210 BAYPOINTE PARKWAY
NOISE AND VIBRATION ASSESSMENT

San José, California

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Prepared for:

Shannon George
Vice President & Principal Project Manager
David J. Powers & Associates, Inc.
1871 The Alameda, Suite 200
San José, CA 95126

Prepared by:

Micah Black
Michael S. Thill

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

I&R Job No.: 22-165

INTRODUCTION

The project proposes two residential developments at 210 Baypointe Parkway in San José, California. The 4.3-acre project site currently consists of a 67,984 square foot office/industrial building with surface parking lots. The existing buildings and parking lots would be demolished, and the land cleared for the new development. The development will include six three-story townhome buildings on the northeast half of the site, and a seven-story apartment building on the southwest half of the site. The townhome buildings and the apartment building will be separated by a centrally located outdoor paseo, providing pedestrian access between Baypointe Parkway along the northwest side of the site, and Casa Verde Street to the southeast of the site. Shared rooftop decks are planned for the apartment complex building along Baypointe Parkway. An outdoor podium courtyard is planned for the center of the apartment building, while a common open space area is planned for the center of the townhome complex. The apartment building will include a parking garage on the first floor and eight parking spaces located outside the resident gate, while the townhome complex will include garage parking, eight surface parking spaces, and eleven motorcycle parking spaces. A driveway along the northeast property line, connecting Baypointe Parkway and the private road along the southeast property line, would provide vehicular access to the townhome complex. Vehicular access to the apartment complex would be provided via Baypointe Parkway, where a driveway in the western corner of the project site will access the parking garage.

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 the intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales 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 p.m. to 10:00 p.m.) and a 10 dB addition to nocturnal (10:00 p.m. to 7:00 a.m.) noise levels. The *Day/Night Average Sound Level* (*DNL* or L_{dn}) is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

Effects of Noise

Sleep and Speech Interference

The thresholds for speech interference indoors are about 45 dBA if the noise is steady and above 55 dBA if the noise is fluctuating. Outdoors the thresholds are about 15 dBA higher. Steady noises of sufficient intensity (above 35 dBA) and fluctuating noise levels above about 45 dBA have been shown to affect sleep. Interior residential standards for multi-family dwellings are set by the State of California at 45 dBA DNL. Typically, the highest steady traffic noise level during the daytime is about equal to the DNL and nighttime levels are 10 dBA lower. The standard is designed for sleep and speech protection and most jurisdictions apply the same criterion for all residential uses. Typical structural attenuation is 12 to 17 dBA with open windows. With closed windows in good condition, the noise attenuation factor is around 20 dBA for an older structure and 25 dBA for a newer dwelling. Sleep and speech interference is therefore possible when exterior noise levels are about 57 to 62 dBA DNL with open windows and 65 to 70 dBA DNL if the windows are closed. Levels of 55 to 60 dBA are common along collector streets and secondary arterials, while 65 to 70 dBA is a typical value for a primary/major arterial. Levels of 75 to 80 dBA are normal noise levels at the first row of development outside a freeway right-of-way. In order to achieve an acceptable interior noise environment, bedrooms facing secondary roadways need to be able to have their windows closed, those facing major roadways and freeways typically need special glass windows.

Annoyance

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

TABLE 1 Definition of Acoustical Terms Used in this Report

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

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

TABLE 2 Typical Noise Levels in the Environment

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

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

Fundamentals of Groundborne Vibration

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One method is the Peak Particle Velocity (PPV). The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. In this report, a PPV descriptor with units of mm/sec or in/sec is used to evaluate construction generated vibration for building damage and human complaints. Table 3 displays the reactions of people and the effects on buildings that continuous or frequent intermittent vibration levels produce. The guidelines in Table 3 represent syntheses of vibration criteria for human response and potential damage to buildings resulting from construction vibration.

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

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

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

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

Railroad and light rail operations are potential sources of substantial ground vibration depending on distance, the type and the speed of trains, and the type of railroad track. People’s response to ground vibration from rail vehicles has been correlated best with the average, root mean square

(RMS) velocity of the ground. The velocity of the ground is expressed on the decibel scale. The reference velocity is 1 x 10-6 in/sec RMS, which equals 0 VdB, and 1 in/sec equals 120 VdB. Although not a universally accepted notation, the abbreviation "VdB" is used in this document for vibration decibels to reduce the potential for confusion with sound decibels.

Typical background vibration levels in residential areas are usually 50 VdB or lower, well below the threshold of perception for most humans. Perceptible vibration levels inside residences are attributed to the operation of heating and air conditioning systems, door slams and foot traffic. Construction activities, train operations, and street traffic are some of the most common external sources of vibration that can be perceptible inside residences. Table 4 illustrates some common sources of vibration and the association to human perception or the potential for 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.

TABLE 4 Typical Levels of Groundborne Vibration

Human/Structural Response	Velocity Level, VdB	Typical Events (50-foot setback)
Threshold, minor cosmetic damage	100	Blasting, pile driving, vibratory compaction equipment
		Heavy tracked vehicles (Bulldozers, cranes, drill rigs)
Difficulty with tasks such as reading a video or computer screen	90	
		Commuter rail, upper range
Residential annoyance, infrequent events	80	Rapid transit, upper range
Residential annoyance, occasional events		Commuter rail, typical Bus or truck over bump or on rough roads
Residential annoyance, frequent events	70	Rapid transit, typical
Approximate human threshold of perception to vibration		Buses, trucks and heavy street traffic
	60	
		Background vibration in residential settings in the absence of activity
Lower limit for equipment ultra-sensitive to vibration	50	

Source: Transit Noise and Vibration Impact Assessment, US Department of Transportation Federal Transit Administration, September 2018.

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.

Federal

Federal Transit Administration. The Federal Transit Administration (FTA) has identified construction noise thresholds in the *Transit Noise and Vibration Impact Assessment Manual*,[1] which limit daytime construction noise to 80 dBA L_{eq} at residential land uses and to 90 dBA L_{eq} at commercial and industrial land uses.

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

State of California

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

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

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

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

2022 California Building Code, Title 24, Part 2. The current version of the California Building Code (CBC) requires interior noise levels in multi-family residential units attributable to exterior environmental noise sources to be limited to a level not exceeding 45 dBA DNL/CNEL in any habitable room.

Santa Clara County

Santa Clara County Airport Land Use Commission Comprehensive Land Use Plan. The Comprehensive Land Use Plan (CLUP) adopted by the Santa Clara County Airport Land Use Commission contains standards for projects within the vicinity of San José 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:

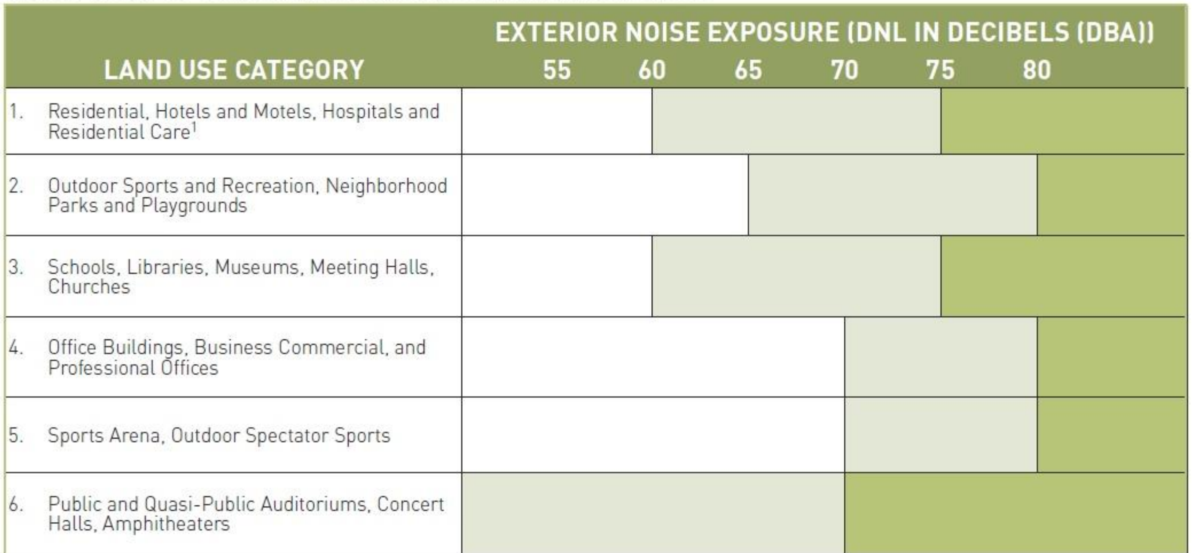
Interior Noise Levels

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

Exterior Noise Levels

- The City's acceptable exterior noise level objective is 60 dBA DNL or less for residential and most institutional land uses (Table EC-1). The acceptable exterior noise level objective is established for the City, except in the environs of the San José International Airport and the Downtown, as described below:
    - For new multi-family residential projects and for the residential component of mixed-use development, use a standard of 60 dBA DNL in usable outdoor activity areas, excluding balconies and residential stoops and porches facing existing roadways. Some common use areas that meet the 60 dBA DNL exterior standard will be available to all residents. Use noise attenuation techniques such as shielding by buildings and structures for outdoor common use areas. On sites subject to aircraft overflights or adjacent to elevated roadways, use noise attenuation techniques to achieve the 60 dBA DNL standard for noise from sources other than aircraft and elevated roadway segments.

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



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

Normally Acceptable:

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

Conditionally Acceptable:

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

Unacceptable:

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

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

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

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

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

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

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

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 210 Baypointe Parkway in the City of San José. The project site is bordered by Baypointe Parkway, the University of Silicon Valley, and an apartment building to the northwest, a vacant lot to the northeast, a private road and apartment buildings to the southeast, and an apartment building to the southwest. The noise environment at the site and in the surrounding area results primarily from local vehicular traffic along Baypointe Parkway, background vehicular traffic on East Tasman Drive and Zanker Road, and aircraft associated with Norman Y. Mineta San José International Airport.

A noise monitoring survey consisting of two long-term noise measurements (LT-1 and LT-2) and two short-term noise measurements (ST-1 and ST-2) was completed between Tuesday, December 13, 2022, and Thursday, December 15, 2022. All noise measurement locations are shown in Figure 1.

Long-term noise measurement LT-1 was approximately 50 feet southeast of the centerline of Baypointe Parkway. Hourly average noise levels at LT-1 typically ranged from 57 to 64 dBA L_{eq} during daytime hours (7:00 a.m. to 10:00 p.m.) and from 47 to 59 dBA L_{eq} during nighttime hours (10:00 p.m. to 7:00 a.m.). The day-night average noise level on Wednesday, December 14, 2022, was 62 dBA DNL. The main source of noise at this location was traffic along Baypointe Parkway. The daily trend in noise levels at LT-1 is shown in Figures A1 through A3 of Appendix A.

Long-term noise measurement LT-2 was located approximately 15 feet northwest of the centerline of the private road along the southeast side of the property. Hourly average noise levels at LT-2 typically ranged from 52 to 59 dBA L_{eq} during daytime hours and from 44 to 55 dBA L_{eq} during nighttime hours. Abnormal hourly average noise levels ranging from 59 to 76 dBA L_{eq} were produced by landscaping and garbage removal activities. The day-night average noise level on Wednesday, December 14, 2022, was 59 dBA DNL. The main source of noise at this location was background traffic along East Tasman Drive, with local traffic, aircraft, and apartment complex operations also contributing to the noise environment. The daily trend in noise levels at LT-2 is shown in Figures A4 through A6 of Appendix A.

Short-term noise measurement ST-1 was conducted on Tuesday, December 13, 2022, between 12:40 p.m. and 12:50 p.m. As shown in Figure 1, location ST-1 was approximately 190 feet southeast of the centerline of Baypointe Parkway, along the southwest property line of the project site. The main sources of noise at this location were traffic along Baypointe Parkway and aircraft, and the 10-minute average noise level was 53 dBA L_{eq}. Twenty-three light vehicles on Baypointe Parkway produced maximum noise levels ranging from 49 to 61 dBA L_{max}. Aircraft produced maximum noise levels ranging from 53 to 60 dBA L_{max}.

Short-term noise measurement ST-2 was conducted on Tuesday, December 13, 2022, between 1:00 p.m. and 1:10 p.m. southeast of the site along Casa Verde Street. This noise environment at this location resulted from a combination of sources including vehicular traffic and truck deliveries, pedestrian activities, light rain trains, and aircraft. The 10-minute average noise level measured at this location was 60 dBA L_{eq}. Small vehicles produced maximum noise levels ranging from 49 to 63 dBA L_{max}, while box trucks produced noise levels ranging from 59 to 77 dBA L_{max}.

Aircraft produced maximum noise levels ranging from 54 to 59 dBA L_{max}. Pedestrian activities, such as talking and unloading vehicles, produced noise levels ranging from 52 to 75 dBA L_{max}. Table 5 summarizes the noise levels from the short-term noise measurements.

TABLE 5 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: ~190 feet southeast of the centerline of Baypointe Parkway	12/13/2022, 12:40-12:50	61	59	56	51	47	53
ST-2: ~30 feet northeast of the centerline of Casa Verde Street	12/13/2022, 13:00-13:10	77	71	63	55	50	60

The noise survey results establish existing conditions for receptors near the ground. Measured noise from SR 237 and East Tasman Drive affecting the project site and vicinity is shielded by the intervening apartment buildings. The noise study completed for the *Envision San José 2040 General Plan Comprehensive Update EIR*[2] includes noise exposure contours for major roadways and highways. These contours, that do not account for acoustical shielding, show that the existing noise exposure in the vicinity of the project site is about 60 to 65 dBA DNL, representing the existing noise exposure at the upper floors of the proposed project nearest to SR 237 and East Tasman Drive.

[2] *Envision San José 2040 General Plan Comprehensive Update EIR*, State Clearinghouse Number 2009072096, File number PP09-011, June 2011.

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

Source: Google Earth, 2023.

PLAN CONSISTENCY ANALYSIS

Noise and Land Use Compatibility

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

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

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

The future noise environment at the site would continue to result primarily from local vehicular traffic along Baypointe Parkway and East Tasman Drive, as well as from aircraft noise and nearby apartment complex operations. The traffic study completed for the proposed project included peak hour traffic volumes along Baypointe Parkway and Tasman Drive. Comparing the cumulative plus project traffic volumes to the existing traffic volumes resulted in a 1 dBA DNL increase under future conditions along East Tasman Drive and a 3 dBA DNL increase under future conditions along Baypointe Parkway. According to the *Envision San José 2040 General Plan Comprehensive Update EIR*, the traffic noise level increase at the project site, based on future volumes along East Tasman Drive, could be up to 4 dBA DNL by the year 2035. Assuming worst-case conditions, a future noise level increase at the project site would be 4 dBA DNL.

Future Exterior Noise Environment

Private balconies, decks, and front yards would not be considered outdoor use areas subject to the exterior noise thresholds. Common use areas including the 3rd level central courtyard area of the apartment building would be subject to the City's thresholds. The courtyard is to be completely enclosed by the building itself, which would greatly reduce noise levels from local traffic. Future exterior noise levels within the courtyard are calculated to be 51 dBA DNL or less. Future exterior noise levels at the paseo would range from approximately 63 dBA DNL at the private road, to 58 dBA DNL at the midpoint, and 66 dBA DNL at Baypointe Road. Portions of this area would be subject to noise levels exceeding the City's 60 dBA DNL threshold without additional noise control. If areas of the paseo are considered to be noise-sensitive, then formalized use areas should be located 55 feet or more from the private road, and 85 feet or more from Baypointe Parkway. If the paseo will not be used for noise-sensitive outdoor activities, no noise control measures would be needed. Level 7 of the apartment building is to include rooftop decks at the northeast and southeast corners of the building, and a dog park on the east side of the building. These outdoor areas would be shielded from the traffic noise below by the building itself and are expected to have future exterior noise levels ranging from 45 to 53 dBA DNL. Future noise levels at all outdoor use areas would be below the City's threshold of 60 dBA DNL.

Future Interior Noise Environment

Standard residential construction provides approximately 15 dBA of exterior-to-interior noise reduction, assuming the windows are partially open for ventilation. Standard construction with the windows closed provides approximately 20 to 25 dBA of noise reduction in interior spaces. Where exterior noise levels range from 60 to 65 dBA DNL, the inclusion of adequate forced-air mechanical ventilation is often the method selected to reduce interior noise levels to acceptable levels by closing the windows to control noise. Where noise levels exceed 65 dBA DNL, forced-air mechanical ventilation systems and sound-rated construction methods are normally required. Such methods or materials may include a combination of smaller window and door sizes as a percentage of the total building façade facing the noise source, sound-rated windows and doors, sound rated exterior wall assemblies, and mechanical ventilation so windows may be kept closed at the occupant's discretion.

The northwestern façade of the buildings along Baypointe Parkway would be set back approximately 50 feet from the centerline of the roadway. At this distance, the lower-level units would be exposed to future exterior noise levels up to 66 dBA DNL. Assuming windows to be partially open, future interior noise levels in these units would be up to 51 dBA DNL.

The southeastern façade of the buildings along the private road would be set back approximately 25 feet from the centerline of the roadway. At this distance, the lower-level units would be exposed to future exterior noise levels up to 63 dBA DNL. Assuming windows to be partially open, future interior noise levels in these units would be up to 48 dBA DNL.

The southwestern and northeastern façades would be exposed to future exterior noise levels ranging from 58 to 63 dBA DNL. Assuming windows to be partially open, future interior noise levels in these units would range from 43 to 48 dBA DNL. To meet the interior noise requirements set forth by the City of San José of 45 dBA DNL, implementation of noise insulation features would be required.

Noise Insulation Features to Reduce Future Interior Noise Levels

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

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

- Preliminary calculations indicate that all residential units along the northwestern building façades would require windows and doors with a minimum rating of 26 STC with adequate forced-air mechanical ventilation to meet the interior noise threshold of 45 dBA DNL.

- Preliminary calculations indicate that residential units located along the southeastern façades would require windows and doors with a minimum rating of 26 STC with adequate forced-air mechanical ventilation to meet the interior noise threshold of 45 dBA DNL.

- Preliminary calculations indicate that residential units located along the northeastern and southwestern façades would require windows and doors with a minimum rating of 26 STC with adequate forced-air mechanical ventilation to meet the interior noise threshold of 45 dBA DNL.

The implementation of these noise insulation features would reduce interior noise levels to 45 dBA DNL or less at residential uses.

Conditions of Approval

The project applicant shall prepare final design plans that incorporate building design and acoustical treatments to ensure compliance with State Building Codes and City noise standards. The design shall incorporate controls to reduce interior noise levels to 45 dBA DNL or lower within the residential units. The project shall conform with any special building construction techniques requested by the City's Building Department, which may also include sound-rated windows and doors, sound-rated wall constructions, and acoustical caulking.

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 substantially and exceed the FTA guidance level of 80 dBA L_{eq} at nearby sensitive receptors. The City of San José considers the impact of 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 construction noise over a period of more than one year. According to the City's General Plan, this temporary noise increase would be **significant**.

The construction schedule assumed that construction would start early-January 2025 and the project would be built out over a period of approximately two years. Construction phases would include demolition, site preparation, grading, trenching, building construction, architectural coating, and paving. During each phase of construction, there would be a different mix of equipment operating, and noise levels would vary by phase and vary within phases, based on the amount of equipment in operation and the location at which the equipment is operating.

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

Policy EC-1.7 of the City's General Plan requires that all construction operations within the City use best available noise suppression devices and techniques and to limit construction hours near residential uses per the Municipal Code allowable hours, 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 located within 500 feet of residential uses or 200 feet of commercial or office uses and 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.

While the City of San José does not establish noise level thresholds for construction activities, this analysis uses the noise limits established by the Federal Transit Administration (FTA) to identify the potential for impacts due to substantial temporary construction noise. The FTA identifies construction noise limits in the *Transit Noise and Vibration Impact Assessment Manual*.[3] During

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

daytime hours, an exterior threshold of 80 dBA L_{eq} shall be enforced at residential land uses and 90 dBA L_{eq} shall be enforced at commercial and industrial land uses.

Construction activities generate considerable amounts of noise, especially during earth-moving activities when heavy equipment is used. The hauling of excavated materials and construction materials would generate truck trips on local roadways, as well. For the proposed project, pile driving, which generates excessive noise levels, would not occur. 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 6) from the equipment. Table 7 shows the hourly average noise level ranges, by construction phase, typical for various types of projects. Hourly average noise levels generated by construction are about 65 to 88 dBA L_{eq} for residential buildings, measured at a distance of 50 feet from the center of a 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.

TABLE 6 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

Equipment Category	L_{max} Level (dBA)[1,2]	Impact/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 7 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

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

Tables 8 and 9 show the equipment expected to be used and the calculated hourly average noise levels at 50 feet during each phase of construction for the apartment component and the townhome component of the project, assuming the operation of the two loudest pieces of construction equipment for each construction stage. During construction of the apartment component, noise levels at 50 feet would intermittently range from 77 to 86 dBA L_{eq}. During construction of the townhome component, noise levels at 50 feet would intermittently range from 76 to 86 dBA L_{eq}.

RCNM was also used to calculate the hourly average noise levels emanating from the acoustical center of the construction sites, assuming all equipment would operate simultaneously. Tables 10 and 11 show the range of expected construction noise levels at nearby noise-sensitive receptors for the construction of the apartment component and the townhome component of the project.

TABLE 8 Estimated Construction Noise Levels for the Apartment Building at a Distance of 50 feet

Phase of Construction	Total Workdays	Construction Equipment (Quantity)	Estimated Construction Noise Level at 50 feet
Demolition	30 days	Concrete/Industrial Saw (2) [aa] Excavator (2) Rubber-Tired Dozer (3) Tractor/Loader/Backhoe (3)	86 dBA L_{eq}
Site Preparation	5 days	Grader (1) [a] Rubber-Tired Dozer (1) [a] Tractor/Loader/Backhoe (2)	83 dBA L_{eq}
Grading / Excavation	15 days	Excavator (2) Grader (1) [a] Rubber-Tired Dozer (1) Concrete/Industrial Saw (1) [a] Tractor/Loader/Backhoe (2)	85 dBA L_{eq}
Trenching / Foundation	60 days	Tractor/Loader/Backhoe (2) [a] Excavator (1) [a]	78 dBA L_{eq}
Building – Exterior	180 days	Crane (2) Forklift (5) Generator Set (4) [aa] Tractor/Loader/Backhoe (2) Welder (5)	81 dBA L_{eq}
Building – Interior/ Architectural Coating	120 days	Air Compressor (3) [aa] Aerial Lift (1)	77 dBA L_{eq}
Paving	25 days	Cement and Mortar Mixer (2) [a] Paver (1) [a] Paving Equipment (1) Roller (1) Tractor/Loader/Backhoe (2)	78 dBA L_{eq}

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

TABLE 9 Estimated Construction Noise Levels for the Townhome Complex at a Distance of 50 feet

Phase of Construction	Total Workdays	Construction Equipment (Quantity)	Estimated Construction Noise Level at 50 feet
Demolition	30 days	Concrete/Industrial Saw (2) [aa] Excavator (2) Rubber-Tired Dozer (3) Tractor/Loader/Backhoe (3)	86 dBA L_{eq}
Grading / Excavation	15 days	Excavator (2) Grader (1) [a] Rubber-Tired Dozer (1) Concrete/Industrial Saw (1) [a] Tractor/Loader/Backhoe (2)	85 dBA L_{eq}
Trenching	60 days	Tractor/Loader/Backhoe (2) [a] Excavator (1) [a]	78 dBA L_{eq}
Fine Grading / Paving	15 days	Grader (1) [a] Scraper (1) [a] Tractor/Loader/Backhoe (1) Roller (2) Paver (1)	83 dBA L_{eq}
Building – Foundation	18 days	Tractor/Loader/Backhoe (2) [aa]	77 dBA L_{eq}
Building – Exterior	182 days	Crane (1) [a] Forklift (1) Tractor/Loader/Backhoe (1) [a]	76 dBA L_{eq}
Building – Interior/ Architectural Coating	182 days	Air Compressor (5) [aa]	77 dBA L_{eq}

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

TABLE 10 Estimated Construction Noise Levels for the Apartment Building – Measured from the Acoustical Center of the Construction Site

Phase of Construction	Calculated Hourly Average Noise Levels, L_{eq} (dBA)				
	Southeast Residential (170 feet)	Southwest Residential (180 feet)	West Residential (190 feet)	North School (200 feet)	East Residential (280 feet)
Demolition	78	77	77	76	74
Site Preparation	73	73	72	72	69
Grading / Excavation	76	76	76	75	72
Trenching / Foundation	69	69	68	68	65
Building – Exterior	75	75	74	74	71
Building – Interior/ Architectural Coating	68	68	67	67	64
Paving	72	71	71	71	70

TABLE 11 Estimated Construction Noise Levels for the Townhome Complex – Measured from the Acoustical Center of the Construction Site

Phase of Construction	Calculated Hourly Average Noise Levels, L_{eq} (dBA)				
	Southeast Residential (260 feet)	Southwest Residential (510 feet)	West Residential (400 feet)	North School (195 feet)	East Residential (175 feet)
Demolition	74	68	70	77	78
Grading / Excavation	73	67	69	75	76
Trenching	65	60	62	68	69
Fine Grading / Paving	71	65	67	73	74
Building – Foundation	62	56	59	65	66
Building – Exterior	62	57	59	65	66
Building – Interior/ Architectural Coating	66	61	63	69	70

Nearby residences located along Baypointe Parkway would have existing ambient noise levels represented by LT-1 of the monitoring survey, which ranged from 57 to 64 dBA L_{eq} during daytime hours. The existing residences to the southwest of the project site and set back from Baypointe Parkway by up to 190 feet would have ambient noise levels represented by ST-1, which was measured at 53 dBA L_{eq} during the daytime. Residential properties located along the private road southeast of the site would have existing ambient noise levels represented by LT-2 of the monitoring survey, which ranged from 52 to 59 dBA L_{eq} during daytime hours. Other residential properties in the vicinity, such as apartments along Casa Verde Street, would have ambient noise levels represented by ST-2, which was measured at 60 dBA L_{eq} during the daytime.

As shown Table 10, during the construction of the apartment building component, the range of expected hourly average noise levels at the existing apartment building to the southwest of the project site are projected to range from 68 to 77 dBA L_{eq}. The outdoor courtyard area at this receptor's location will be completely shielded from construction noise by the building itself. Expected hourly average noise levels at the existing apartment building to the southeast are projected to range from 68 to 78 dBA L_{eq}. Similarly, the outdoor courtyard area at this receptor's location will be completely shielded from construction noise by the building itself. Expected hourly average noise levels at the existing apartment building to the east, which also includes a shielded courtyard area, are projected to range from 64 to 74 dBA L_{eq}. Expected hourly average noise levels at the existing apartment building to the west, which includes a shielded courtyard area as well, are projected to range from 67 to 77 dBA L_{eq}. And the expected hourly average noise levels at the existing school building to the north are projected to range from 67 to 76 dBA L_{eq}.

As shown Table 11, during the construction of the townhome complex component, the range of expected hourly average noise levels at the existing apartment building to the southwest of the project site are projected to range from 56 to 68 dBA L_{eq}. Expected hourly average noise levels at the existing apartment building to the southeast are projected to range from 62 to 74 dBA L_{eq}. Expected hourly average noise levels at the existing apartment building to the east are projected to range from 66 to 78 dBA L_{eq}. Expected hourly average noise levels at the existing apartment building to the west are projected to range from 59 to 70 dBA L_{eq}. And the expected hourly average noise levels at the existing school building to the north are projected to range from 65 to 77 dBA L_{eq}.

Since project construction is located within 500 feet of existing residential uses, would last for a period of more than one year, and noise levels would intermittently exceed 80 dBA L_{eq} when construction equipment is being used along property lines, this temporary construction impact would be considered significant in accordance with Policy EC-1.7 of the City's General Plan.

Mitigation Measure 1a: Pursuant to General Plan Policy EC-1.7, a construction noise logistics plan shall be prepared 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. Project construction operations shall use best available noise suppression devices and techniques including, but not limited to the following:

- Limit construction hours to between 7:00 AM and 7:00 PM, Monday through Friday, unless permission is granted with a development permit or other planning approval. No construction activities are permitted on the weekends at sites within 500 feet of a residence. Construction outside of these hours may be approved through a development permit based on a site-specific “construction noise mitigation plan” and a finding by the Director of PBCE that the construction noise mitigation plan is adequate to prevent noise disturbance of affected residential uses.

- Construct solid plywood fences around construction sites adjacent to operational business, residences, or other noise-sensitive land uses. In order to limit daytime construction noise to 80 dBA L_{eq} at residential land uses, temporary 8-foot noise barriers shall be constructed along the southeast property line and a portion of the northwest property line of the project site to shield adjacent residential buildings within 100 feet of the property lines from ground-level construction equipment and activities. The noise barrier shall be solid over the face and at the base of the barrier in order to provide a 5 dBA noise reduction. The first floor of the residential building to the southwest is a parking garage, and a noise barrier is not needed in this location. Figure 2 below shows the recommended locations of the noise barriers.

- Equip all internal combustion engine-driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.

- Prohibit unnecessary idling of internal combustion engines.

- Locate stationary noise-generating equipment such as air compressors or portable power generators as far as possible from sensitive receptors. Construct temporary noise barriers to screen stationary noise-generating equipment when located near adjoining sensitive land uses.

- Utilize “quiet” air compressors and other stationary noise sources where technology exists.

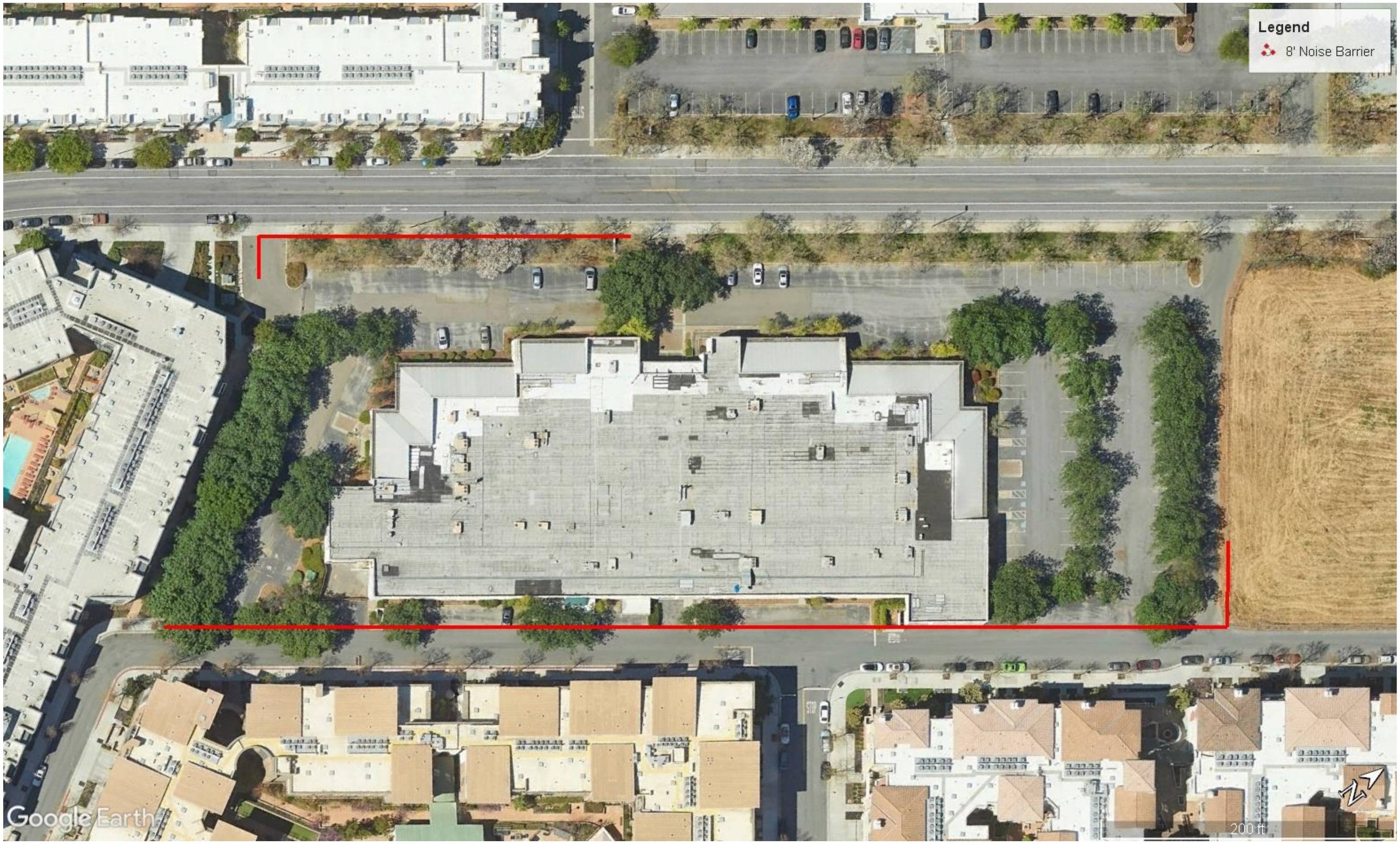
- Control noise from construction workers’ radios to a point where they are not audible at existing residences bordering the project site.

- Notify all adjacent business, residences, and other noise-sensitive land uses of the construction schedule, in writing, and provide a written schedule of “noisy” construction activities to adjacent land uses and nearby residences.

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

With the implementation of GP Policy EC-1.7, Zoning Code requirements, and the above measures, the temporary construction noise impact would be **less-than-significant**.

FIGURE 2 Aerial Image Showing the Proposed Locations of Temporary Construction Noise Barriers



Source: Google Earth, 2023.

Impact 1b: Permanent Noise Level Increase/Exceed Applicable Standards. The proposed project would not result in a substantial permanent noise level increase at the noise-sensitive receptors in the project vicinity. Further, operational noise levels generated by the proposed project would not exceed applicable standards established by the City of San José. This is a **less-than-significant** impact.

According to Policy EC-1.2 of the City's General Plan, a significant permanent noise increase would occur if the project would substantially increase noise levels at existing sensitive receptors in the project vicinity. A substantial increase would occur if: a) the noise level increase is 5 dBA DNL or greater, with a future noise level of less than 60 dBA DNL at residences; or b) the noise level increase is 3 dBA DNL or greater, with a future noise level of 60 dBA DNL or greater at residences. Noise levels at sensitive land uses exceed 60 dBA DNL along Baypointe Parkway; therefore, a significant impact would occur if traffic or operational noise due to the proposed project would permanently increase ambient levels by 3 dBA DNL at these locations. Noise levels at other adjacent sensitive land uses do not exceed 60 dBA DNL; therefore, a significant impact would occur if traffic or operational noise due to the proposed project would permanently increase ambient levels by 5 dBA DNL at these locations.

The City's General Plan does not include thresholds for equipment noise generated at residential buildings; however, the Municipal Code requires mechanical equipment noise to be maintained at or below 55 dBA at receiving residential properties when operational noise is generated at residential uses. Additionally, Section 20.40.600 of the Municipal Code includes a noise limit of 60 dBA on receiving nonresidential uses.

Project Traffic Increase

The traffic study included peak hour turning movements for the existing traffic volumes and existing plus project traffic volumes at eight intersections in the vicinity of the project sites. By comparing the existing plus project traffic scenario to the existing scenario, the total contribution of the project to the overall noise level increase was determined to be 2 dBA DNL along Baypointe Parkway. All other roadway segments in the project vicinity would see a DNL increase of less than 1 dBA. Therefore, the project would not result in a permanent noise increase of 3 dBA DNL or more at noise-sensitive receptors in the project vicinity.

Mechanical Equipment

The site plan shows enclosed trash areas on the ground level of the southern corner and east corner of the apartment building. Also at the southern corner of the building, the site plan also shows two transformers located on the ground level, as well as a loading area.

480-watt transformers typically generate noise levels up to 47 dB, as measured at 3 feet. Assuming the transformer runs continuously during daytime and nighttime hours, the day-night average noise level would be 53 dBA DNL at a distance of 3 feet. At the nearest property line, the DNL would be 45 dBA from the combined noise from the two transformers, well below the 55 dBA DNL threshold. Noise levels from the transformers would be less than 55 dBA DNL at all other property lines in the vicinity.

The architectural roof plan and floor plans were used to determine the approximate locations of the equipment on the roof shown to be 75 feet above grade. The predicted HVAC noise levels at nearby buildings were calculated. It is assumed that all equipment will run simultaneously. The rooftop itself, as well as the planned three-foot parapet wall and the intervening distance will reduce noise levels at nearby properties. The calculated mechanical equipment noise levels are 47 dBA L_{eq} at the residential buildings to the southwest and southeast, 38 dBA L_{eq} at the residential building to the east, 43 dBA L_{eq} at the residential building to the west, 36 dBA L_{eq} at the school building to the north, and 43 dBA L_{eq} at the future residential building to the northeast. Noise levels from the rooftop equipment would be less than 55 dBA DNL at all other property lines in the vicinity.

The mechanical equipment rooms will be totally enclosed within the building. Equipment within these rooms will not affect noise levels on adjacent properties.

Truck Loading and Unloading

A loading zone and trash area at the south corner of the apartment building is identified in the site plans. This location would have existing ambient noise levels represented by LT-2 of the monitoring survey, which ranged from 52 to 59 dBA L_{eq} during daytime hours and had a measured day-night average noise level of 59 dBA DNL. Intermittent truck loading and unloading, as well as scheduled refuse collection associated with the project will be consistent with the existing similar activities in the vicinity and are not expected to generate noise levels exceeding the City's noise threshold at the nearby noise-sensitive land uses.

Mitigation Measure 1b: None required.

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

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

According to the National Register of Historic Places,[4] the nearest historical structure is located at 554 Mansion Park Drive, which is approximately 0.9 miles south of the project site. No other historical buildings are located in the vicinity of 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

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

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.

Table 12 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 12 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. Since no historical buildings are located within 60 feet of the site, the 0.08 in/sec PPV threshold would not be exceeded at any historical buildings during project construction and is not discussed further.

TABLE 12 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., November 2022.

Table 13 summarizes the possible vibration levels at nearest 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 13), which are different than the distances used to propagate construction noise levels (as shown in Tables 8 through 11), were estimated under the assumption that each piece of equipment from Table 12 was operating along the nearest boundary of the project site, which would represent the worst-case scenario.

Project construction activities would potentially generate vibration levels up to 0.145 in/sec PPV at the nearest apartment building adjoining the project site if construction activities occurred within 5 feet of the property line. A study completed by the US Bureau of Mines analyzed the effects of blast-induced vibration on buildings in USBM RI 8507.[5] The findings of this study have been applied to buildings affected by construction-generated vibrations.[6] 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 0.145 in/sec PPV would result in a l% chance or less of threshold or cosmetic damage at the nearest apartment building located southwest of the project site if heavy equipment were to be used along the southwest property line. No threshold or cosmetic damage, minor, or major damage would be expected at all other residential buildings in the project vicinity. At these locations, and in other surrounding areas where vibration would not be expected to cause cosmetic damage, vibration levels may still be perceptible. However, as with any type of construction, this would be anticipated and would not be considered significant, given the intermittent and short duration of the phases that have the highest potential of producing vibration (use of jackhammers and other high-power tools). By use of administrative controls, such as notifying neighbors of scheduled construction activities and scheduling construction activities with the highest potential to produce perceptible vibration during hours with the least potential to affect nearby businesses, perceptible vibration can be kept to a minimum.

In summary, the construction of the project would not generate vibration levels exceeding the General Plan threshold of 0.2 in/sec PPV at properties in the project vicinity. This would represent a less-than-significant impact.

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[5] 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.

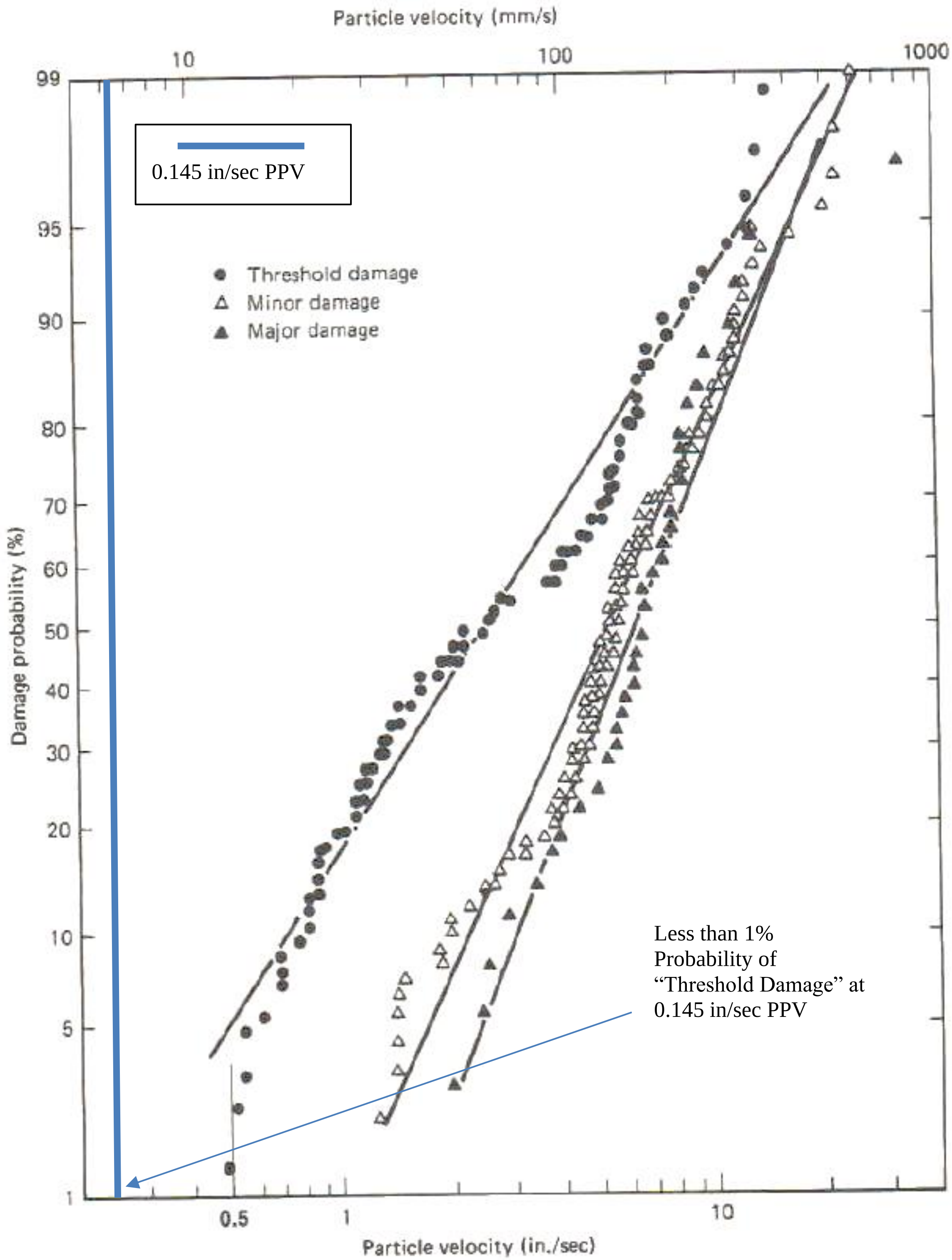
[6] Dowding, C.H., Construction Vibrations, Prentice Hall, Upper Saddle River, 1996.

TABLE 13 Vibration Source Levels for Construction Equipment

Equipment		PPV (in/sec)				
		Southwest Apartment Building (35ft)	**Southeast Apartment Building (55ft)**	**East Apartment Building (65ft)**	**West Apartment Building (80ft)**	**North School (160ft)**
Clam shovel drop		0.140	0.085	0.071	0.056	0.026
Hydromill (slurry wall)	In soil	0.006	0.003	0.003	0.002	0.001
	In rock	0.012	0.007	0.006	0.005	0.002
Vibratory Roller		0.145	0.088	0.073	0.058	0.027
Hoe Ram		0.061	0.037	0.031	0.025	0.012
Large bulldozer		0.061	0.037	0.031	0.025	0.012
Caisson drilling		0.061	0.037	0.031	0.025	0.012
Loaded trucks		0.052	0.032	0.027	0.021	0.010
Jackhammer		0.024	0.015	0.012	0.010	0.005
Small bulldozer		0.002	0.001	0.001	0.001	0.000

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., December 2022.

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: **None Required.**

Impact 3: **Excessive Aircraft Noise.** The project site is located approximately 2.5 miles north of Norman Y. Mineta San José International Airport, and the noise environment attributable to aircraft is considered normally acceptable under the Santa Clara County ALUC noise compatibility policies for residential land uses. This is a **less-than-significant** impact.

Norman Y. Mineta San José International Airport is a public-use airport located approximately 2.5 miles north of the project site. According to the City's Airport Master Plan Environmental Impact Report,[7] the project site lies well 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. Therefore, the proposed project would be compatible with the City's exterior noise standards for aircraft noise.

Assuming standard construction materials for aircraft noise below 60 dBA DNL, the future interior noise levels resulting from aircraft would below 45 dBA DNL. 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.**

[7] 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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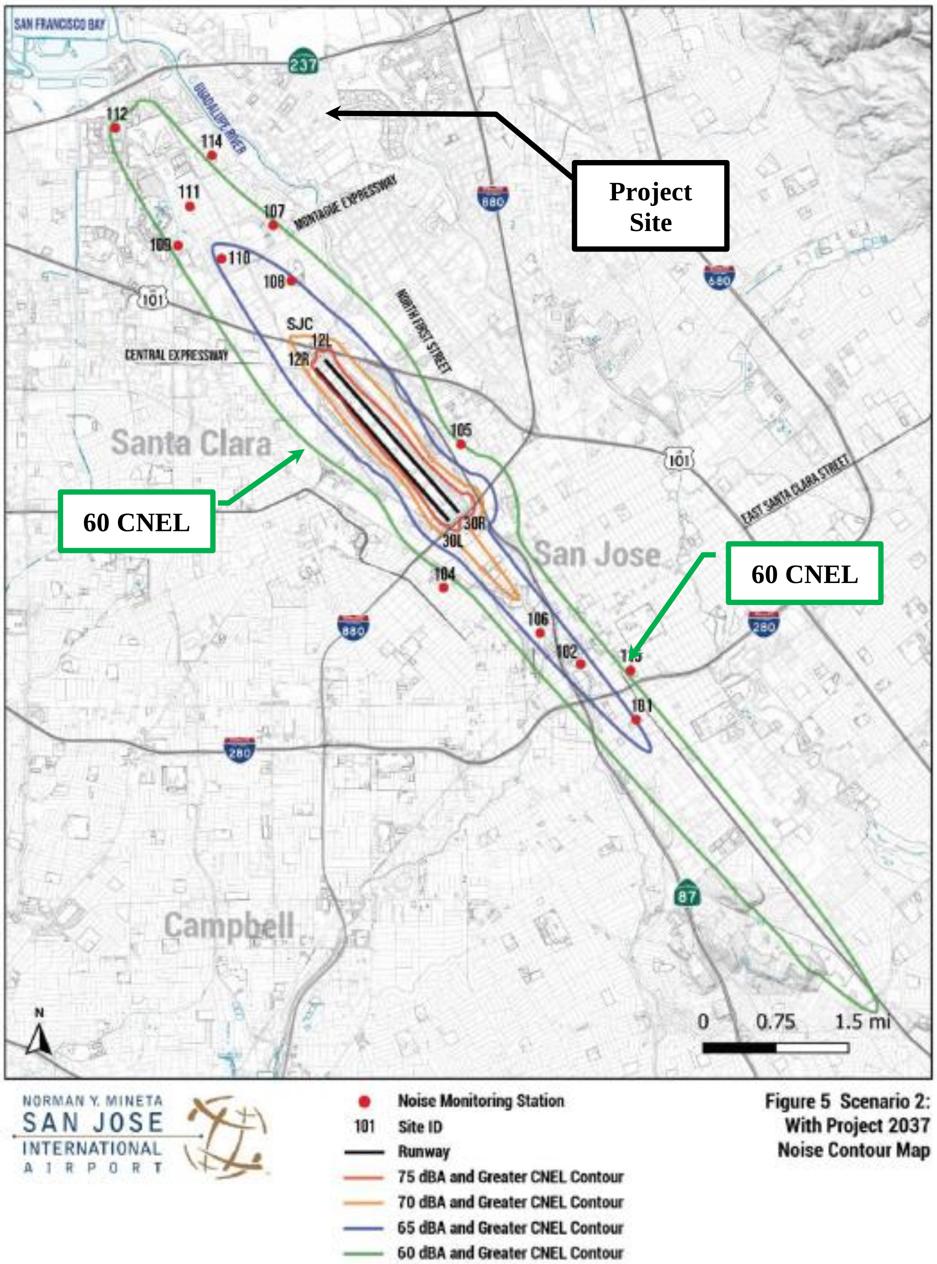


Source: BridgeNet International 2019

APPENDIX A – LONG-TERM NOISE DATA

FIGURE A1

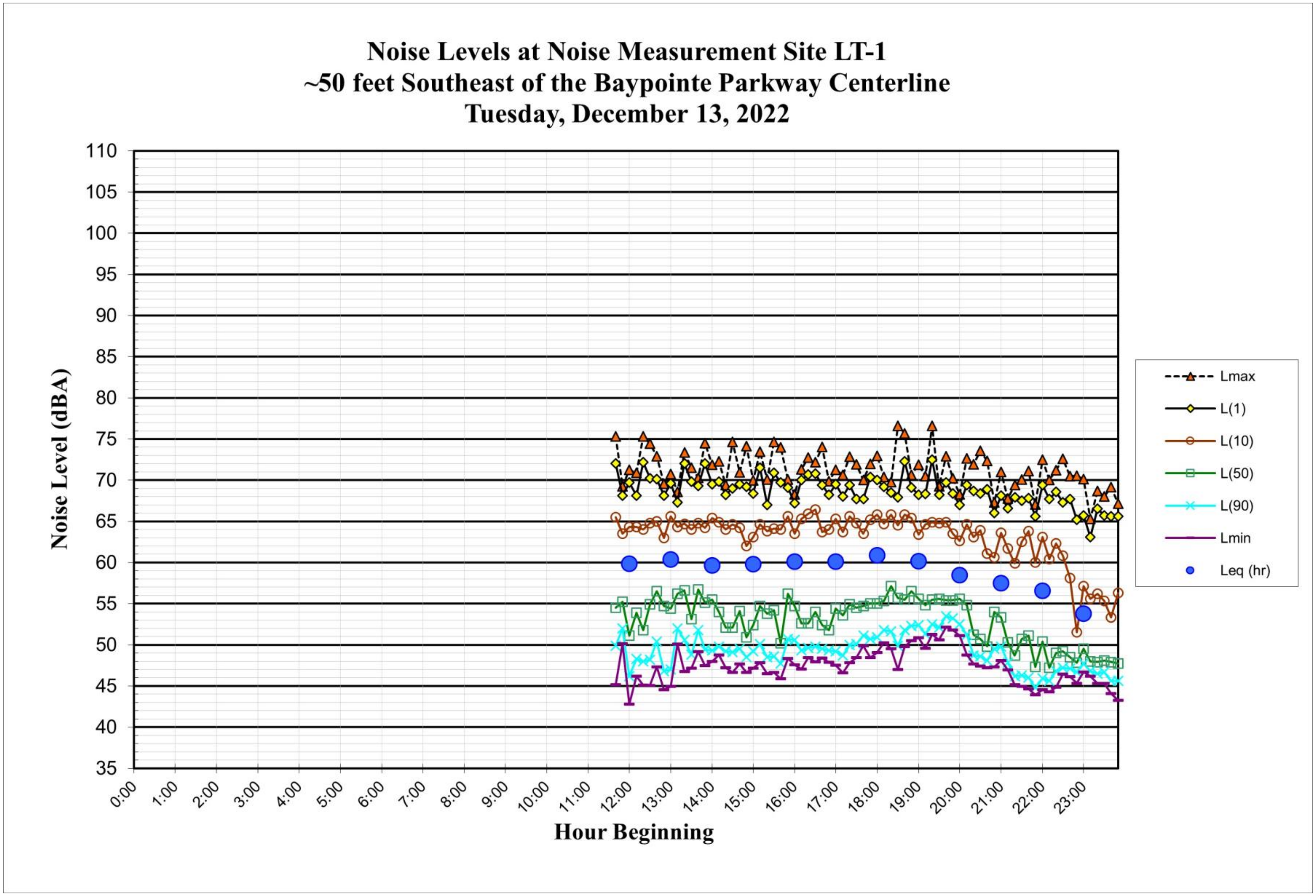

Noise Levels at Noise Measurement Site LT-1
~50 feet Southeast of the Baypointe Parkway Centerline
Tuesday, December 13, 2022
Noise Level (dBA)
110
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)

FIGURE A2

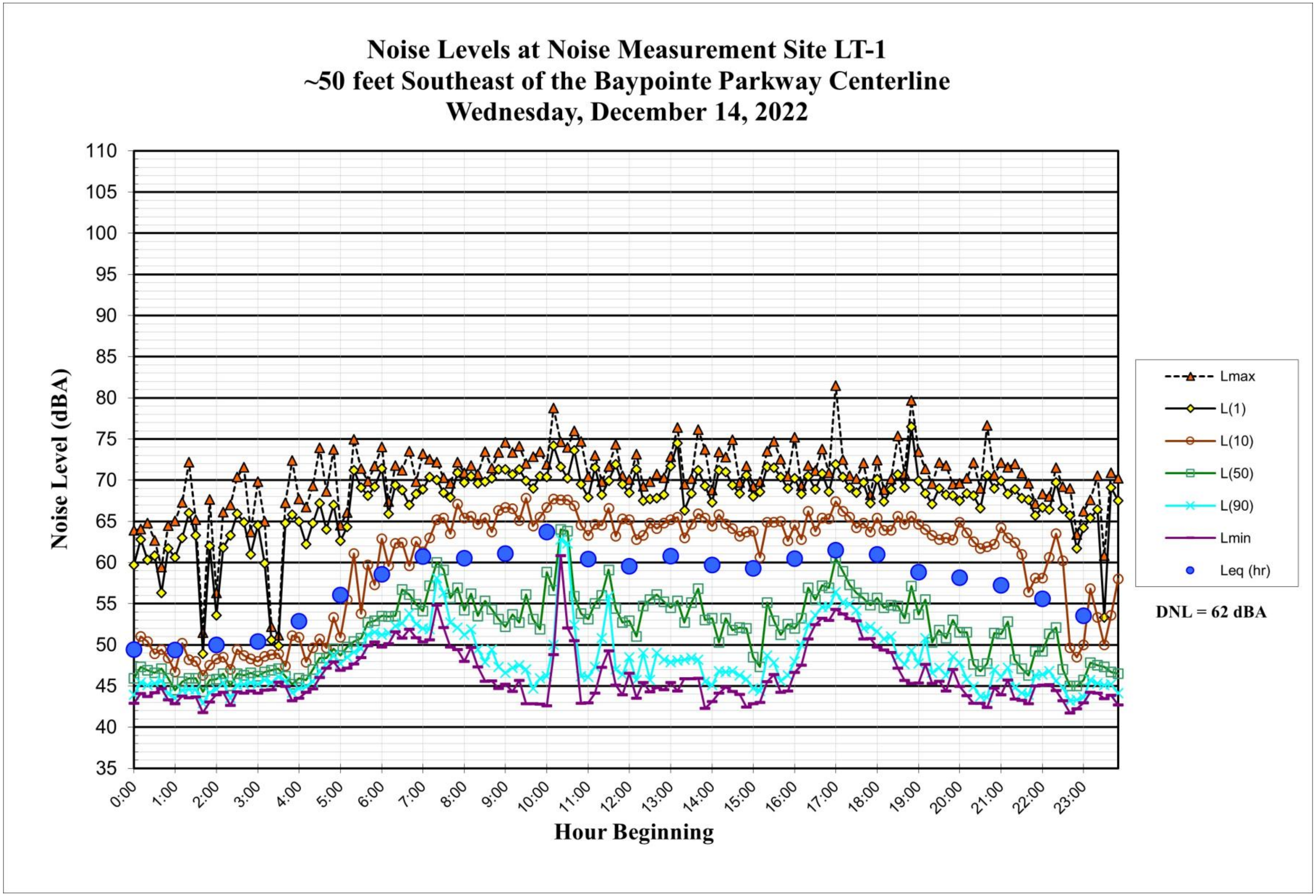
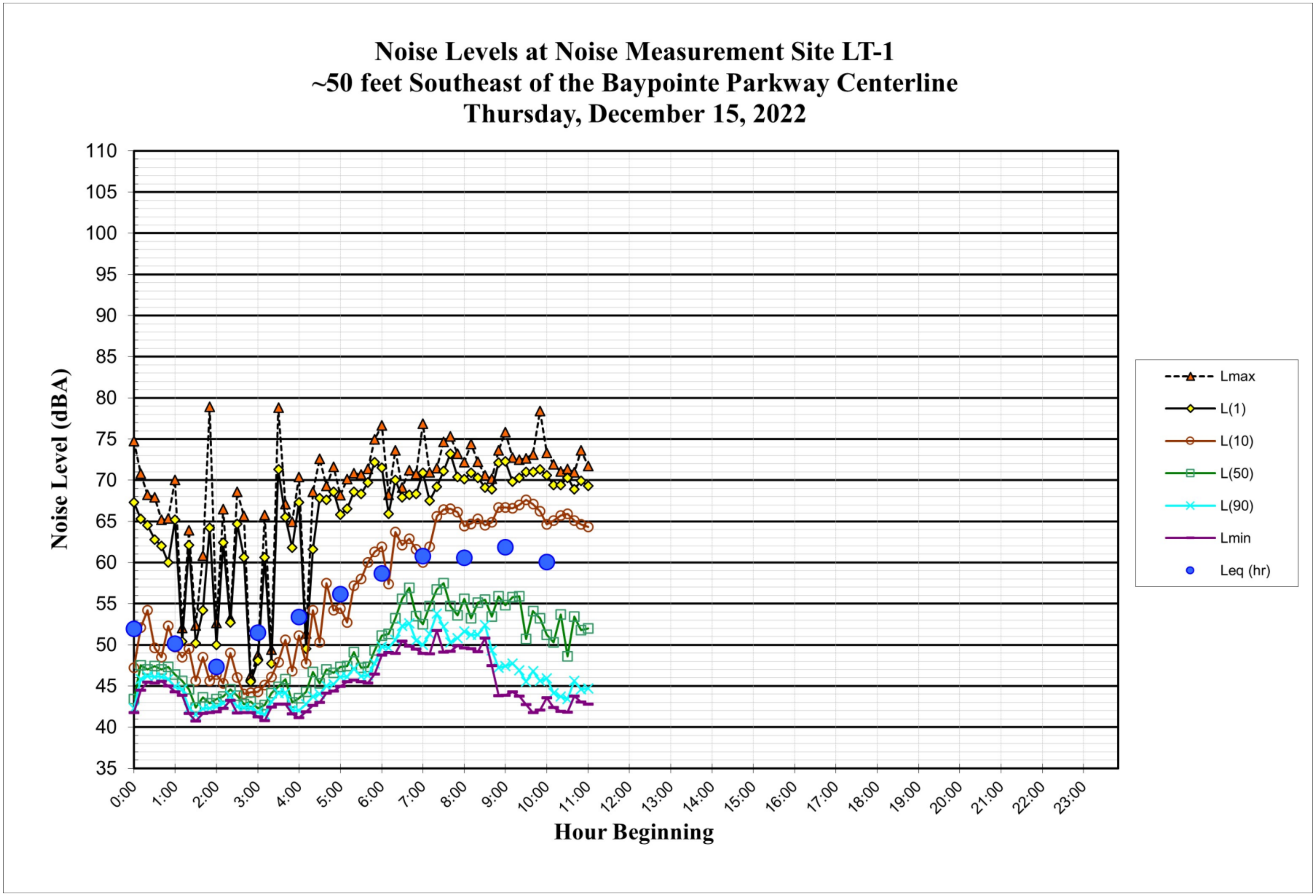

Noise Levels at Noise Measurement Site LT-1
~50 feet Southeast of the Baypointe Parkway Centerline
Wednesday, December 14, 2022
Noise Level (dBA)
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)
DNL = 62 dBA

FIGURE A3



Noise Levels at Noise Measurement Site LT-1
~50 feet Southeast of the Baypointe Parkway Centerline
Thursday, December 15, 2022
Noise Level (dBA)
110
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)

FIGURE A4

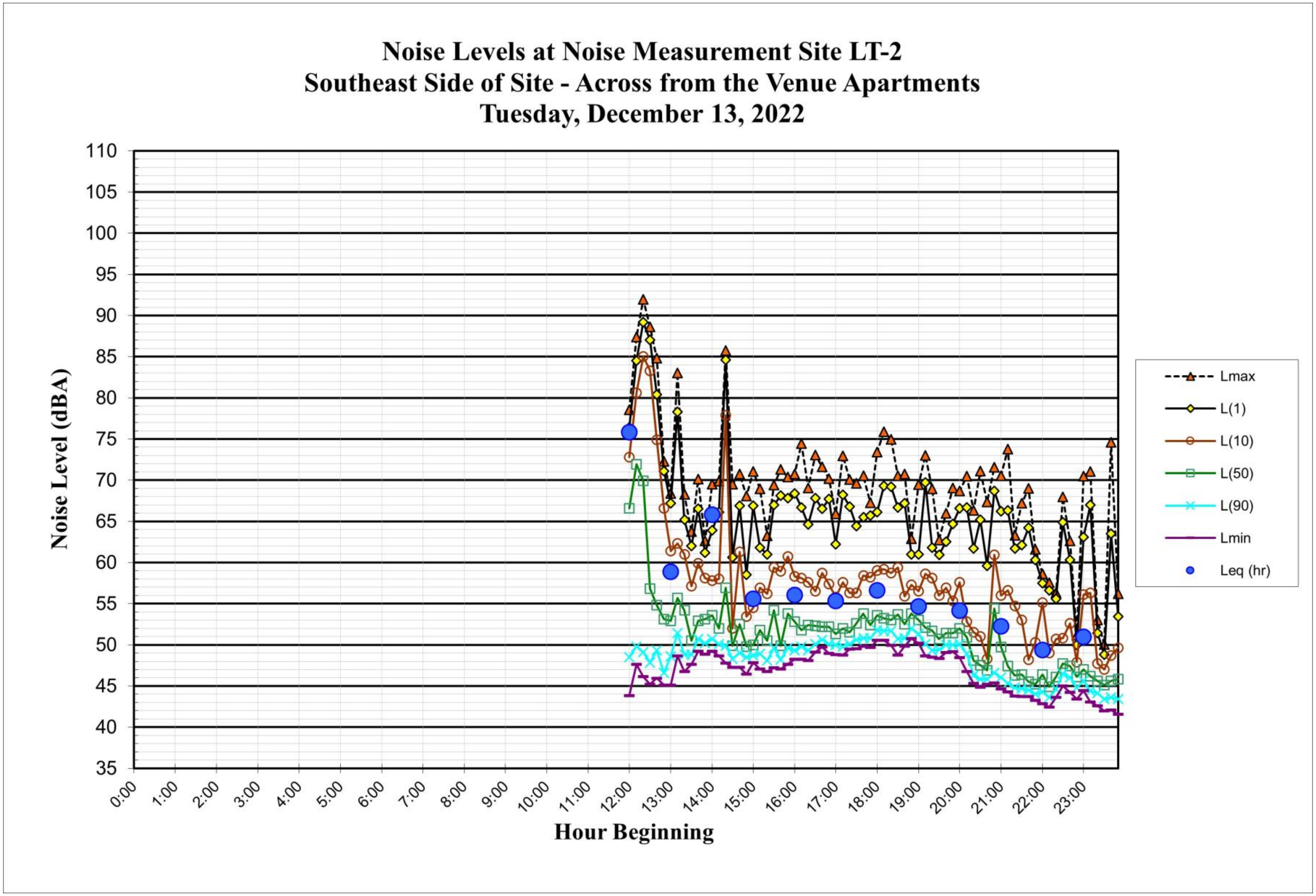

Noise Levels at Noise Measurement Site LT-2
Southeast Side of Site - Across from the Venue Apartments
Tuesday, December 13, 2022
Noise Level (dBA)
110
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)

FIGURE A5

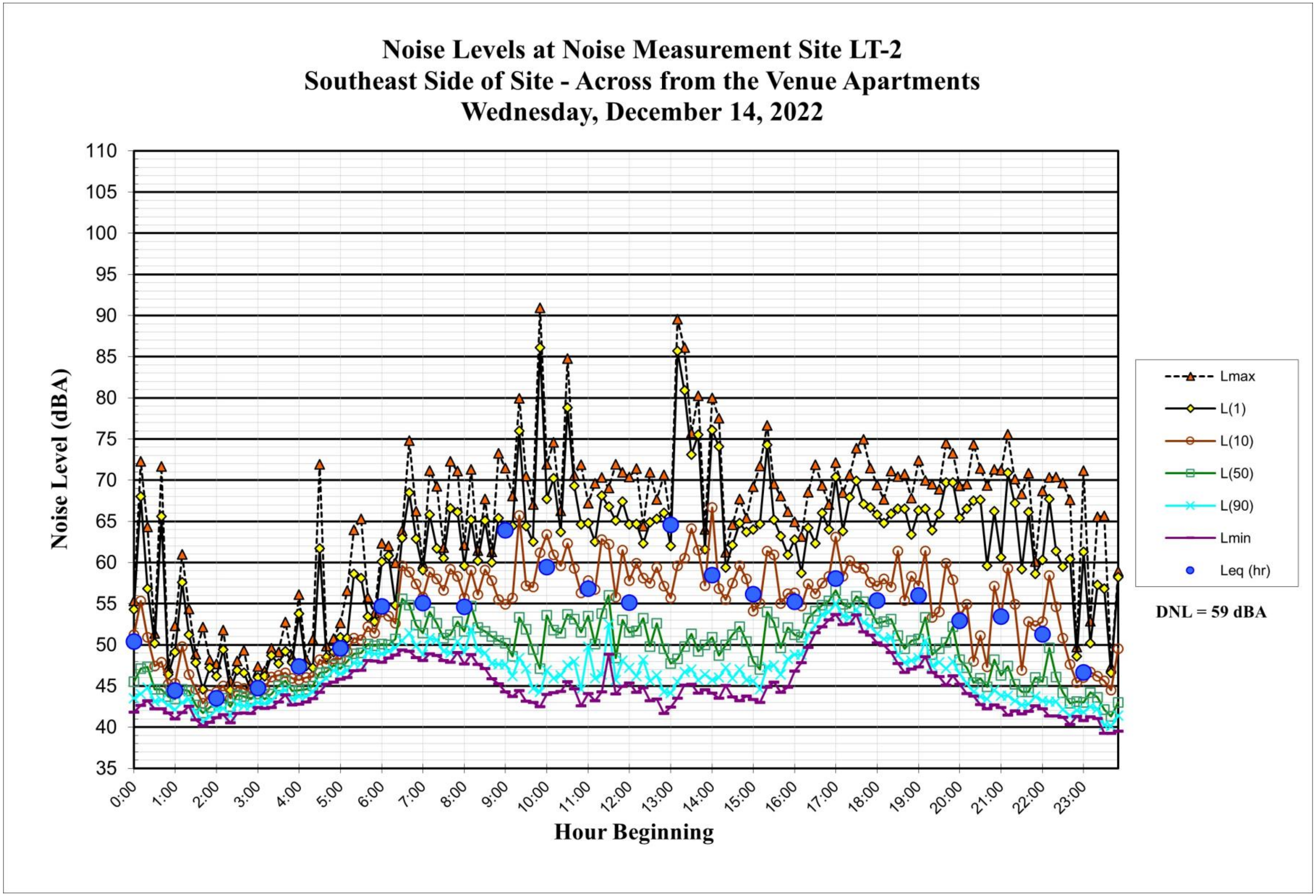
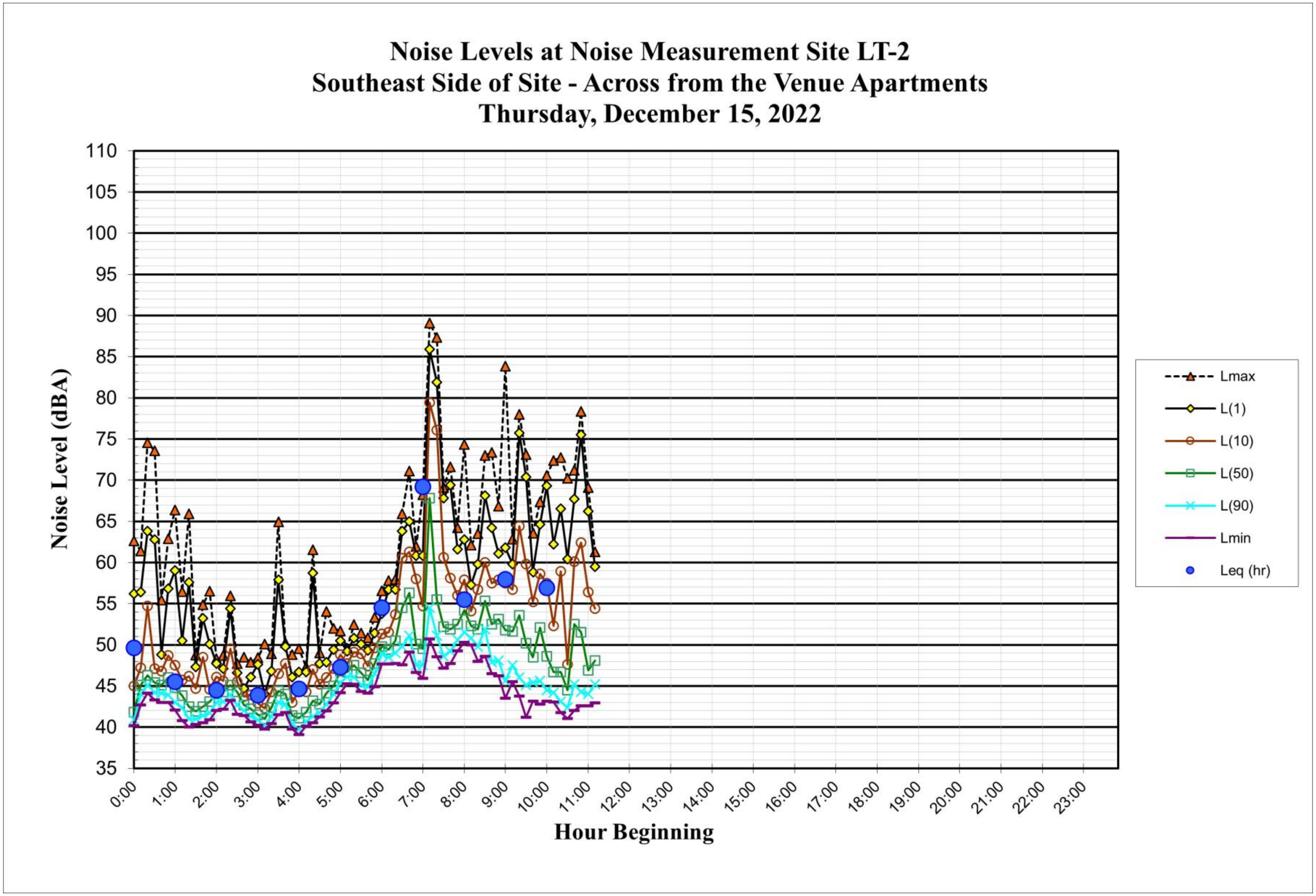

Noise Levels at Noise Measurement Site LT-2
Southeast Side of Site - Across from the Venue Apartments
Wednesday, December 14, 2022
Noise Level (dBA)
110
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)
DNL = 59 dBA

FIGURE A6



Noise Levels at Noise Measurement Site LT-2
Southeast Side of Site - Across from the Venue Apartments
Thursday, December 15, 2022
Noise Level (dBA)
110
105
100
95
90
85
80
75
70
65
60
55
50
45
40
35
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
Hour Beginning
Lmax
L(1)
L(10)
L(50)
L(90)
Lmin
Leq (hr)