SUZACO MIXED-USE DEVELOPMENT NOISE AND VIBRATION ASSESSMENT

San José, California

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INTRODUCTION

The SuZaCo Mixed-Use Development project proposes the construction of a u-shaped building with six stories at the southwestern corner of the South 4th Street and East Santa Clara Street intersection in San José, California. The new six-story building would consist of ground-level retail/restaurant use and office use on the upper floors. The proposed project would include the demolition of three existing two-story buildings, with a portion of one historical building façade remaining.

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

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 12-17 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 57-62 dBA DNL with open windows and 65-70 dBA DNL if the windows are closed. Levels of 55-60 dBA are common along collector streets and secondary arterials, while 65-70 dBA is a typical value for a primary/major arterial. Levels of 75-80 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 25-30 percent of the population. There is, therefore, an increase of about 2 percent per dBA between a DNL of 60-70 dBA. Between a DNL of 70-80 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 30-35 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, 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, Municipal Code standards, or the applicable standards of other agencies. A summary of the applicable regulatory criteria is provided below.

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.

2019 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 2019 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.

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 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 policies herein, the Noise Compatibility Policies presented in Table 4-1 shall be used to determine if a specific land use is consistent with this CLUP.

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

N-6 Noise level compatibility standards for other types of land uses shall be applied in the same manner as the above residential noise level criteria. Table 4-1 presents acceptable noise levels for other land uses in the vicinity of the Airport.

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.

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:

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-1.3 Mitigate noise generation of new nonresidential land uses to 55 dBA DNL at the property line when located adjacent to existing or planned noise sensitive residential and public/quasi-public land uses.

EC-1.6 Regulate the effects of operational noise from existing and new industrial and commercial development on adjacent uses through noise standards in the City's Municipal Code.

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.

EC-1.11 Require safe and compatible land uses within the Mineta International Airport noise zone (defined by the 65 CNEL contour as set forth in State law) and encourage aircraft operating procedures that minimize noise.

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 at southwestern corner of the South 4th Street/East Santa Clara Street intersection in San José, California. Currently, the project site is bound to the south by an existing parking lot; however, an approved hotel and residential building is planned to the south and to the west of the project site. To the north, opposite East Santa Clara Street, are commercial uses, both existing and future planned uses. To the east, opposite South 4th Street, is San José's City Hall. Multi-family residential towers currently under construction are located northeast of the site, opposite the intersection.

The noise environment at the site and in the surrounding area results primarily from vehicular traffic. Aircraft associated with Mineta San José International Airport also contributes to the existing noise environment in the project vicinity.

A noise monitoring survey consisting of three short-term (ST-1 through ST-3) noise measurements was made in the project site vicinity on Monday, September 13, 2021, between 10:10 a.m. and 11:20 a.m. These measurements coincide with previous short-term measurement locations made for the Hotel Clariana Addition Project (Phase I) in November/December 2018.[1] The previous project also included two long-term measurements (LT-1 and LT-2), and the relative changes in measured noise levels were used to assess the change in the noise environment from 2018 to 2021. All measurement locations are shown in Figure 1.

The noise monitoring survey completed for Hotel Clariana was made from Friday, November 30, 2018 through Monday, December 3, 2018. Noise measurements were made with Larson Davis Model 820 Integrating Sound Level Meters (SLMs) set at "slow" response. The sound level meters

[1] Illingworth & Rodkin, Inc., "Hotel Clariana Addition Noise and Vibration Assessment," March 5, 2019.

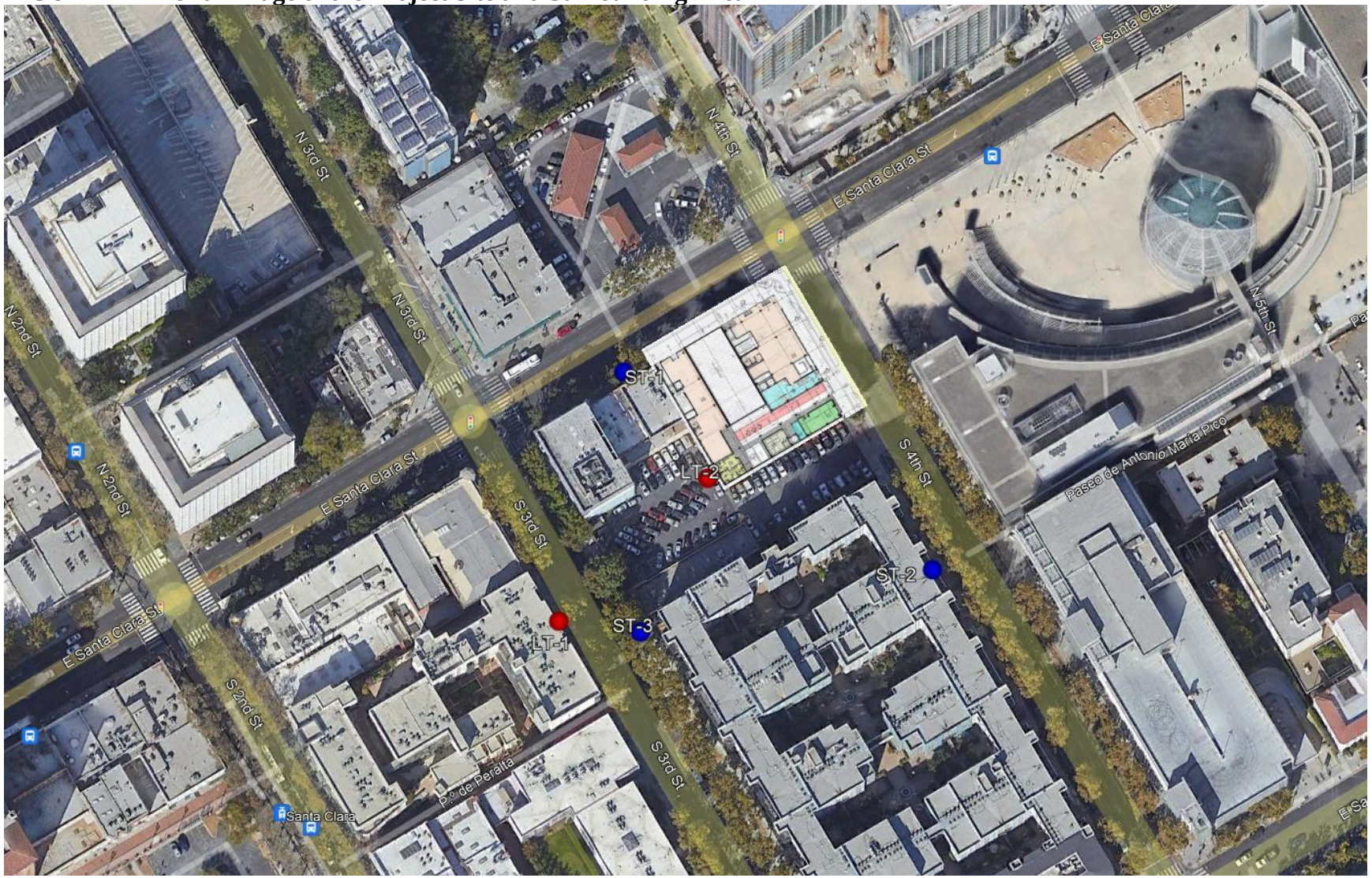
were equipped with G.R.A.S. Type 40AQ ½-inch random incidence microphones fitted with windscreens. The sound level meters were calibrated prior to the noise measurements using a Larson Davis Model CAL200 acoustical calibrator. The response of the system was checked after each measurement session and was always found to be within 0.2 dBA. No calibration adjustments were made to the measured sound levels. At the completion of each monitoring event, the measured interval noise level data were obtained from the SLM using the Larson Davis SLM utility software program.

Long-term noise measurement LT-1 was made approximately 25 feet west of the centerline of South 3rd Street, near an existing mixed-use residential building. Typical hourly average noise levels at this location ranged from 63 to 80 dBA L_{eq} during the day and from 58 to 68 dBA L_{eq} at night. The day-night average noise level over the weekend ranged from 71 to 74 dBA DNL and reached 77 dBA DNL on Monday, December 23, 2018. Loud vehicles and emergency vehicle sirens produced maximum instantaneous noise levels above 100 dBA L_{max}. The daily trends in noise levels at LT-1 is shown in Figures A1 through A4 of the Appendix.

The second long-term noise measurement (LT-2) was made at the east end of the existing Hotel Clariana parking lot to represent the ambient noise environment of receptors set back from all surrounding roadways. Hourly average noise levels at this location ranged from 55 to 67 dBA L_{eq} during the day and from 51 to 64 dBA L_{eq} at night. The day-night average noise level over the weekend ranged from 63 to 67 dBA DNL and was 65 dBA DNL on Monday, December 23, 2018. The daily trends in noise levels at LT-2 is shown in Figures A5 through A8 of the Appendix.

ST-1 was made at 130 East Santa Clara Street, approximately 40 feet from the centerline of the roadway. During the 10-minute measurement, passenger cars generated noise levels of 62 to 79 dBA; heavy trucks generated noise levels of 69 to 73 dBA; buses generated noise levels of 68 to 77 dBA; and motorcycles generated noise levels of 72 to 84 dBA. The 10-minute L_{eq} measured at ST-1 in 2021 was 69 dBA, which was approximately 1 dBA lower than the short-term measurement in 2018. ST-2 was made along South 4th Street, about halfway between East Santa Clara Street and East San Fernando Street. ST-2 was made approximately 35 feet from the centerline of South 4th Street. During the 10-minute measurement, passenger cars along South 4th Street generated noise levels of 63 to 77 dBA. The 10-minute L_{eq} measured at ST-2 in 2021 was 65 dBA, which was approximately 4 dBA lower than the short-term measurement in 2018. ST-3 was made approximately 35 feet from the centerline of South 3rd Street, opposite LT-1. During the 10-minute measurement, passenger cars along South 3rd Street generated noise levels of 61 to 75 dBA; heavy trucks generated noise levels of 73 dBA; and overhead jets generated noise levels of 64 dBA. The 10-minute L_{eq} measured at ST-3 in 2021 was 64 dBA, which was approximately 1 dBA lower than the short-term measurement in 2018. Since all of the short-term measurements were similar to those measured in 2018, the long-term measurements made in 2018 can be used to represent the existing ambient environment at the project site and in the surrounding area. Table 4 summarizes the results of the short-term noise measurements made in 2021.

FIGURE 1 Aerial Image of the Project Site and Surrounding Area



Source: Google Earth, 2021.

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: ~40 feet south of the centerline of East Santa Clara Street	9/13/2021, 10:10-10:20	85	79	72	66	63	69
ST-2: ~35 feet west of the centerline of South 4th Street	9/13/2021, 10:50-11:00	76	73	70	61	57	65
ST-3: ~35 feet east of the centerline of South 3rd Street	9/13/2021, 11:10-11:20	76	73	68	62	60	64

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 70 dBA DNL or less for the proposed commercial office and retail land uses.

- 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 nearby roadways. According to the traffic study completed for the *Downtown San José Strategy Plan 2040 EIR*,[2] the traffic noise level increase along East Santa Clara Street at the project site would be 2 dBA DNL above existing conditions under each of the 2040 cumulative buildout alternatives.

Future Exterior Noise Environment

The proposed project includes private outdoor balconies on each of the upper levels; for mixed-use buildings located in the Downtown of San José, private balconies are not considered common-use outdoor areas subject to the exterior noise thresholds. On level 5, there are two rooftop amenity decks, which would be considered a common-use outdoor area. The roof plan also shows an amenity deck.

[2] City of San José, "Downtown San José Strategy Plan 2040 Environmental Impact Report," December 2018.

One of the rooftop amenity decks would be located at the rear of the site, the center of which is approximately 175 feet from the centerline of East Santa Clara Street. Due to the location and elevation of this rooftop amenity deck with respect to the roadway below, the occupants would be adequately shielded from surrounding traffic noise, receiving more than 20 dBA of attenuation. The future exterior noise levels at the rear rooftop amenity deck would be below 70 dBA DNL.

The second rooftop amenity deck located on level 5 would be located along the northern façade of the building, adjacent to East Santa Clara Street. The center of this rooftop amenity deck would be approximately 50 feet from the centerline of the roadway. Due to the elevation of this amenity deck being more than 55 feet above the ground surface and the center of the space being setback 10 feet from the edge of the building, more than 10 dBA attenuation would occur at the center of the outdoor use area. Future exterior noise levels would be below 70 dBA DNL towards the center of the amenity deck where the majority of the extended use would occur.

The amenity deck located on the roof of the building would be elevated more than 84 feet above the ground level. With the center of this space set back by more than 50 feet, the occupants would be adequately shielded from surrounding traffic noise. The future exterior noise levels at the roof terrace would be below 70 dBA DNL.

The future noise levels at the centers of the outdoor use areas associated with the commercial component of the proposed project would meet the City's normally acceptable threshold of 70 dBA DNL.

Future Interior Noise Environment

Ground-level commercial retail uses and commercial offices on the upper floors are proposed as part of the project. The setback of the northern building façade from the centerline of East Santa Clara Street is approximately 45 feet. Based on the results of *Downtown San José Strategy Plan 2040 EIR,* daytime hourly average noise levels at the ground level of the building exterior would be up to 74 dBA L_{eq} at the northern building façade, with day-night average noise levels up to 72 dBA DNL. On the upper floors, the daytime hourly average noise levels and day-night average noise level would be lower.

Standard construction materials for commercial 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 $L_{eq(1\text{-}hr)}$.

Spaces where lower noise levels would be desired, such as private offices and conference rooms, may benefit from additional noise control in order to meet a lower, more desirable interior noise level. Additional noise control could be accomplished by selecting higher sound-rated windows (STC 34 or greater along exterior façades).

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 significant noise impact would be identified if the project would generate a substantial temporary or permanent noise level increase over ambient noise levels at existing noise-sensitive receptors surrounding the project site and that would exceed applicable noise standards presented in the General Plan at existing noise-sensitive receptors surrounding the project site.

    - A significant noise impact would be identified if construction-related noise would temporarily increase ambient noise levels at sensitive receptors. The City of San José considers large or complex projects involving substantial noise-generating activities and lasting more than 12 months significant when within 500 feet of residential land uses or within 200 feet of commercial land uses or offices.

    - A significant permanent noise level increase would occur if the project would result in: a) a noise level increase of 5 dBA DNL or greater, with a future noise level of less than 60 dBA DNL, or b) a noise level increase of 3 dBA DNL or greater, with a future noise level of 60 dBA DNL or greater.

    - A significant noise impact would be identified if the project would expose persons to or generate noise levels that would exceed applicable noise standards presented in the General Plan.

- A significant impact would be identified if the construction of the project would generate excessive vibration levels surrounding receptors. Groundborne vibration levels exceeding 0.08 in/sec PPV would have the potential to result in cosmetic damage to historic buildings, and groundborne vibration levels exceeding 0.2 in/sec PPV would have the potential to result in cosmetic damage to normal buildings.

- A significant noise impact would be identified if the project would expose people residing or working in the project area to excessive aircraft noise levels.

Impact 1a: **Temporary Construction Noise.** Existing noise-sensitive land uses would be exposed to a temporary increase in ambient noise levels due to project construction activities. **This is a significant impact.**

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.

Project construction proposes standard work hours from 7:00 a.m. to 7:00 p.m.

Ambient noise levels at existing noise-sensitive receptors in the project vicinity would range from 55 to 80 dBA L_{eq} during daytime hours based on the 2018 measurements taken at LT-1 and LT-2.

Construction activities generate considerable amounts of noise, especially during earth-moving activities when heavy equipment is used. The construction of the proposed project would involve demolition of the existing buildings located at the site, excavation/grading, trenching/foundations, utilities, and building construction. 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. Alternatively, cast in drilled hole piles (CIDH) will be used for the foundation of the proposed building.

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 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 mixed-use commercial 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.

A detailed list of equipment expected to be used during each phase of project construction was provided for this analysis and is summarized in Table 7. 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 every piece of equipment would operate simultaneously, which would represent the worst-case scenario. 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.

For each phase, the worst-case hourly average noise level were estimated at the property line of each surrounding land use. For overall construction noise levels, multiple pieces of equipment used simultaneously would add together, creating a collective noise source. While every piece of equipment per phase would likely be scattered throughout the site, the noise-sensitive receptors surrounding the site would be subject to the collective noise source generated by all equipment operating at once. Therefore, to assess construction noise impacts at the receiving property lines of noise-sensitive receptors, the collective worst-case hourly average noise level for each phase was positioned at the geometrical center of the site and propagated to the nearest property line of the surrounding land uses. These noise level estimates are also shown in Table 7. Noise levels in Table 7 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 at Nearby Land Uses

Phase of Constr.	Time Duration	Construction Equipment (Quantity)	Calculated Hourly Average Noise Levels, L_{eq} (dBA)									
			Daytime Ambient Noise Levels = 55 to 80 dBA L_{eq}									
			Adj. Exist. Comm. (25ft)		Adj. Fut. Res. & Hotel & Exist. Comm. (70ft)		North Fut. & Exist. Comm. (145ft)		NE Fut. Res. (205ft)		City Hall (135ft)	
			Level, dBA	Exceeds Ambient by 5 dBA or more?	Level, dBA	Exceeds Ambient by 5 dBA or more?	Level, dBA	Exceeds Ambient by 5 dBA or more?	Level, dBA	Exceeds Ambient by 5 dBA or more?	Level, dBA	Exceeds Ambient by 5 dBA or more?
Demolition	9/1/2022-10/31/2022	Concrete/Industrial Saw (2) Excavator (1) Rubber-Tired Dozer (2) Tractor/Loader/Backhoe (2)	95	Yes	86	Yes	79	No	76	No	80	No
Site Preparation	11/1/2022-12/1/2022	Grader (1) Rubber-Tired Dozer (2) Tractor/Loader/Backhoe (2)	93	Yes	84	No	77	No	74	No	78	No
Grading/ Excavation	12/2/2022-1/31/2023	Excavator (2) Rubber-Tired Dozer (2) Concrete/Industrial Saw (2) Tractor/Loader/Backhoe (1)	94	Yes	85	Yes	79	No	76	No	80	No
Trenching/ Foundation	2/1/2023-4/12/2023	Tractor/Loader/Backhoe (2) Crane (1) Forklift (1) Concrete Pump (1) Drill Rig (1) Chassis Attachment (1) Air Compressor (1)	91	Yes	82	No	76	No	73	No	77	No
Building – Exterior	4/12/2023-10/9/2023	Crane (1) Forklift (5) Generator Set (2) Tractor/Loader/Backhoe (2) Welder (5)	92	Yes	83	No	77	No	74	No	78	No
Building – Interior/ Architectural Coating	10/9/2023-2/6/2024	Air Compressor (1) Aerial Lift (12)	86	Yes	77	No	71	No	68	No	71	No
Paving	2/6/2024-2/26/2024	Cement & Mortar Mixer (2) Paver (1) Paving Equipment (1) Roller (1)	91	Yes	82	No	75	No	72	No	76	No

As shown in Table 7, ambient levels at the surrounding uses would potentially be exceeded by 5 dBA L_{eq} or more at various times throughout construction at both residential and commercial receptors. Project construction is expected to last for a period of approximately 18 months. Since project construction would last for a period of more than one year and considering that the project site is within 500 feet of existing residential uses and within 200 feet of existing commercial uses, this temporary construction impact would be considered significant in accordance with Policy EC-1.7 of the City's General Plan.

The proposed project falls within the *Downtown San José Strategy Plan 2040 EIR* plan area, which included mitigation measures to reduce temporary construction noise levels at noise-sensitive receptors. The *Downtown San José Strategy Plan 2040 EIR* would enforce Policy EC-1.7 of the City's General Plan, which states the following:

> Construction operations within the City will be required to use available noise suppression devices and techniques and continue to 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.

Additionally, the City requires that reasonable noise reduction measures be incorporated into the construction plan and implemented during all phases of construction activity. Accordingly, the *Downtown San José Strategy Plan 2040 EIR* requires that all projects shall implement the following standard noise control measures:

- The contractor shall use "new technology" power construction equipment with state-of-the-art noise shielding and muffling devices. All internal combustion engines used on the project site shall be equipped with adequate mufflers and shall be in good mechanical condition to minimize noise created by faulty or poorly maintained engines or other components.

- The unnecessary idling of internal combustion engines shall be prohibited. Staging areas and stationary noise-generating equipment shall be located as far as possible from noise-sensitive receptors such as residential uses (a minimum of 200 feet, where feasible).

- The surrounding neighborhood within 500 feet shall be notified early and frequently of the construction activities.

- A "noise disturbance coordinator" shall be designated to respond to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaints (e.g., beginning work too early, bad muffler, etc.) and institute reasonable measures warranted to correct the problem. A telephone number for the disturbance coordinator would be conspicuously posted at the construction site.

Adherence to the Municipal Code requirements would minimize impacts to neighboring properties from temporary increases in ambient noise levels resulting from future construction activities. Larger projects within the *Downtown San José Strategy Plan 2040 EIR* plan area that are expected to last over one year in duration, such as the proposed project, may result in a substantial temporary noise increase at adjacent land uses and would require a "construction noise logistics plan," in accordance with GP Policy EC-1.7. As stated in the *Downtown San José Strategy Plan 2040 EIR*, typical construction noise logistics plan would include, but not be limited to, the following measures to reduce construction noise levels as low as practical:

- Utilize 'quiet' models of air compressors and other stationary noise sources where technology exists;

- Equip all internal combustion engine-driven equipment with mufflers, which are in good condition and appropriate for the equipment;

- Locate all stationary noise-generating equipment, such as air compressors and portable power generators, as far away as possible from adjacent land uses;

- Locate staging areas and construction material areas as far away as possible from adjacent land uses;

- Prohibit all unnecessary idling of internal combustion engines;

- If impact driving is proposed, multiple-pile drivers shall be considered to expedite construction. Although noise levels generated by multiple pile drivers would be higher than the noise generated by a single pile driver, the total duration of pile driving activities would be reduced; *(not applicable)*

- If impact pile driving is proposed, temporary noise control blanket barriers shall shroud pile drivers or be erected in a manner to shield the adjacent land uses. Such noise control blanket barriers can be rented and quickly erected; *(not applicable)*

- If impact pile driving is proposed, foundation pile holes shall be pre-drilled to minimize the number of impacts required to seat the pile. Pre-drilling foundation pile holes is a standard construction noise control technique. Pre-drilling reduces the number of blows required to seat the pile. Notify all adjacent land uses of the construction schedule in writing; *(not applicable)*

- Designate a "disturbance coordinator" who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator will determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and will require that reasonable measures warranted to correct the problem be implemented. Conspicuously post a telephone number for the disturbance coordinator at the construction site and include it in the notice sent to neighbors regarding the construction schedule.

With the implementation of GP Policy EC-1.7, Municipal Code requirements, and the above measures included in the *Downtown San José Strategy Plan 2040 EIR*, the temporary construction noise impact during daytime hours would be reduced to a less-than-significant level.

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. The proposed project would not exceed applicable standards established in the City's General Plan at the nearby residential receptors with the incorporation of the mitigation measures provided in the *Downtown San José Strategy Plan 2040 EIR*. This is a **less-than-significant impact** with the incorporation of mitigation measures from the DTS 2040 Plan.

According to Policy EC-1.2 of the City's General Plan, a significant permanent noise increase would occur if 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. 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. Therefore, a significant impact would occur if traffic due to the proposed project would permanently increase ambient levels by 3 dBA DNL. For reference, a 3 dBA DNL noise increase would be expected if the project would double existing traffic volumes along a roadway.

Under the City's Noise Element, noise levels from nonresidential building equipment shall not exceed a noise level of 55 dBA DNL at receiving noise-sensitive land uses. Future noise-sensitive receptors would adjoin the site to the west and to the south, in addition to northeast of the site, opposite the South 4th Street/East Santa Clara Street intersection. General Plan Policies EC-1.3 and EC-1.6 shall be enforced for the proposed project.

Project Traffic Increase

The traffic study completed in December 2021 included peak hour turning movements for the existing traffic volumes and project trips at four intersections in the vicinity of the project site. The peak hour project trips were added to the existing traffic volumes to establish the existing plus

project traffic scenario. By comparing the existing plus project traffic scenario to the existing scenario, the project's contribution to the overall noise level increase would not be measurable or detectable (0 dBA DNL increase).

Mechanical Equipment

Mechanical equipment is shown along the western edge of the building on level 5. The roof plan for the proposed building also shows mechanical equipment towards the center of the site and along the southeastern edge of the building. Details pertaining to the number, size, type, and manufacturer-provided noise level information of such equipment were not available at the time of this study. However, the emergency generator, which would be located on the roof towards the rear of the building, would have a capacity of 100 kilowatts (kW). While the site plan shows a screen, it does not appear to be a solid wall, which would provide shielding for the surrounding uses. For purposes of assessing the worst-case scenario, no attenuation due to mechanical screening is assumed for this analysis.

Mixed-use commercial buildings typically include heating, ventilation, and air-conditioning (HVAC) units, heat pumps, condensers, etc. Typically, these types of equipment would have noise levels ranging from 56 to 66 dBA at a distance of 3 feet. This equipment would cycle on and off throughout the day and night. Assuming worst-case conditions, up to eight units could operate simultaneously at any given time, generating noise levels up to 75 dBA at 3 feet. Without knowing specific locations for the equipment, the location nearest to adjacent noise-sensitive receptors would be on level 5, approximately 5 feet from the shared property line. At this distance, noise levels would be up to 71 dBA L_{eq} and up to 77 dBA DNL, assuming the equipment runs continuously and would not include attenuation. This would exceed the City's 55 dBA DNL threshold. Since the nearest residential use would be a future noise-sensitive receptor, this future residential use would not be subject to Policy EC-1.2.

The emergency generator proposed for the project would have a capacity of 100 kW. Generators of this size would typically generate noise levels up to 87 dBA at a distance of 23 feet, with noise levels potentially being reduced by more than 8 dBA with the inclusion of sufficient noise control features. Emergency generators are typically tested monthly for a period of one hour between 7:00 a.m. and 10:00 p.m. Further, it is assumed that the City's thresholds would not apply during emergency conditions when the generators may run continuously during daytime and nighttime hours. During the testing periods, the threshold would apply. The generator room would be located on the roof, approximately 20 feet from the southern property line, which would be shared with the nearest residential use. Hourly average noise levels at the nearest residential property line, assuming no attenuation, would range from 80 to 88 dBA L_{eq}, depending on noise control features. The day-night average noise level would range from 66 to 74 dBA DNL, depending on noise control features.

Mechanical equipment noise levels would potentially exceed the City's General Plan threshold of 55 dBA DNL at the future noise-sensitive uses adjoining the site. Mechanical equipment would not result in a permanent noise level increase of 3 dBA DNL or more at the nearest existing residential use.

The final design plans should be reviewed by a qualified acoustical consultant to address any potential conflicts with the General Plan or Municipal Code. For noise-generating land uses, the *Downtown San José Strategy Plan 2040 EIR* states the following:

> The implementation of General Plan Policies EC-1.2, EC-1.3, and EC-1.9 would reduce potential impacts associated with new noise-producing land uses facilitated by the plan to a less-than-significant level. Policy EC-1.2 limits noise generation by requiring use of noise attenuation measures, such as acoustical enclosures and sound barriers, where feasible, to avoid substantial increases to ambient noise. General Plan Policy EC-1.3 would be implemented and would require new projects to mitigate noise generation to 55 dBA DNL at the property line. Lastly, General Plan Policy EC-1.9 would be implemented and would require that studies be conducted to mitigate loud intermittent noise sources associated with new projects.

The implementation of this mitigation measure would reduce noise levels originating from the project site to a less-than-significant level.

Truck Loading and Unloading

The site plan shows truck loading and unloading activities occurring on the ground-level towards the rear of the building. However, the loading zone would be completely surrounded by the building; therefore, noise levels due to loading and unloading activities, including trash pick-up would be well-shielded from surrounding noise-sensitive uses and would meet the City's 55 dBA DNL threshold. 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, truck loading/unloading activities) would not substantially increase ambient noise levels at existing receptors in the project vicinity. Further, operational noise levels would not exceed 55 dBA DNL at the nearest future residential land uses with the incorporation of the City's standard permit code as a condition of approval. This is a less-than-significant impact with the incorporation of mitigation measures included in the DTS 2040 Plan.

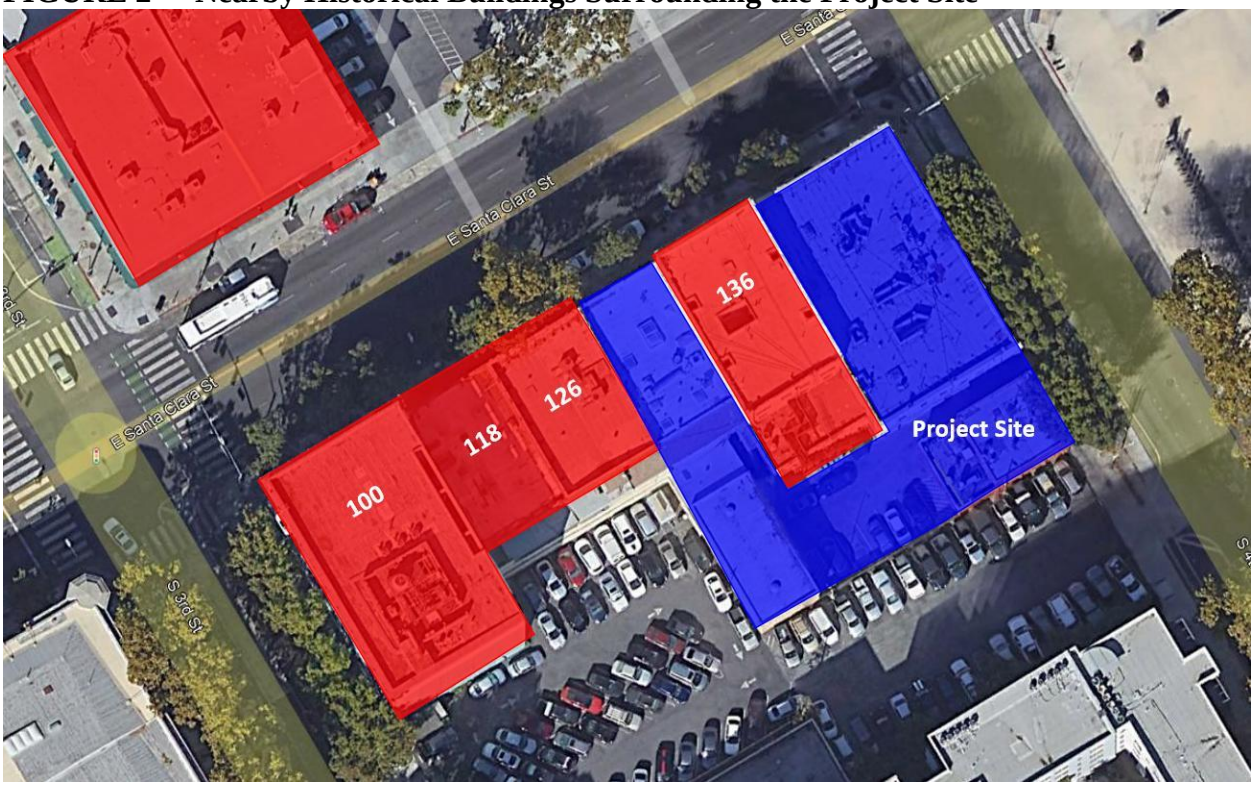
Mitigation Measure 1b: No further mitigation required.

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 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 San José Historic Commercial District surrounds and includes the project site, according to the City's Historic Resource Inventory.[3] Figure 2 shows an aerial shot taken from the Historic Resource Inventory, identifying the project site and the surrounding historical structures. In addition to historical structures adjoining the site, the existing building on the project site at the corner is also considered a historical building, and three stories of the existing façade shall remain under project conditions; however, the building located on the project site would not be analyzed as a historical building in this study since any damage caused by project construction is assumed to be corrected as part of the project.

FIGURE 2 Nearby Historical Buildings Surrounding the Project Site



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 at 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. As discussed in detail below, 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.

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

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

Vibration levels would vary depending on soil conditions, construction methods, and equipment used. Table 8 also summarizes the distances to the 0.08 in/sec PPV threshold for historical buildings and to the 0.2 in/sec PPV threshold for all other buildings.

TABLE 8 Vibration Source Levels for Construction Equipment

Equipment		PPV at 25 ft. (in/sec)	Minimum Distance to Meet 0.08 in/sec PPV (feet)	Minimum Distance to Meet 0.2 in/sec PPV (feet)
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., September 2021.

As shown in Figure 2, the commercial buildings adjoining the site to the east and west are considered historical and would be subject to the conservative 0.08 in/sec PPV, as would the commercial building north of the site, opposite East Santa Clara Street. All other existing and future buildings surrounding the project site would be considered a normal conventional construction building subject to the 0.2 in/sec PPV threshold.

Table 9 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 9), which are different than the distances used to propagate construction noise levels (as shown in Table 7), were estimated under the assumption

that each piece of equipment from Table 8 was operating along the nearest boundary of the project site, which would represent the worst-case scenario.

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 of the historical buildings adjoining the project site to the west. As shown in Table 8, the 0.08 in/sec PPV threshold would potentially be exceeded within about 60 feet of the surrounding buildings, and due to the close proximity of the buildings adjoining the project site (about 5 feet), the use of most construction equipment along the shared property line would potentially exceed the City's threshold, as shown in Table 9. Additionally, the non-historical residential building adjoining the project site to the south, which is also located about 5 feet from the shared property line, would potentially be exposed to vibration levels exceeding the 0.2 in/sec PPV threshold when heavy vibration-generating equipment is used near the shared property line.

A study completed by the US Bureau of Mines analyzed the effects of blast-induced vibration on buildings in USBM RI 8507.[4] The findings of this study have been applied to buildings affected by construction-generated vibrations.[5] As reported in USBM RI 8507[4] and reproduced by Dowding,[5] Figure 3 presents the damage probability, in terms of "threshold damage," "minor damage," and "major damage," at varying vibration levels. Threshold damage, which is described as cosmetic damage in this report, would entail hairline cracking in plaster, the opening of old cracks, the loosening of paint or the dislodging of loose objects. Minor damage would include hairline cracking in masonry or the loosening of plaster, and major structural damage would include wide cracking or shifting of foundation or bearing walls.

As shown in Figure 3, maximum vibration levels of 0.2 in/sec PPV or lower would result in virtually no measurable damage, while levels of 0.4 in/sec PPV would result in less than a 5% chance of threshold or cosmetic damage and no minor or major damage. With maximum vibration levels of 1.2 in/sec PPV, there would be about 20% chance of threshold or cosmetic damage. As shown in Figure 3, minor or major damage would not be expected at the historical buildings and conventional buildings immediately adjoining the project site since this level of damage would only occur from vibration levels exceeding 1.2 in/sec PPV.

Heavy vibration-generating construction equipment would have the potential to produce vibration levels of 0.08 in/sec PPV or more at historic buildings within 60 feet of the project site and of 0.2 in/sec PPV of more at nonhistorical buildings within 25 feet of the project site.

Neither cosmetic, minor, or major damage would occur at historical or conventional buildings located 60 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

[4] 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.

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

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.

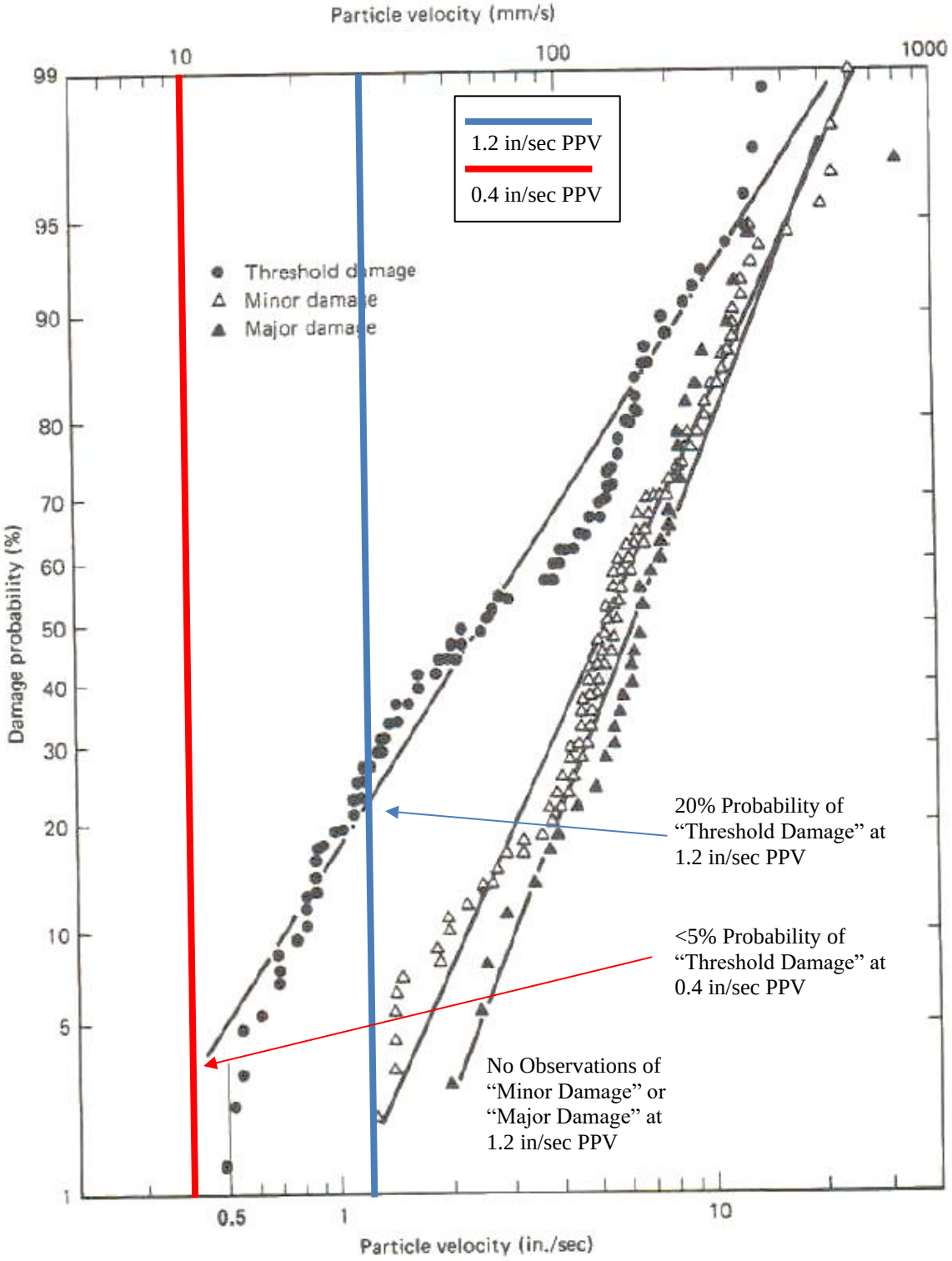
In summary, the construction of the project would generate vibration levels exceeding the General Plan threshold of 0.08 in/sec PPV at historic properties within 60 feet of the site, and the City's 0.2 in/sec PPV threshold would be exceeded at the nonhistorical building within 25 feet of the project site. This would be considered a significant impact.

TABLE 9 Vibration Source Levels for Construction Equipment

Equipment		PPV (in/sec)					
		Historical Buildings at 126 and 136 (5ft)	**Adj. Future Residential Building (5ft)**	**Historical Building at 118 (40ft)**	**Historical Building at 100 (80ft)**	**Historical Building North of Site (95ft)**	**City Hall (80ft)**
Clam shovel drop		**1.186**	**1.186**	**0.120**	0.056	0.047	0.056
Hydromill (slurry wall)	in soil	0.047	0.047	0.005	0.002	0.002	0.002
	in rock	**0.100**	0.100	0.010	0.005	0.004	0.005
Vibratory Roller		**1.233**	**1.233**	**0.125**	0.058	0.048	0.058
Hoe Ram		**0.523**	**0.523**	0.053	0.025	0.020	0.025
Large bulldozer		**0.523**	**0.523**	0.053	0.025	0.020	0.025
Caisson drilling		**0.523**	**0.523**	0.053	0.025	0.020	0.025
Loaded trucks		**0.446**	**0.446**	0.045	0.021	0.018	0.021
Jackhammer		**0.206**	**0.206**	0.021	0.010	0.008	0.010
Small bulldozer		0.018	0.018	0.002	0.001	0.001	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., September 2021.

FIGURE 3 Probability of Cracking and Fatigue from Repetitive Loading



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

Mitigation Measure 2:

The project shall implement the following measures, in addition to the best practices specified in Mitigation Measure 1a of this report, to minimize the impacts of groundborne vibration.

Construction Vibration Monitoring, Treatment, and Reporting Plan: The project proponent shall implement a construction vibration monitoring plan to document conditions prior to, during, and after vibration generating construction activities. All plan tasks shall be undertaken under the direction of a licensed Professional Structural Engineer in the State of California and be in accordance with industry-accepted standard methods. The construction vibration monitoring 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 and the anticipated time duration of using the equipment that is known to produce high vibration levels (clam shovel drops, vibratory rollers, hoe rams, large bulldozers, caisson drillings, loaded trucks, jackhammers, etc.) 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 demolition, earth-moving, and ground impacting operations so as not to occur during the same time period.

- Where possible, use of the heavy vibration-generating construction equipment shall be prohibited within 60 feet of any adjacent building.

- Document conditions at all historic structures located within 60 feet of construction and at all other buildings located within 25 feet of construction prior to, during, and after vibration generating construction activities. All plan tasks shall be undertaken under the direction of a licensed Professional Structural Engineer in the State of California and be in accordance with industry-accepted standard methods. Specifically:

    - Vibration limits shall be applied to vibration-sensitive structures located within 60 feet of any construction activities identified as sources of high vibration levels.

    - Performance of a photo survey, elevation survey, and crack monitoring survey for each historic structure within 60 feet of construction activities and all other buildings within 25 feet of construction activities. Surveys shall be performed prior to any construction activity, in regular intervals during construction, and after project completion, and shall include internal and external crack monitoring in structures, settlement, and distress, and shall document the condition of foundations, walls and other structural elements in the interior and exterior of said structures.

- Develop a vibration monitoring and construction contingency plan to identify structures where monitoring would be conducted, set up a vibration monitoring schedule, define structure-specific vibration limits, and address the need to conduct photo, elevation, and crack surveys to document before and after construction conditions. Construction contingencies shall be identified for when vibration levels approached the limits.

- At a minimum, vibration monitoring shall be conducted during demolition and excavation activities.

- If vibration levels approach limits, suspend construction and implement contingency measures to either lower vibration levels or secure the affected structures.

- Designate a person responsible for registering and investigating claims of excessive vibration. The contact information of such person shall be clearly posted on the construction site.

- Conduct a post-construction survey on structures where either monitoring has indicated high vibration levels or complaints of damage has been made. Make appropriate repairs or compensation where damage has occurred as a result of construction activities. The survey will be submitted to the Director of Planning Building and Code Enforcement, or Director's designee, and the City's Historic Preservation Officer (HPO).

Implementation of this mitigation measure would reduce the impact to a less-than-significant level.

Impact 3: **Excessive Aircraft Noise.** The project site is located less than 2 miles from Norman Y. 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.

Norman Y. Mineta San José International Airport is a public-use airport located approximately 1.7 miles northwest of the project site. According to the City's new Airport Master Plan Environmental Impact Report,[6] the project site lies outside the 60 dBA CNEL/DNL contour line (see Figure 4). 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 aircrafts. Therefore, the proposed project would be compatible with the City's exterior noise standards for aircraft noise.

Assuming standard construction materials, aircraft noise below 65 dBA DNL would result in future interior noise levels from aircraft below 50 dBA $L_{eq(1\text{-}hr)}$. 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.**

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

FIGURE 4 2037 CNEL Noise Contours for SJIA Relative to Project Site

Figure 5
Scenario 2: With Project 2037 Noise Contour Map

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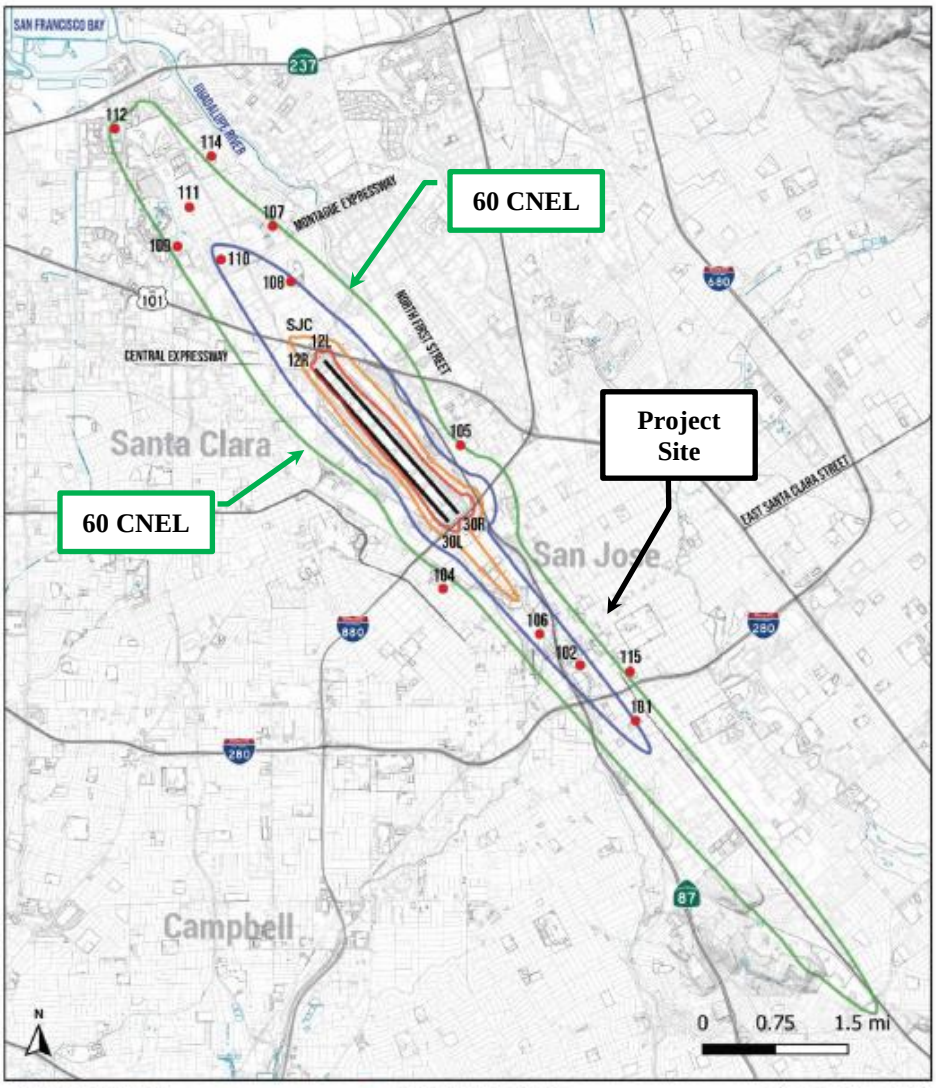

NORMAN Y. MINETA SAN JOSE INTERNATIONAL AIRPORT

- 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 would include temporary construction noise from cumulative construction projects. Cumulative traffic noise increases due to the proposed project was studied in the *Downtown San José Strategy Plan 2040 EIR.* Therefore, no further cumulative traffic noise increases would occur due to the proposed project.

From the City's website,[7] the following planned or approved projects are located within 1,000 feet of the proposed project:

- **Miro (SJSC Towers)** – this project is located at 39 North 5th Street, which is located approximately 125 feet northeast of the project site, in the northeastern corner of the North 4th Street/East Santa Clara Street intersection. This project is currently under construction and near completion. Construction of this project should be completed prior to construction of the SuZaCo BDG Mixed-Use Project. This would not result in a cumulative construction impact.

- **Icon-Echo** – this project is located at 147 East Santa Clara Street, which is north of the project, opposite East Santa Clara Street. This project would include the construction of two towers: a residential tower with 415 units and an office tower with 525,000 of office space. This project is currently in the planning review phase and not expected to start before January 2023. Therefore, there is potential for this project to occur simultaneously or consecutively with the proposed project. Further, the commercial properties west of the project site and west of the Icon-Echo site, as well as City Hall and the Miro Towers, would be shared receptors with both sites. This would potentially result in a cumulative construction impact.

- **Hotel Clariana** – this project is located at 27 South 4th Street, adjoining the project site to the west and to the southern. This project is currently under review and would consist of a five-story hotel and seven-story condominium building. Construction dates for this project have not been confirmed but would be expected to last for more than one year. The commercial uses west of the project site and City Hall would be shared receptors at both sites. This would potentially result in a cumulative construction impact.

- **Fourth Street Housing** – this project is in the northeast corner of the North 4th Street/East St. John Street intersection, approximately 720 feet north of the SuZaCo BDG Mixed-Use project site. This project has been approved and would consist of a 23-story mixed-use building with approximately 10,733 square feet of commercial uses and up to 316 residential units. Construction dates for this project have not been confirmed but due to the size of this building; however, the two project sites would not share any receptors. This would not result in a cumulative construction impact.

- **Fountain Alley** – this project is located at 35 South 2nd Street and would include a 21-story mixed-use building with 194 residential units and 405,000 square feet of office space and

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

31,959 square feet of ground-level retail. This project is currently in the planning review phase and not expected to start before March 2023. However, due to the location of this project site, with respect to the SuZaCo BDG Mixed-Use site, shared receptors are not expected. While some disruption may occur due to traffic lane closures or possibly redirected traffic, no existing receptors would be directly affected by construction at both project sites. This would not result in a cumulative construction impact.

- **Fountain Alley Office** – this project is located at 26 South 1st Street and would include construction of a 6-story commercial building with approximately 91,992 square feet of office and retail space. The Fountain Alley Office is approximately 710 feet from the Icon-Echo project site. This project has been approved, but construction has not started. Noise-sensitive receptors directly impacted by construction at this site would not be shared receptors at the SuZaCo BDG Mixed-Use site. Cumulative construction is therefore not assumed.

- **19 North 2nd Street** – this project is located northwest of the SuZaCo BDG Mixed-Use project site by approximately 585 feet. This mixed-use project would include 210 residential units and 37,240 square feet of commercial space. This project is currently in the planning review phase. Noise-sensitive receptors directly impacted by construction at this site would not be shared receptors at the SuZaCo BDG Mixed-Use site. Cumulative construction is therefore not assumed.

- **6th Street Project** – this project is located at 73 North 6th Street, approximately 735 feet east of the SuZaCo BDG Mixed-Use project site. This 10-story mixed-use building would include up to 197 residential units and approximately 8,000 square feet of ground floor retail. This project has been approved but not constructed. Noise-sensitive receptors directly impacted by construction at this site would not be shared receptors at the SuZaCo BDG Mixed-Use site. Cumulative construction is therefore not assumed.

- **27 West** – this project is located at 27 South 1st Street, which is about 925 feet west of the project site. This project has been approved and consists of a 22-story mixed-use building with 374 residential units and 35,712 square feet of retail space. Noise-sensitive receptors directly impacted by construction at this site would not be shared receptors at the SuZaCo BDG Mixed-Use site. Cumulative construction is therefore not assumed.

- **Eterna Tower** – this project is located at 17 East Santa Clara Street, which is about 660 feet northwest of the project site. This project is currently under review and consists of a mixed-use building with approximately 2,500 square feet of commercial space and 200 residential units (25% restricted affordable units for low-income residents). Noise-sensitive receptors directly impacted by construction at this site would not be shared receptors at the SuZaCo BDG Mixed-Use site. Cumulative construction is therefore not assumed.

The existing commercial buildings with direct line-of-sight to the project site, the future residents at the Miro Tower, and City Hall would potentially be impacted by on-going construction activities at the SuZaCo BDG Mixed-Use project site, the Icon-Echo project site, and the Hotel Clariana project site simultaneously or consecutively for several years. However, the identified project sites are each located within the boundary of the *Downtown San José Strategy Plan 2040 EIR*.

According to the Strategy Plan, implementation of the construction noise and vibration mitigation measures in combination with Policies EC-1.7 and EC-2.3 of the City's General Plan and the construction allowable hours identified in the City's Municipal Code would reduce construction occurring within the Plan Area to a less-than-significant impact. Each individual project includes measures to further reduce noise and vibration levels emanating from the individual sites. With the implementation of construction noise and vibration mitigation measures included in the *Downtown San José Strategy Plan 2040 EIR* and the construction noise and vibration mitigation measures from the individual projects, construction noise and vibration levels would be reduced as much as possible at all surrounding sensitive receptors during construction of each individual project. Therefore, potential cumulative construction impacts would be less-than-significant.

APPENDIX

FIGURE A1 Daily Trend in Noise Levels for LT-1 on Friday, November 30, 2018

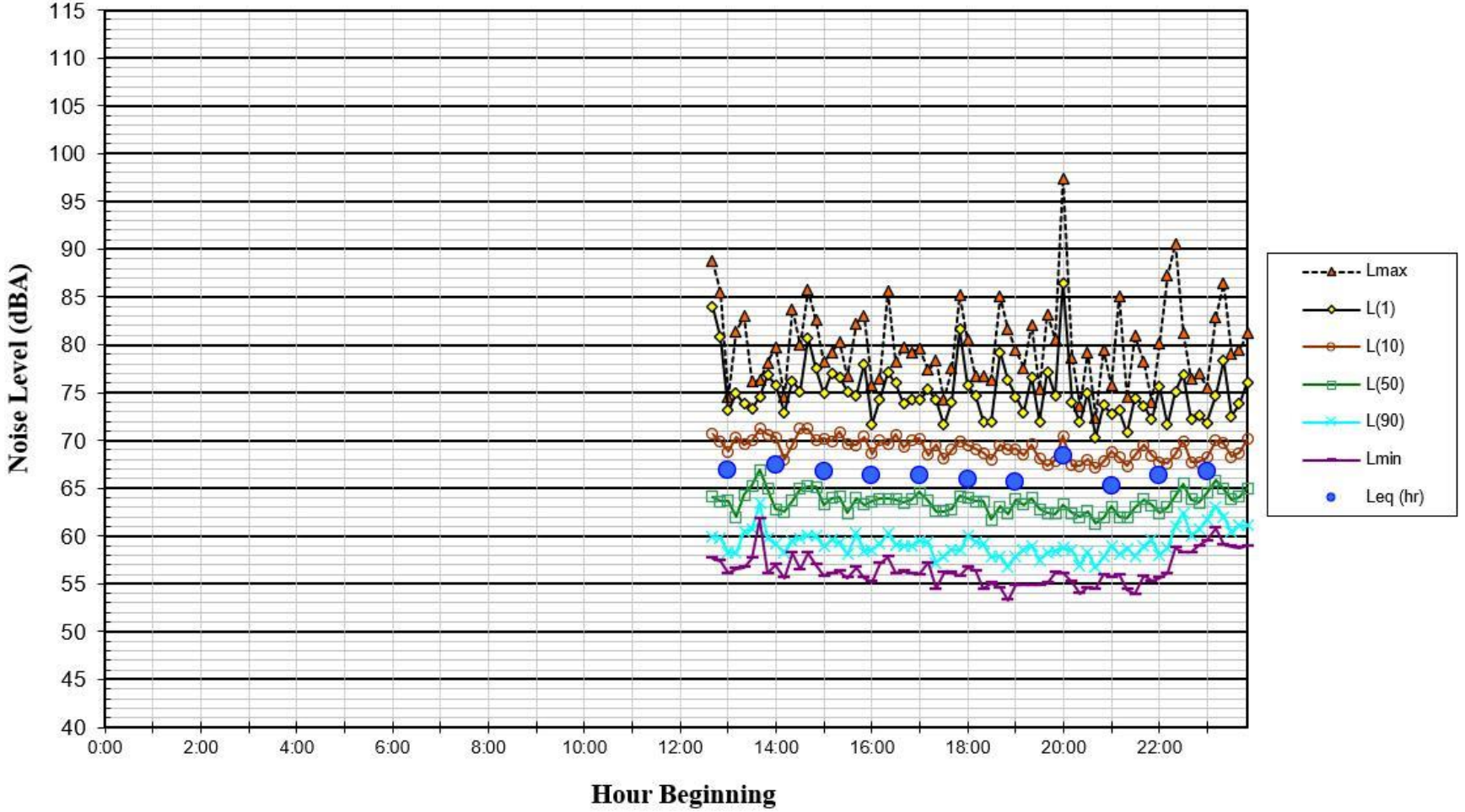

FIGURE A2 Daily Trend in Noise Levels for LT-1 on Saturday, December 1, 2018

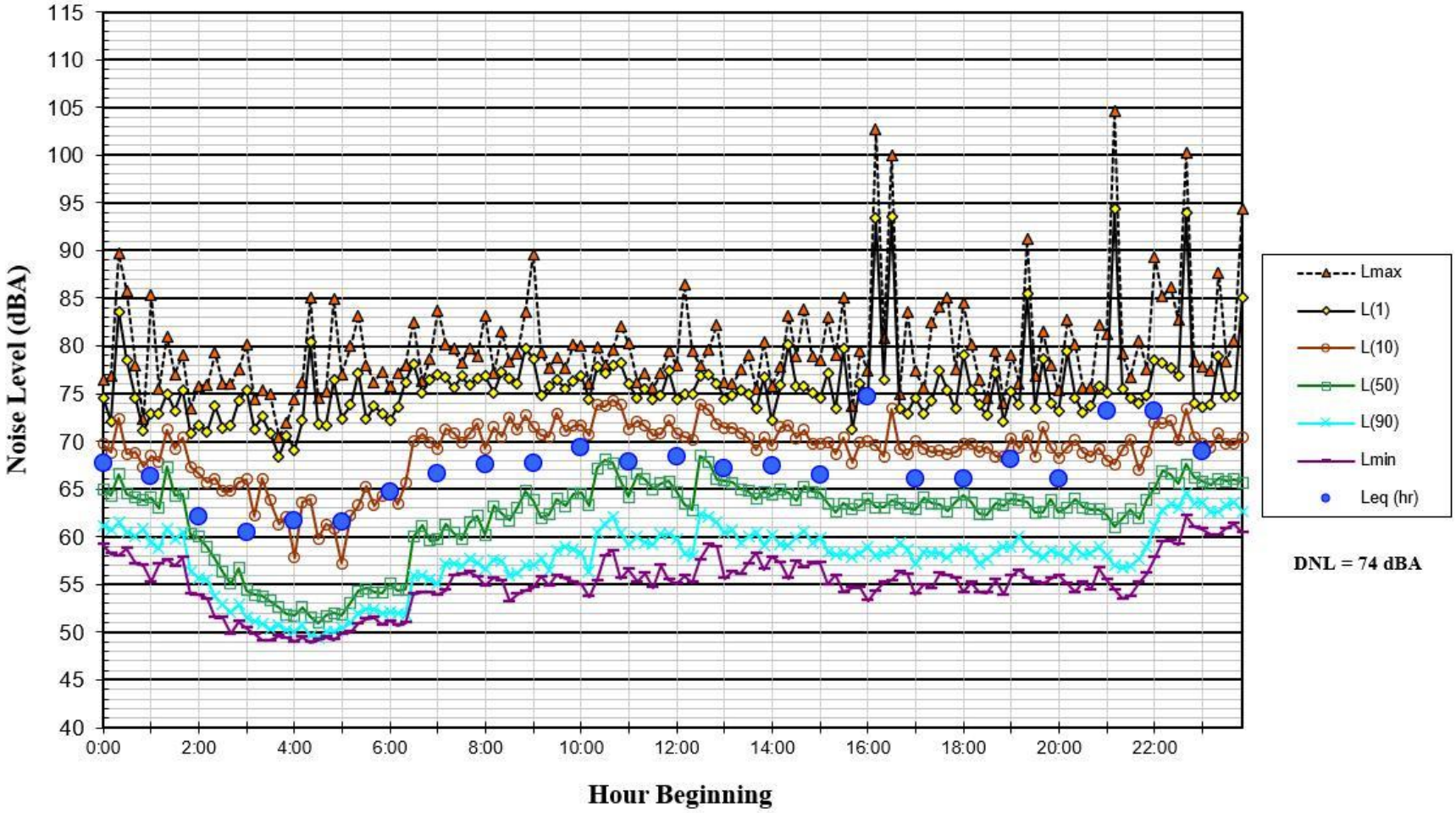

FIGURE A3 Daily Trend in Noise Levels for LT-1 on Sunday, December 2, 2018

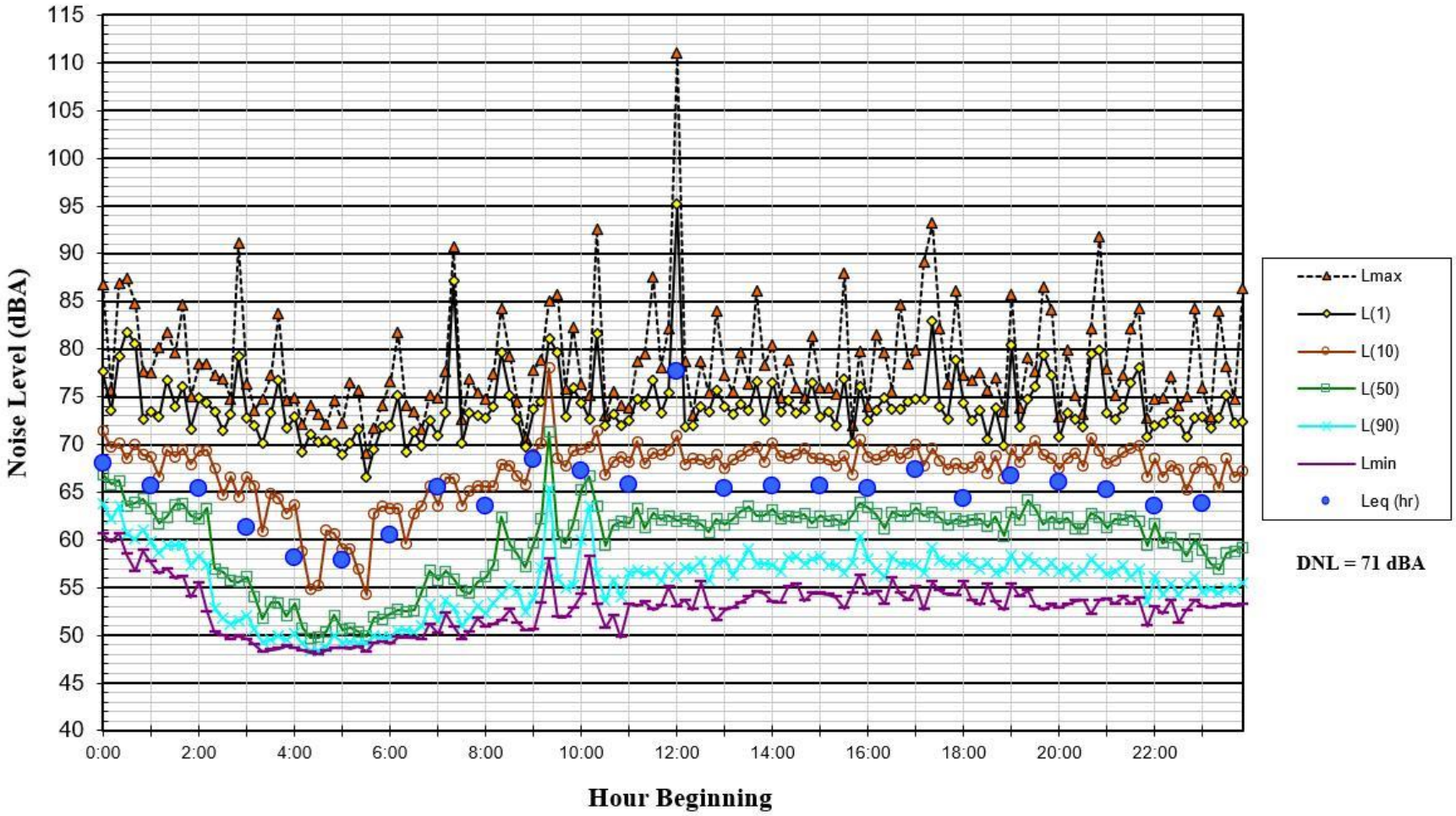

FIGURE A4 Daily Trend in Noise Levels for LT-1 on Monday, December 3, 2018

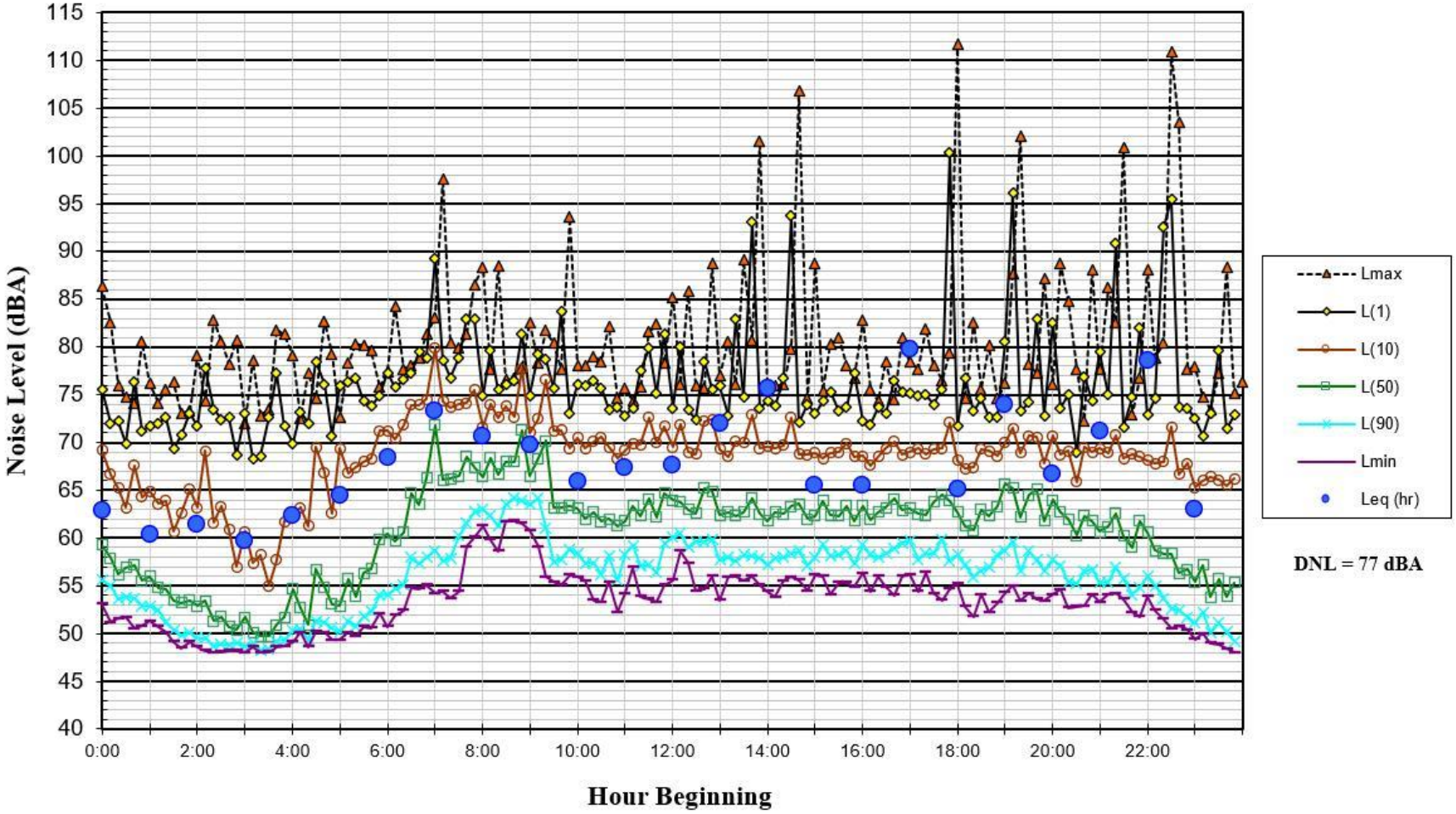

FIGURE A5 Daily Trend in Noise Levels for LT-2 on Friday, November 30, 2018

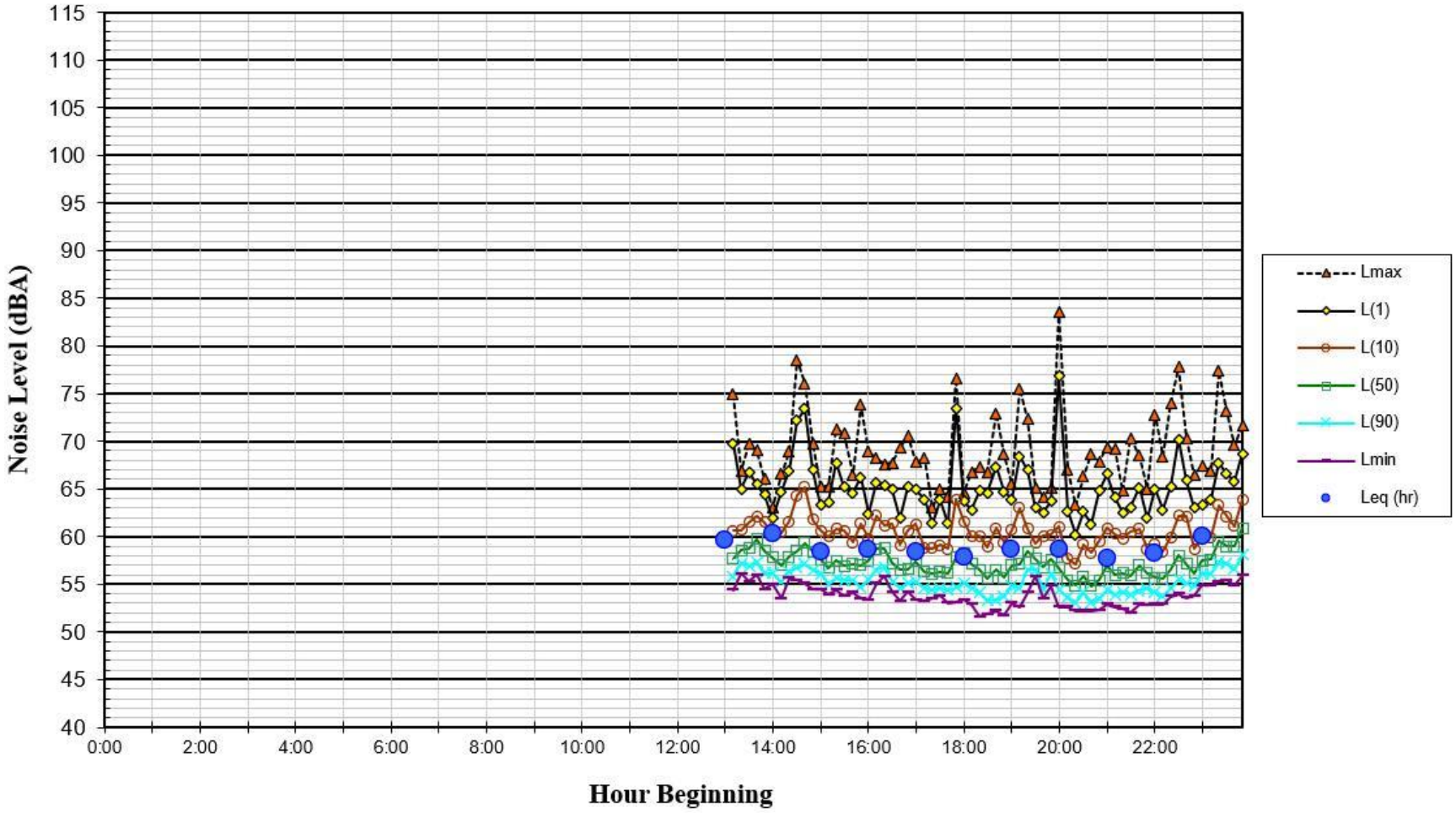

FIGURE A6 Daily Trend in Noise Levels for LT-2 on Saturday, December 1, 2018

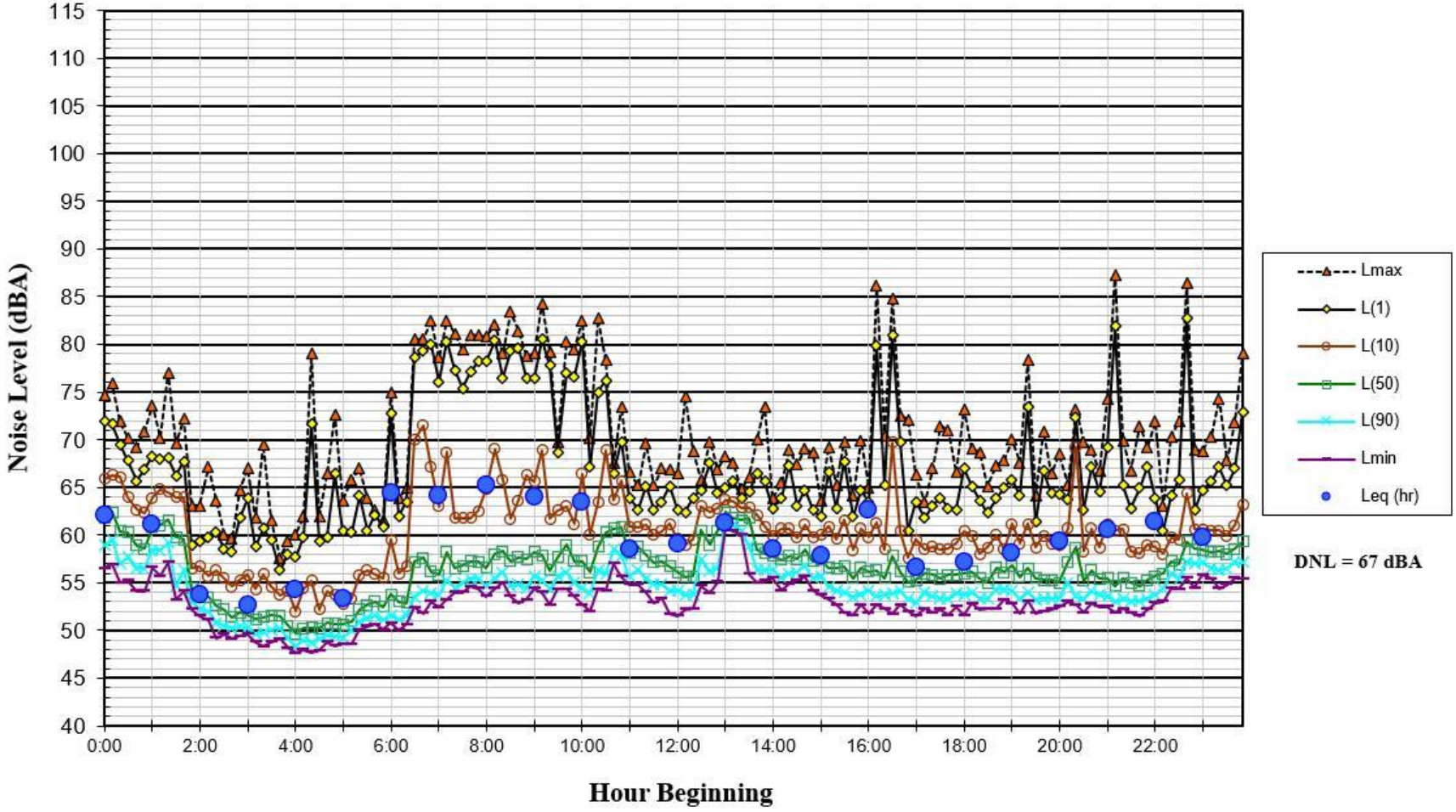

FIGURE A7 Daily Trend in Noise Levels for LT-2 on Sunday, December 2, 2018

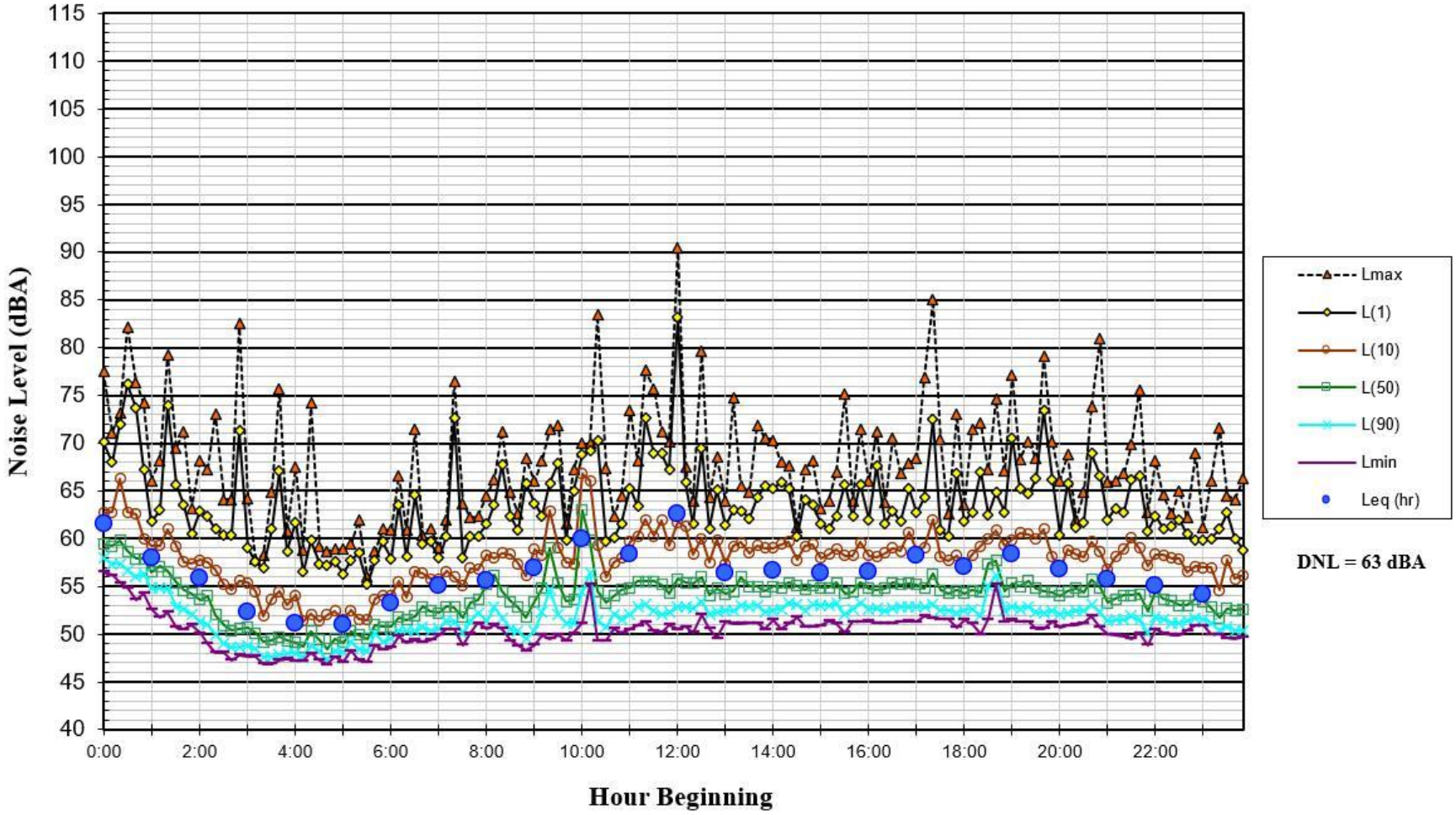

FIGURE A8 Daily Trend in Noise Levels for LT-2 on Monday, December 3, 2018