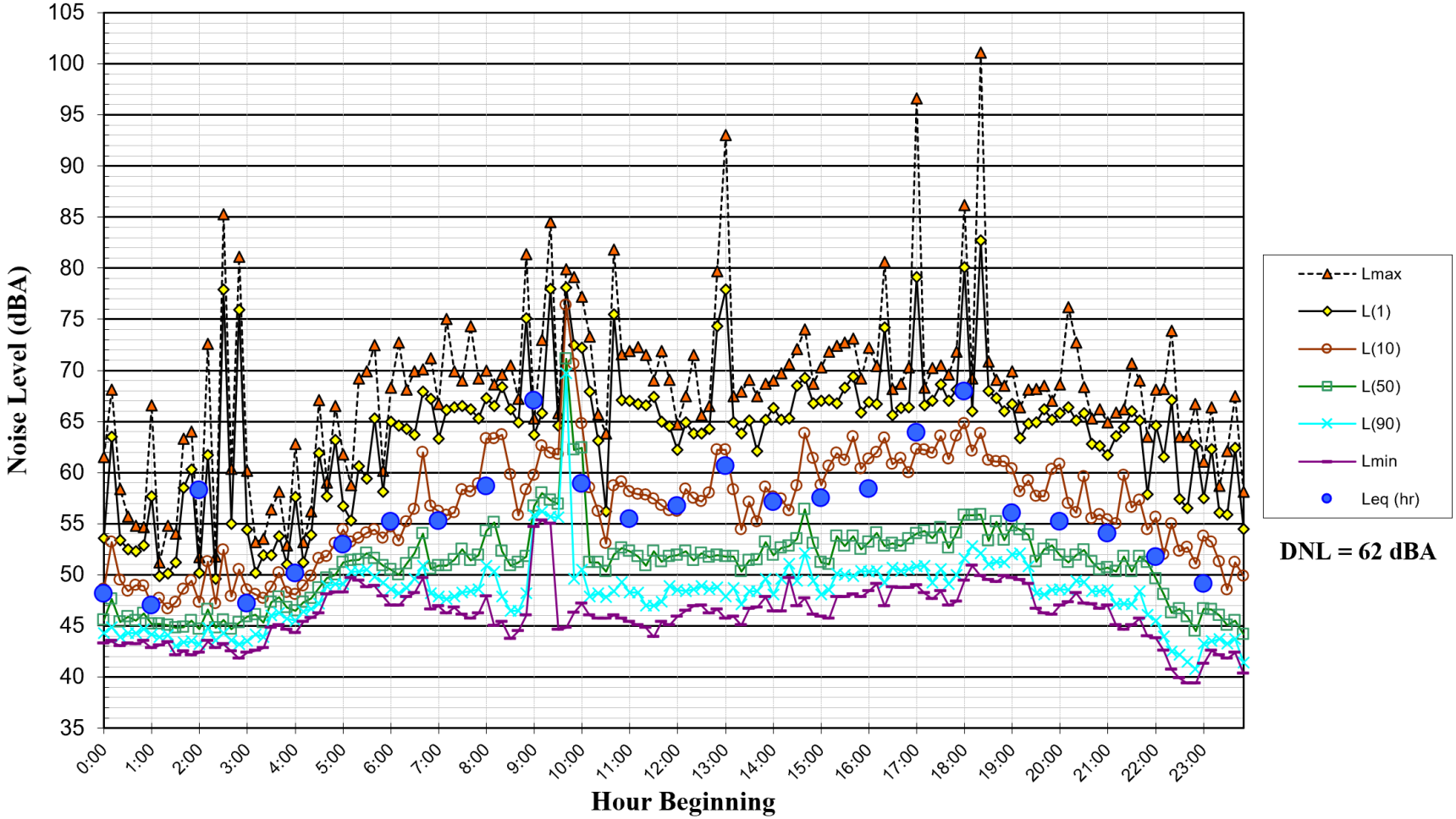


FIGURE A5 Daily Trend in Noise Levels for LT-2, Thursday, October 30, 2025



DNL = 62 dBA

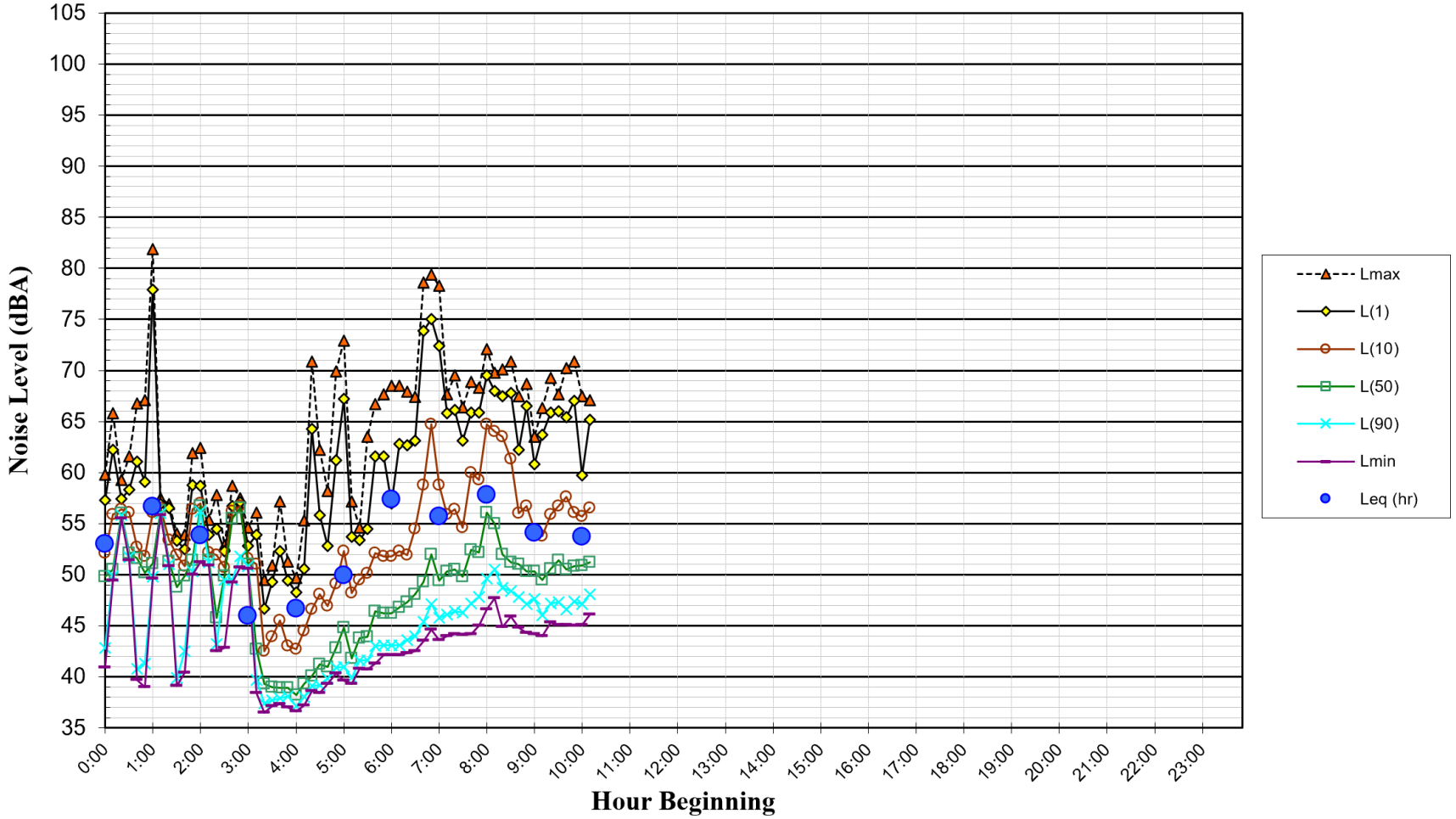



FIGURE A6 Daily Trend in Noise Levels for LT-2, Friday, October 31, 2025