Appendix F:

Noise Supporting Information

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FCS
An ADEC Innovation

Montague Point Industrial Project

Final Noise Impact Analysis Report

City of San José, California

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ACRONYMS AND ABBREVIATIONS

ADT	Average Daily Traffic
Caltrans	California Department of Transportation
CBC	California Building Standards Code
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dB	decibel
dBA	A-weighted decibel
dBA/DD	dBA per each doubling of distance
DNL	Day-Night Level
EPA	United States Environmental Protection Agency
FCS	FirstCarbon Solutions
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
in/sec	inches per second
L_{dn}	day/night average sound level
L_{eq}	equivalent continuous sound level
L_{max}	maximum noise/sound level
L_{min}	minimum noise/sound level
OSHA	Occupational Safety and Health Administration
PPV	peak particle velocity
rms	root mean square
VdB	vibration in decibels

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1 - INTRODUCTION

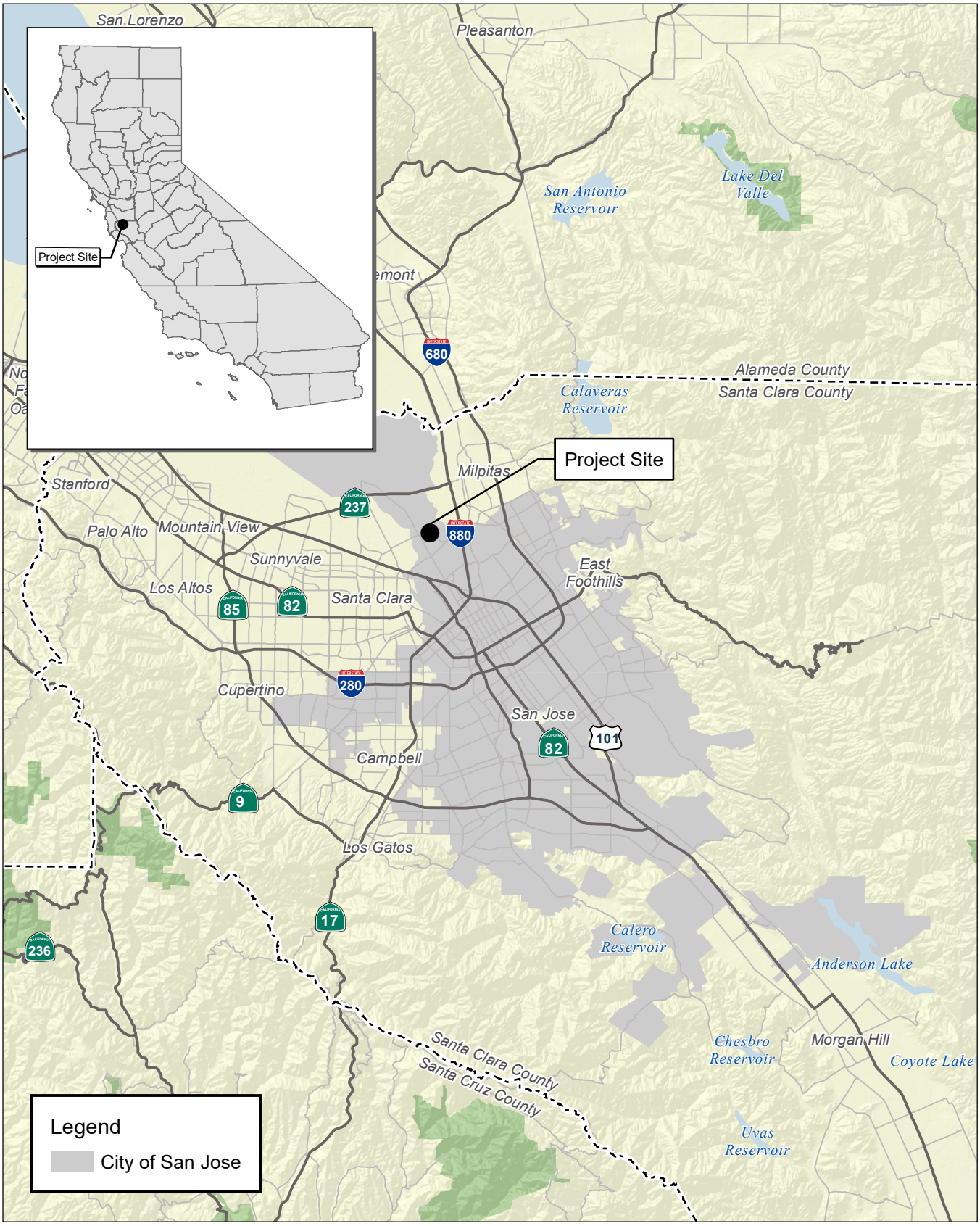
1.1 - Project Summary

McManagement Services, Inc (project applicant) proposes the demolition of five buildings with a total building square footage of approximately 422,635 square feet and the construction of three new buildings spanning approximately 437,501 square feet, including 359,501 square feet of warehouse area and 78,000 square feet of office space on a 23.75-acre project site (proposed project). The proposed buildings would cover approximately 39 percent of the project site. Each of the proposed buildings would include 11 loading docks and two grade-level doors. The proposed buildings would consist of concrete tilt-up panels consisting of glass windows and skylights and would have a maximum height of approximately 47 feet high at the top of the parapet. In addition to the new buildings, the proposed project would result in the construction of a new parking area and on-site landscaping, in addition to off-site improvements including the construction of Class II bicycle lanes along the proposed project frontage on Junction Avenue and Zanker Road.

1.1.1 - Site Location

The approximately 23.75-acre project site is located in the City of San José in Santa Clara County, California (Figure 1). Specifically, the project site is located across the addresses of 3050 Zanker Road, 2840-2880 Junction Avenue, and 411 East Plumeria Drive in the City of San José, California. The project site is bounded by Junction Avenue and existing commercial and industrial developments to the south; industrial development and apartments to the east; Montague Expressway, commercial and industrial development, and apartments to the north; and an electronics supplier and other forms of industrial development to the west (Figure 2). The project site consists of five parcels, identified as Assessor's Parcel Numbers (APNs) 101-31-001, 101-31-002, 101-31-003, 101-31-004, and 101-31-005 (Figure 3).

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Source: Census Data, The California Spatial Information Library (CaSIL). City of San Jose.

5 2.5 0 5 Miles

Figure 1
Regional Location Map

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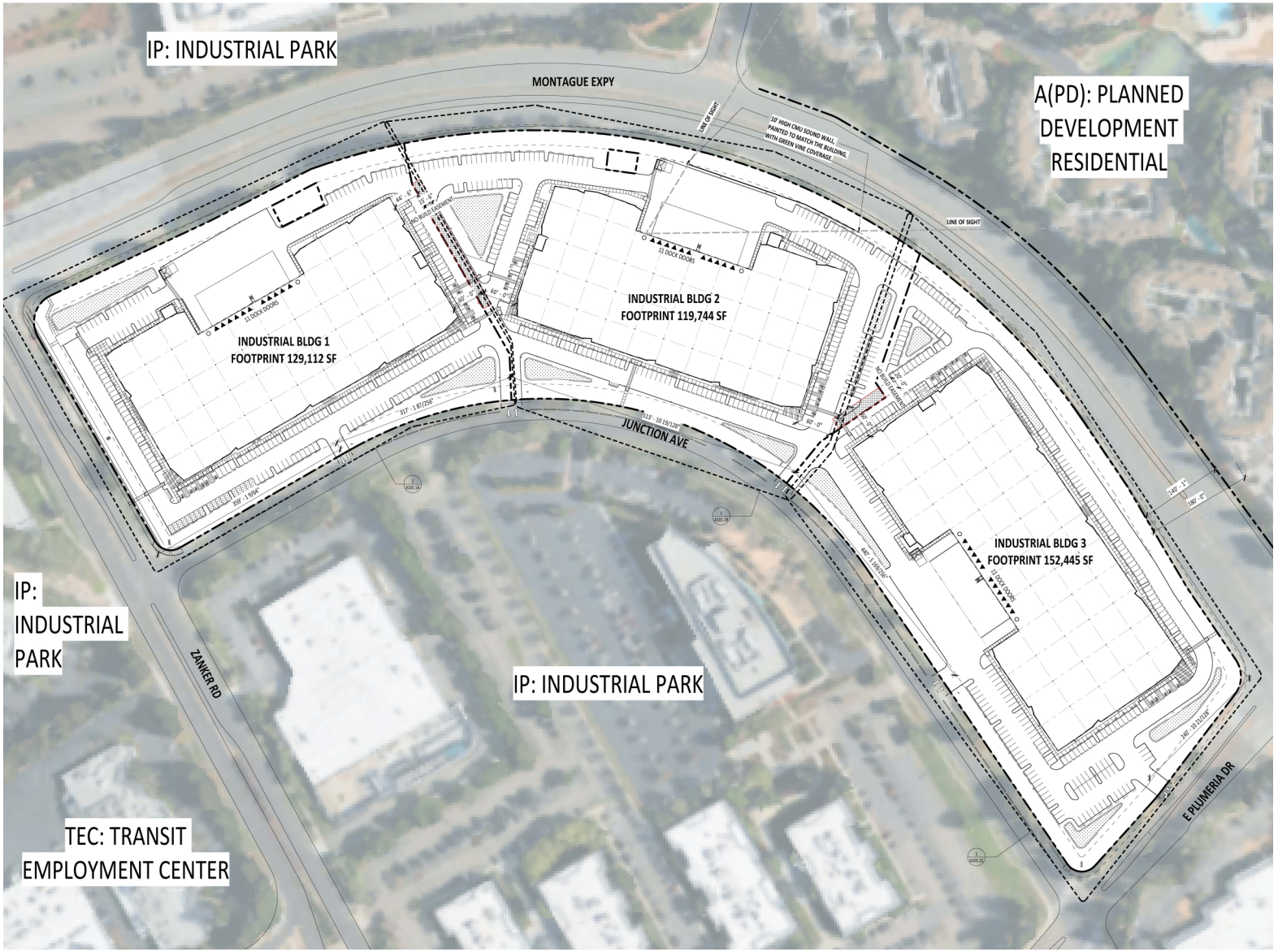


Source: ESRI World Imagery. Kier & Wright Civil Engineers and Surveyors, Inc., 08/22/2025.

1,000 500 0 1,000 Feet

Figure 2
Local Vicinity Map

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Source: Lowney Architecture, Kier & Wright Civil Engineers and Surveyors, Inc., HMH Engineers, 01/30/2026.

Figure 3
Overall Site Plan

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1.2 - Summary of Analysis Results

The following is a summary of the analysis results. Please refer to the Noise Impact Section, which provides comprehensive analyses in support of the findings and conclusions of significance.

NOISE				
Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
1. Generate 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?	☐	☐	☒	☐
2. Generate excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
3. 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, expose people residing or working in the project area to excessive noise levels?	☐	☒	☐	☒

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2 - NOISE AND VIBRATION FUNDAMENTALS

2.1 - Characteristics of Noise

Noise is generally defined as unwanted or objectionable sound. Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm, or when it has adverse effects on health. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance, and, in the extreme, hearing impairment. Noise effects can be caused by pitch or loudness. *Pitch* is the number of complete vibrations or cycles per second of a wave that result in the range of tone from high to low; higher-pitched sounds are louder to humans than lower-pitched sounds. *Loudness* is the intensity or amplitude of sound.

Sound is produced by the vibration of sound pressure waves in the air. Sound pressure levels are used to measure the intensity of sound and are described in terms of decibels. The decibel (dB) is a logarithmic unit, which expresses the ratio of the sound pressure level being measured to a standard reference level. The 0 point on the dB scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Changes of 3 dB or less are only perceptible in laboratory environments. Audible increases in noise levels generally refer to a change of 3 dB or more, as this level has been found to be barely perceptible to the human ear in outdoor environments. Only audible changes in existing ambient or background noise levels are considered potentially significant.

The human ear is not equally sensitive to all frequencies within the audible sound spectrum, so sound pressure level measurements can be weighted to better represent frequency-based sensitivity of average healthy human hearing. One such specific “filtering” of sound is called “A-weighting.” A-weighted decibels (dBA) approximate the subjective response of the human ear to a broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies that are audible to the human ear. Because decibels are logarithmic units, they cannot be added or subtracted by ordinary arithmetic means. For example, if one noise source produces a noise level of 70 dB, the addition of another noise source with the same noise level would not produce 140 dB; rather, they would combine to produce a noise level of 73 dB.

As noise spreads from a source, it loses energy so that the farther away the noise receiver is from the noise source, the lower the perceived noise level. Noise levels diminish or attenuate as distance from the source increases based on an inverse square rule, depending on how the noise source is physically configured. Noise levels from a single-point source, such as a single piece of construction equipment at ground level, attenuate at a rate of 6 dB for each doubling of distance (dBA/DD) between the single-point source of noise and the noise-sensitive receptor of concern. Heavily traveled roads with few gaps in traffic behave as continuous line sources and attenuate roughly at a rate of 3 dBA/DD.

2.1.1 - Noise Descriptors

There are many ways to rate noise for various time periods, but an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. Equivalent continuous sound level (L_{eq}) is the total sound energy of time-varying noise over a sample period. However, the predominant rating scales for human communities in the State of California are the L_{eq} and Community Noise Equivalent Level (CNEL) or the day-night average level (L_{dn}) based on dBA. CNEL is the time-varying noise over a 24-hour period, with a 5 dBA weighting factor applied to the hourly L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours) and a 10 dBA weighting factor applied to noise occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale but without the adjustment for events occurring during the evening hours. CNEL and L_{dn} are within 1 dBA of each other and are normally exchangeable. The noise adjustments are added to the noise events occurring during the more sensitive hours.

Other noise rating scales of importance when assessing the annoyance factor include the maximum noise level (L_{max}), which is the highest exponential time-averaged sound level that occurs during a stated time period. The noise environments discussed in this analysis are specified in terms of maximum levels denoted by L_{max} for short-term noise impacts. L_{max} reflects peak operating conditions and addresses the annoying aspects of intermittent noise.

2.1.2 - Noise Propagation

From the noise source to the receiver, noise changes both in level and frequency spectrum. The most obvious is the decrease in noise as the distance from the source increases. The manner in which noise reduces with distance depends on whether the source is a point or line source, as well as ground absorption, atmospheric conditions (wind, temperature gradients, and humidity) and refraction, and shielding by natural and manmade features. Sound from point sources, such as an air conditioning condenser, a piece of construction equipment, or an idling truck, radiates uniformly outward as it travels away from the source in a spherical pattern.

The attenuation, or sound drop-off, rate is dependent on the conditions of the land between the noise source and receiver. To account for this ground-effect attenuation (absorption), two types of site conditions are commonly used in noise models: soft-site and hard-site conditions. Soft-site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. For point sources, a drop-off rate of 7.5 dBA/DD is typically observed over soft ground with landscaping, as compared with a 6 dBA/DD drop-off rate over hard ground such as asphalt, concrete, stone, and very hard packed earth. For line sources, such as traffic noise on a roadway, a 4.5 dBA/DD is typically observed for soft-site conditions compared to the 3 dBA/DD drop-off rate for hard-site conditions. Table 1 briefly defines these measurement descriptors and other sound terminology used in this section.

Table 1: Sound Terminology

Term	Definition
Sound	A vibratory disturbance created by a vibrating object which, when transmitted by pressure waves through a medium such as air, can be detected by a receiving mechanism such as the human ear or a microphone.
Noise	Sound that is loud, unpleasant, unexpected, or otherwise undesirable.
Ambient Noise	The composite of noise from all sources near and far in a given environment.
Decibel (dB)	A unitless measure of sound on a logarithmic scale, which represents the squared ratio of sound pressure amplitude to a reference sound pressure. The reference pressure is 20 micropascals, representing the threshold of human hearing (0 dB).
A-Weighted Decibel (dBA)	An overall frequency-weighted sound level that approximates the frequency response of the human ear.
Equivalent Noise Level (L_{eq})	The average sound energy occurring over a specified time period. In effect, L_{eq} is the steady-state sound level that in a stated period would contain the same acoustical energy as the time-varying sound that actually occurs during the same period.
Maximum and Minimum Noise Levels (L_{max} and L_{min})	The maximum or minimum instantaneous sound level measured during a measurement period.
Day-Night Level (DNL or L_{dn})	The energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels occurring between 10:00 p.m. and 7:00 a.m. (nighttime).
Community Noise Equivalent Level (CNEL)	The energy average of the A-weighted sound levels occurring during a 24-hour period, with 5 dB added to the A-weighted sound levels occurring between 7:00 p.m. and 10:00 p.m. and 10 dB added to the A-weighted sound levels occurring between 10:00 p.m. and 7:00 a.m. (nighttime).

Source: Data compiled by FirstCarbon Solutions (FCS). 2025.

2.1.3 - Traffic Noise

The level of traffic noise depends on three primary factors: (1) the volume of the traffic, (2) the speed of the traffic, and (3) the number of trucks in the flow of traffic. Generally, the loudness of traffic noise is increased by heavier traffic volumes, higher speeds, and greater number of trucks. Vehicle noise is a combination of the noise produced by the engine, exhaust, and tires. Because of the logarithmic nature of noise levels, a doubling of the traffic volume (assuming that the speed and truck mix do not change) results in a noise level increase of 3 dBA. Based on the Federal Highway Administration (FHWA) community noise assessment criteria, this change is “barely perceptible.” For reference, a doubling of perceived noise levels would require an increase of approximately 10 dBA. The truck mix on a given roadway also has an effect on community noise levels. As the number of heavy trucks increases and becomes a larger percentage of the vehicle mix, adjacent noise levels increase.

2.1.4 - Stationary Noise

A stationary noise producer is any entity in a fixed location that emits noise. Examples of stationary noise sources include machinery, engines, energy production, and other mechanical or powered equipment and activities such as loading and unloading or public assembly that may occur at commercial, industrial, manufacturing, or institutional facilities. Furthermore, while noise generated by the use of motor vehicles over public roads is preempted from local regulation, the use of these vehicles is considered a stationary noise source when operated on private property such as at a construction site, a truck terminal, or warehousing facility.

The effects of stationary noise depend on factors such as characteristics of the equipment and operations, distance and pathway between the generator and receptor, and weather. Stationary noise sources may be regulated at the point of manufacture (e.g., equipment or engines), with limitations on the hours of operation, or with provision of intervening structures, barriers, or topography.

Construction activities are a common source of stationary noise. Construction-period noise levels are higher than background ambient noise levels but eventually cease once construction is complete. Construction is performed in discrete steps, each of which has its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise generated on each construction site and, therefore, would change the noise levels as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase. Table 2 shows typical noise levels of construction equipment as measured at a distance of 50 feet from the operating equipment.

Table 2: Typical Construction Equipment Maximum Noise Levels, L_{max}

Type of Equipment	Impact Device? (Yes/No)	Specification Maximum Sound Levels for Analysis (dBA at 50 feet)
Impact Pile Driver	Yes	95
Auger Drill Rig	No	85
Vibratory Pile Driver	No	95
Jackhammers	Yes	85
Pneumatic Tools	No	85
Pumps	No	77
Scrapers	No	85
Cranes	No	85
Portable Generators	No	82
Rollers	No	85
Bulldozers	No	85
Tractors	No	84
Front-end Loaders	No	80
Backhoe	No	80
Excavators	No	85
Graders	No	85
Air Compressors	No	80
Dump Truck	No	84
Concrete Mixer Truck	No	85
Pickup Truck	No	55

Notes:
dBA = A-weighted decibel
Source: Federal Highway Administration (FHWA). 2006. Highway Construction Noise Handbook. August.

2.1.5 - Noise from Multiple Sources

Because sound pressure levels in decibels are based on a logarithmic scale, they cannot be added or subtracted in the usual arithmetical way. Therefore, sound pressure levels in decibels are logarithmically added on an energy summation basis. In other words, adding a new noise source to an existing noise source, both producing noise at the same level, will not double the noise level. Instead, if the difference between two noise sources is 10 dBA or more, the louder noise source will

dominate, and the resultant noise level will be equal to the noise level of the louder source. In general, if the difference between two noise sources is 0–1 dBA, the resultant noise level will be 3 dBA higher than the louder noise source, or both sources if they are equal. If the difference between two noise sources is 2–3 dBA, the resultant noise level will be 2 dBA above the louder noise source. If the difference between two noise sources is 4–10 dBA, the resultant noise level will be 1 dBA higher than the louder noise source.

2.2 - Characteristics of Groundborne Vibration and Noise

Groundborne vibration consists of rapidly fluctuating motion through a solid medium, specifically the ground, that has an average motion of zero and in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. The effects of groundborne vibration typically only causes a nuisance to people, but in extreme cases, excessive groundborne vibration has the potential to cause structural damage to buildings. Although groundborne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. Groundborne noise is an effect of groundborne vibration and only exists indoors, since it is produced from noise radiated from the motion of the walls and floors of a room and may also consist of the rattling of windows or dishes on shelves.

Several different methods are used to quantify vibration amplitude, such as the maximum instantaneous peak in the vibration's velocity, which is known as the peak particle velocity (PPV) or the root mean square (rms) amplitude of the vibration velocity. Because of the typically small amplitudes of vibrations, vibration velocity is often expressed in decibels—denoted as LV—and is based on the reference quantity of 1 microinch per second. To distinguish these vibration levels referenced in decibels from noise levels referenced in decibels, the unit is written as "VdB."

Although groundborne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. When assessing annoyance from groundborne vibration, vibration is typically expressed as rms velocity in units of decibels of 1 microinch per second, with the unit written in VdB. Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. Human perception to vibration starts at levels as low as 67 VdB. Annoyance due to vibration in residential settings starts at approximately 70 VdB.

Off-site sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible groundborne noise or vibration. Construction activities, such as blasting, pile driving and operating heavy earthmoving equipment, are common sources of groundborne vibration. Construction vibration impacts on building structures are generally assessed in terms of PPV. Typical vibration source levels from construction equipment are shown in Table 3.

Table 3: Vibration Levels of Construction Equipment

Construction Equipment	PPV at 25 Feet (inches/second)	rms VdB at 25 Feet
Water Trucks	0.001	57
Scraper	0.002	58
Bulldozer—Small	0.003	58
Jackhammer	0.035	79
Concrete Mixer	0.046	81
Concrete Pump	0.046	81
Paver	0.046	81
Pickup Truck	0.046	81
Auger Drill Rig	0.051	82
Backhoe	0.051	82
Crane (Mobile)	0.051	82
Excavator	0.051	82
Grader	0.051	82
Loader	0.051	82
Loaded Trucks	0.076	86
Bulldozer—Large	0.089	87
Caisson drilling	0.089	87
Vibratory Roller—Small	0.101	88
Compactor	0.138	90
Clam shovel drop	0.202	94
Vibratory Roller—Large	0.210	94
Pile Driver (impact-typical)	0.644	104
Pile Driver (impact-upper range)	1.518	112

Notes:
PPV = peak particle velocity
rms = root mean square
VdB = vibration in decibels
Source: Compilation of scientific and academic literature, generated by the Federal Transit Administration (FTA) and Federal Highway Administration (FHWA).

The propagation of groundborne vibration is not as simple to model as airborne noise. This is because noise in the air travels through a relatively uniform medium, while groundborne vibrations travel through the ground, which may contain significant geological differences. Factors that influence groundborne vibration include:

- **Vibration source:** Type of activity or equipment, such as impact or mobile, and depth of vibration source.
- **Vibration path:** Soil type, rock layers, soil layering, depth to water table, and frost depth.
- **Vibration receiver:** Foundation type, building construction, and acoustical absorption.

Among these factors that influence groundborne vibration, there are significant differences in the vibration characteristics when the source is underground compared to at the ground surface. In addition, soil conditions are known to have a strong influence on the levels of groundborne vibration. Among the most important factors are the stiffness and internal damping of the soil and the depth to bedrock. Vibration propagation is more efficient in stiff clay soils than in loose sandy soils, and shallow rock seems to concentrate the vibration energy close to the surface and can result in groundborne vibration problems at large distance from the source. Factors such as layering of the soil and depth to the water table can have significant effects on the propagation of groundborne vibration. Soft, loose, sandy soils tend to attenuate more vibration energy than hard, rocky materials. Vibration propagation through groundwater is more efficient than through sandy soils. There are three main types of vibration propagation: surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wave front, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wave front. However, unlike P-waves, the particle motion is transverse, or side-to-side and perpendicular to the direction of propagation.

As vibration waves propagate from a source, the vibration energy decreases in a logarithmic nature and the vibration levels typically decrease by 6 VdB per doubling of the distance from the vibration source. As stated above, this drop-off rate can vary greatly depending on the soil type, but it has been shown to be effective enough for screening purposes, in order to identify potential vibration impacts that may need to be studied through actual field tests. The vibration level (calculated below as PPV) at a distance from a point source can generally be calculated using the vibration reference equation:

$$PPV = PPV_{ref} * (25/D)^n \text{ (in/sec)}$$

Where:

PPV_{ref} = reference measurement at 25 feet from vibration source
D = distance from equipment to property line
n = vibration attenuation rate through ground

According to Section 7 of the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual, an “n” value of 1.5 is recommended to calculate vibration propagation through typical soil conditions.[1]

[1] Federal Transit Administration (FTA). 2018. Transit Noise and Vibration Impact Assessment Manual. September.

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3 - REGULATORY SETTING

3.1 - Federal Regulations

Currently, no federal noise standards regulate environmental noise associated with temporary construction activities or the long-term operations of development projects. As such, both temporary and long-term noise impacts resultant from the proposed project would be largely regulated or otherwise evaluated using State and local agency standards designed to protect public well-being and health.

3.1.1 - United States Environmental Protection Agency

In 1972, Congress enacted the Noise Control Act. This Act authorized the United States Environmental Protection Agency (EPA) to publish descriptive data on the effects of noise and establish levels of sound "requisite to protect the public welfare with an adequate margin of safety." These levels are separated into health (hearing loss levels) and welfare (annoyance levels) categories, as shown in Table 4. The EPA cautions that these identified levels are not standards because they do not take into account the cost or feasibility of the levels.

For protection against hearing loss, 96 percent of the population would be protected if sound levels were less than or equal to an $L_{eq}(24)$ of 70 dBA. The EPA activity and interference guidelines are designed to ensure reliable speech communication at about 5 feet distance in the outdoor environment. For outdoor and indoor environments, interference with activity and annoyance should not occur if levels are below 55 dBA and 45 dBA, respectively.

Table 4: Summary of EPA Recommended Noise Levels to Protect Public Welfare

Effect	Level	Area
Hearing loss	$L_{eq}(24)$ <70 dB	All areas
Outdoor activity interference and annoyance	L_{dn} <55 dB	Outdoors in residential areas, farms, other outdoor areas where people spend widely varying amounts of time, and other places in which quiet is a basis for use
	$L_{eq}(24)$ <55 dB	Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc.
Indoor activity interference and annoyance	L_{eq} <45 dB	Indoor residential areas
	$L_{eq}(24)$ <45 dB	Other indoor areas with human activities such as schools, etc.

Notes:
(24) signifies an L_{eq} duration of 24 hours.
dB = decibel
L_{dn} = day/night average sound level
L_{eq} = equivalent sound level
Source: United States Environmental Protection Agency (EPA). 1978. Protective Noise Levels, EPA 550/9-79-100.

3.1.2 - Federal Transit Administration

The FTA has established industry accepted standards for vibration impact criteria and impact assessment. These guidelines are published in its Transit Noise and Vibration Impact Assessment Manual.[2] The FTA guidelines include thresholds for construction vibration impacts for various structural categories as shown in Table 5.

Table 5: Federal Transit Administration Construction Vibration Impact Criteria

Building Category	PPV (in/sec)	Approximate VdB
I. Reinforced Concrete, Steel, or Timber (no plaster)	0.5	102
II. Engineered Concrete and Masonry (no plaster)	0.3	98
III. Nonengineered Timber and Masonry Buildings	0.2	94
IV. Buildings Extremely Susceptible to Vibration Damage	0.12	90

Notes:
VdB = velocity in decibels
PPV = peak particle velocity
in/sec = inches per second
Source: Federal Transit Administration (FTA). 2018. Transit Noise and Vibration Impact Assessment Manual. September.

The FTA has also established construction noise impact guidelines for detailed construction noise impact analyses. The construction noise impact criteria identify thresholds for various types of receiving land uses. For example, the daytime 8-hour average threshold for receiving residential land uses is 80 dBA $L_{eq(8\text{-}hr)}$ and the nighttime threshold is 70 dBA $L_{eq(8\text{-}hr))}$. The threshold for receiving commercial land uses is 85 dBA $L_{eq(8\text{-}hr)}$ for daytime and nighttime construction activity. The threshold for receiving industrial land uses is 90 dBA $L_{eq(8\text{-}hr)}$ for daytime and nighttime construction activity.

3.2 - State Regulations

3.2.1 - California General Plan Guidelines

Established in 1973, the California Department of Health Services Office of Noise Control was instrumental in developing regularity tools to control and abate noise for use by local agencies. One significant model is the Land Use Compatibility for Community Noise Environments Matrix, which allows the local jurisdiction to delineate compatibility of sensitive uses with various incremental levels of noise.[3]

[2] Federal Transit Administration (FTA). 2018. Transit Noise and Vibration Impact Assessment Manual. September.

[3] California Department of Health Services Office of Noise Control. 1976. Land Use Compatibility for Community Noise Environments Matrix.

Government Code Section 65302 mandates that the legislative body of each county and city in California adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise/land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable. The proposed project is also subject to review under CEQA Guidelines. Appendix G of the CEQA Guidelines provides impact thresholds for potential noise and vibration impacts.

3.2.2 - California Building Standards Code

The State of California has established noise insulation standards for new hotels, motels, apartment houses, and dwellings (other than single-family detached housing). These requirements are provided in the 2022 California Building Standards Code (CBC) (California Code of Regulations [CCR] Title 24). As provided in the CBC, the noise insulation standards set forth an interior standard of 45 dBA CNEL as measured from within the structure's interior. Title 24 standards are typically enforced by local jurisdictions through the building permit application process.

3.3 - Local Regulations

The project site is located in the City of San José. Noise is addressed in the Envision San José 2040 General Plan (General Plan)[4] and the San José Municipal Code (Municipal Code).[5]

3.3.1 - Envision San José 2040 General Plan

The General Plan includes goals, policies and actions for the purpose of avoiding or mitigating impacts resulting from planned development projects within the City. The following are the noise goals and policies established by the General Plan that are relevant to this analysis:

Goal EC-1 Community Noise Levels and Land Use Compatibility. Minimize the impact of noise on people through noise reduction and suppression techniques, and through appropriate land use policies.

Policy 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

[4] City of San José. 2018. Envision San José 2040 General Plan. October.

[5] City of San José. Municipal Code. November 13, 2025.

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 Standards 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.

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 in the General Plan).

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 the 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 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 for sources other than aircraft and elevated roadway segments.

Policy EC-1.2 Minimize the noise impacts of new development on land uses sensitive to increased noise levels 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 Day-Night Average Sound Level (Ldn) at noise-sensitive receptors to increase by five A-weighted decibel (dBA) Ldn or more where the noise levels would remain "Normally Acceptable"; or
- Cause the Ldn at noise-sensitive receptors to increase by three dBA Ldn or more where noise levels would equal or exceed the "Normally Acceptable" level.

Policy 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.

Policy 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.

Policy 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.

Policy EC-2.3 Require new development to minimize vibration impacts to adjacent uses during demolition and construction. For sensitive historic structures, a 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 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.

City of San José Municipal Code

The Municipal Code restricts construction hours within 500 feet of a residential unit to occur only between 7:00 a.m. to 7:00 p.m. Monday through Friday, unless otherwise expressly allowed in a Development Permit or other planning approval. No construction activities are permitted on the weekends at sites within 500 feet of a residence.

20.50.300 Performance standards.

For industrial zoning districts, this ordinance limits noise generated by any use or combination of uses to not exceed 55 dBA L_{max} at any residential property line and 60 dBA L_{max} at commercial property lines, unless otherwise expressly allowed in a Development Permit or other planning approval. This ordinance also prohibits activity on any site that causes ground vibration that is perceptible without instruments at the property line of the site.

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4 - EXISTING NOISE CONDITIONS

4.1 - Ambient Noise

The dominant noise sources in the project vicinity include traffic on local roadways, primarily from traffic on Montague Expressway, which runs along the northern boundary of the project site and parking lot noise.

An ambient noise monitoring effort was conducted to document daytime ambient noise levels on the project site. Short-term noise monitoring was conducted by FirstCarbon Solutions (FCS) on November 10, 2025, between 2:56 p.m. and 3:31 p.m. The noise measurements were taken during the midday hours, as the midday hours typically have the highest daytime noise levels in urban environments. It should be noted that peak noise hours often vary slightly from peak traffic hours, as peak noise hours more closely align with high volume traffic that is still free flowing, while peak traffic hours often result in slower vehicle speeds due to the volume of traffic on the roadway. The short-term existing noise measurement results are summarized in Table 6. The noise monitoring data sheets are included in Appendix A.

Table 6: Existing Ambient Noise Levels on the Project Site

Site ID #	Location Description (Primary Noise Sources)	dBA L_{eq}	dBA L_{50}	dBA L_{max}
ST-1	West Corner of the project site by the intersection of Montague Expressway and Zanker Road. (Traffic noise along Zanker Road and Montague Expressway).	63.6	60.8	75.5
ST-2	Southeast corner of the project site, along River Oaks Parkway. (Traffic noise along River Oaks Parkway).	60.3	59.1	68.0
ST-3	On-site along Montague Expressway across from the multi-family residences to the north. (Traffic noise along Montague Expressway, parking lot activity).	68.3	67.0	78.6

Notes:
dBA = A-weighted decibel
L_{eq} = equivalent sound level
L_{min} = minimum noise/sound level
L_{max} = maximum noise level
Source: FirstCarbon Solutions (FCS). 2025. (Appendix A)

4.2 - Traffic Noise

Traffic noise levels along Montague Expressway and Junction Avenue adjacent to the project site were modeled using the FHWA Traffic Noise Prediction Model (FHWA-RD-77-108). Site-specific

information is entered, such as roadway traffic volumes, roadway active width, source-to-receiver distances, travel speed, noise source and receiver heights, and the percentages of automobiles, medium trucks, and heavy trucks that the traffic is made up of throughout the day, among other variables. The peak-hour traffic volumes were obtained from the traffic analysis prepared for the proposed project by Hexagon Transportation Consultants.[6] The model inputs and outputs—including the 60 dBA, 65 dBA, and 70 dBA DNL noise contour distances—are provided in Appendix B of this document. Table 7 shows the traffic noise levels as measured at 50 feet from the centerline of the outermost travel lane.

Table 7: Existing Traffic Noise Levels

Roadway Segment	ADT	Centerline to 70 DNL (feet)[1]	Centerline to 65 DNL (feet)[1]	Centerline to 60 DNL (feet)[1]	DNL (dBA) 50 feet from Centerline of Outermost Lane
Montague Expressway–North 1st Street to Research Place	33,100	211	453	974	77.2
Montague Expressway–Research Place to River Oaks Parkway	31,600	205	439	945	77.0
Junction Avenue–Zanker Road to East Plumeria Drive	2,200	< 50	65	140	66.0

Notes:
ADT = Average Daily Traffic
DNL = Day-Night Level
dBA = A-weighted decibel
[1] As measured at 50 feet from the centerline of the outermost travel lane.
Source: FirstCarbon Solutions (FCS). 2025. (Appendix B)

[6] Hexagon Transportation Consultants, Inc. 2025. Transportation Impact Study for the Montague Point Industrial Project. December 23.

5 - THRESHOLDS OF SIGNIFICANCE AND IMPACT ANALYSIS

5.1 - Thresholds of Significance

According to the California Environmental Quality Act (CEQA) Guidelines Appendix G, to determine whether impacts related to noise and vibration are significant environmental effects, the following questions are analyzed and evaluated.

Would the proposed project:

a) Generate 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) Generate 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 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

5.2 - Substantial Noise Increase in Excess of Standards

5.2.1 - Construction Noise Impacts

For purposes of this analysis, a significant impact would occur if construction activities would result in a substantial temporary increase in ambient noise levels in excess of the City's established standards applicable to construction noise.

The Municipal Code noise ordinances limit the permissible hours for construction activity to between the hours of 7:00 a.m. and 7:00 p.m., Monday through Friday. No construction is permitted on Saturdays, Sundays, or federal holidays.

In addition, Municipal Code Policy EC-1.7 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.

While the City of San José does not establish noise level thresholds for construction activities, this analysis uses the noise limits established by the 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.[7] During daytime hours, an exterior threshold of 80 dBA $L_{eq(8\text{-}hour)}$ shall be enforced at residential land uses, 85 dBA $L_{eq(8\text{-}hour)}$ at commercial land uses and 90 dBA $L_{eq(8\text{-}hour)}$ at industrial land uses.

Construction-related Traffic Noise

Noise impacts from construction activities associated with the proposed project would be a function of the noise generated by construction equipment, equipment location, sensitivity of nearby land uses, and the timing and duration of the construction activities. One type of short-term noise impact that could occur during project construction would result from the increase in traffic flow on local streets, associated with the transport of workers, equipment, and materials to and from the project site. The transport of workers and construction equipment and materials to the project site would incrementally increase noise levels on access roads leading to the site. Because workers and construction equipment would use existing routes, noise from passing trucks would be similar to existing vehicle-generated noise on these local roadways. Typically, a doubling of the Average Daily Traffic (ADT) hourly volumes on a roadway segment is required in order to result in an increase of 3 dBA in traffic noise levels, which as discussed in the characteristics of noise discussion above, is the lowest change that can be perceptible to the human ear in outdoor environments. Noise impacts from construction activities associated with the proposed project would be a function of the noise generated by construction equipment, equipment location, sensitivity of nearby land uses, and the timing and duration of the construction activities. One type of short-term noise impacts that could occur during project construction would result from the increase in traffic flow on local streets associated with the transport of workers, equipment, and materials to and from the project site.

According to the traffic study prepared for the proposed project by Hexagon Transportation Consultants,[8] Junction Avenue, which is the roadway segment that would receive 100 percent of the project construction traffic volumes, experiences an average of 2,200 average daily trips. Based on the air quality modeling, the maximum average daily trips during any phase of construction would be 356, which would occur during the demolition phase of construction. Therefore, project-related construction trips would not double the daily traffic volumes along any roadway segments accessing the project site and, as a result, would cause a less than 3 dBA increase in traffic noise levels. For this reason, short-term intermittent noise from construction trips would not be expected to result in a perceptible increase in hourly- or daily-average traffic noise levels in the project vicinity. Therefore, short-term construction-related noise impacts associated with the transportation of workers and equipment to the project site would be **less than significant.**

Construction Equipment Operational Noise

The second type of short-term noise impact is related to noise generated during construction on the project site. Construction is completed in discrete steps, each of which has its own mix of equipment

[7] Federal Transit Administration (FTA). 2018. Transit Noise and Vibration Impact Assessment Manual. September.

[8] Hexagon Transportation Consultants. 2025. Transportation Impact Study for the Montague Point Industrial Project. December 23.

and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise generated on the site and, therefore, the noise levels surrounding the site as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase. Table 2 lists typical construction equipment noise levels, based on a distance of 50 feet between the equipment and a noise receptor. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full power operation followed by 3 or 4 minutes at lower power settings. Impact equipment such as pile drivers are not expected to be used during construction of the proposed project.

The loudest phase of construction is typically the site preparation and grading phase, as that is when the loudest pieces of heavy construction equipment would operate. For example, the maximum noise level generated by each scraper is assumed to be 85 dBA L_{max} at 50 feet from this equipment. Each bulldozer would also generate 85 dBA L_{max} at 50 feet. The maximum noise level generated by graders is approximately 85 dBA L_{max} at 50 feet.

A conservative but reasonable assumption is that heavy construction equipment would operate simultaneously and continuously over at least a 1-hour period in the vicinity of the closest existing residential receptors, but would move linearly over the project site as they perform their earthmoving operations, spending a relatively short amount of time adjacent to any one receptor.

The closest noise-sensitive receptors to the project site are the multi-family residential dwellings located north of the project site. The façade of this nearest sensitive receptor would be located approximately 205 feet from the nearest construction footprint where multiple pieces of heavy construction equipment could operate simultaneously during construction. At this distance, worst-case construction noise levels could have an hourly average of up to 66 dBA L_{eq} at the façade of the nearest multi-family residential building. When averaged over an 8-hour workday, as equipment operates across the project site, worst-case construction noise levels would average 62 dBA $L_{eq(8\text{-}hour)}$. This reasonable worst-case 8-hour average is below the FTA noise threshold criteria of 80 dBA $L_{eq(8\text{-}hour)}$ for receiving residential land uses, and the impact would be considered less than significant. The calculation spreadsheet with the detailed modeling assumptions is included in Appendix B.

It should also be noted that these noise levels would be temporary, only occurring during the site preparation phase when construction equipment operates adjacent to the project boundaries. The proposed project would also comply with the City's SPC NOI-1, provided below, including the restriction to limit such activity to daytime hours, further reducing construction noise impacts.

However, since the proposed construction would last for more than 12-months, in compliance with General Plan Policy EC 1.7, Mitigation Measure (MM) NOI-1 is required which 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. These measures must be in place prior to the start of construction and implemented during construction to reduce noise impacts on neighboring residents and other uses.

Therefore, project construction noise impacts would be less than significant with implementation of MM NOI-1.

MM NOI-1 Construction Noise Logistics Plan Mitigation Measure.

In compliance with General Plan Policy ES 1.7, since construction will last longer than 12 months and is seeking a variance to permit construction activity on Saturdays, the proposed project is required to implement the following construction noise measures. These measures are 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:

- Pile driving is prohibited.
- Construction hours shall be limited to the hours of 7:00 a.m. to 7:00 p.m. Monday through Friday for any on-site or off-site work within 500 feet of any residential unit. Any variance from these hours, such as the approval to work on Saturdays, must be approved by the City prior to issuance of building permits.
- Construct solid plywood fences around ground level construction sites adjacent to operational businesses, residences, or other noise-sensitive land uses.
- Equip all internal combustion engine-driven equipment with intake and exhaust mufflers that are in good condition and appropriate for the equipment.
- Prohibit unnecessary idling of internal combustion engines.
- Locate stationary noise generating equipment such as air compressors or portable power generators as far as possible from sensitive receptors. Construct temporary noise barriers to screen stationary noise generating equipment when located near adjoining sensitive land uses.
- Utilize “quiet” air compressors and other stationary noise sources where technology exists.
- Control noise from construction workers’ radios to a point where they are not audible at existing residences bordering the project site.
- Notify all adjacent business, residences, and other noise-sensitive land uses of the construction schedule, in writing, and provide a written schedule of “noisy” construction activities to the adjacent land uses and nearby residences.
- Designate a “disturbance coordinator” who shall be responsible for responding to any complaints about construction noise. The disturbance coordinator shall determine the cause of the noise complaint (e.g., bad muffler, etc.) and shall require that reasonable measures be implemented to correct the problem. Conspicuously post a telephone number for the disturbance coordinator at the construction site and include it in the notice sent to neighbors regarding the construction schedule.

5.2.2 - Mobile Source Operational Noise Impacts

A significant impact would occur if project-generated traffic would result in a substantial increase in ambient noise levels compared with those that would exist without the proposed project. The City considers a significant noise impact to occur if a project would cause the DNL at noise-sensitive receptors to increase by 5 dBA DNL or more where the noise levels would remain "normally acceptable" for adjacent land uses; or where it would cause the DNL at noise-sensitive receptors to increase by 3 dBA DNL or more where noise levels would equal or exceed the "normally acceptable" level for adjacent land uses.

Traffic noise levels along roadway segments adjacent to the project site were modeled using the FHWA Traffic Noise Prediction Model (FHWA-RD-77-108). Site-specific information is entered, such as roadway traffic volumes, roadway active width, source-to-receiver distances, travel speed, noise source and receiver heights, and the percentages of automobiles, medium trucks, and heavy trucks that the traffic is made up of throughout the day, among other variables. The peak-hour traffic volumes were obtained from the traffic analysis prepared for the proposed project by Hexagon Transportation Consultants.[9] The model inputs and outputs—including the 60 dBA, 65 dBA, and 70 dBA DNL noise contour distances—are provided in Appendix B of this document. Table 8 shows the traffic noise levels as measured at 50 feet from the centerline of the outermost travel lane.

Table 8: Traffic Noise Increase Summary

Roadway Segment	Background No Project (dBA) DNL[1]	Background Plus Project (dBA) DNL[1]	Increase Over Background (dBA)
Montague Expressway–North 1st Street to Research Place	77.3	77.3	0.0
Montague Expressway–Research Place to River Oaks Parkway	77.1	77.1	0.0
Junction Avenue–Zanker Road to East Plumeria Drive	66.0	66.5	0.5

Notes:
DNL = Day-Night Level
dBA = A-weighted decibel
[1] As measured at 50 feet from the centerline of the outermost travel lane.
Source: FirstCarbon Solutions (FCS). 2025.

As shown in Table 8, the highest traffic noise level increase with implementation of the proposed project would occur on Junction Avenue, which is the roadway segment that would receive 100 percent of the project traffic volumes. The resulting traffic noise increase would be 0.5 dBA compared to traffic noise levels that would exist without the proposed project. This increase is well below the City's thresholds of 5 dBA DNL for areas within the "normally acceptable" range and 3 dBA DNL for

[9] Hexagon Transportation Consultants, 2025. Transportation Impact Study for the Montague Point Industrial Project. December 23.

areas at or above the “normally acceptable” level. Therefore, the proposed project would not result in a substantial increase in ambient noise levels, and the impact would be **less than significant.**

5.2.3 - Stationary Source Operational Noise Impacts

A significant impact would occur if operational noise levels generated by stationary noise sources at the proposed project site would result in a substantial permanent increase in ambient noise levels in excess of standards established in the local general plan or noise ordinance or applicable standards of other agencies.

According to General Plan Policy EC-1.2, a significant noise impact would occur if a project would:

- Cause the Day-Night Level (L_{dn}) at noise-sensitive receptors to increase by 5 dBA L_{dn} or more where noise levels would remain “Normally Acceptable”; or
- Cause the L_{dn} at noise-sensitive receptors to increase by 3 dBA L_{dn} or more where noise levels would equal or exceed the “Normally Acceptable” level.

According to General Plan Policy EC-1.3, new nonresidential land uses’ operational noise would result in a significant noise impact if a project would exceed 55 dBA DNL at the adjoining property lines when located adjacent to existing or planned noise-sensitive residential and public/quasi-public land uses.

According to the Zoning Ordinance (Section 20.50.300, Performance Standards) for industrial zoning districts, noise generated by any on-site stationary use or combination of uses would result in a significant impact if it would exceed 55 dBA L_{max} at any residential property line and 60 dBA L_{max} at commercial property lines, unless otherwise expressly allowed in a Development Permit or other planning approval.

The primary new stationary noise sources associated with implementation of the proposed project would be the new mechanical ventilation systems, parking lot activity, and truck loading and unloading activity. Potential impacts associated with these noise sources are analyzed below.

Mechanical Equipment Operations

At the time of preparation of this analysis, details were not available pertaining to the proposed rooftop mechanical ventilation systems for the proposed project; therefore, a reference noise level for typical rooftop mechanical ventilation systems was used. Noise levels from commercially available rooftop mechanical ventilation equipment range from 50 dBA to 60 dBA L_{eq} at a distance of 25 feet.

The nearest noise-sensitive receptor to proposed rooftop mechanical ventilation equipment is the multi-family residential building located northeast of the project site, across Montague Expressway. Rooftop mechanical ventilation equipment could be located approximately 300 feet from this closest sensitive receptor. At this distance, and assuming minimal shielding from the rooftop parapet, noise generated by typical rooftop mechanical ventilation equipment would attenuate to below 20 dBA L_{max}.

These noise levels would not exceed the most stringent noise performance standard of 55 dBA L_{max} for stationary noise sources as measured at any residential property line. The calculation spreadsheet with the detailed modeling assumptions is included in Appendix B.

If these operational noise levels were to occur for every hour for a 24-hour period, they would result in a reasonable worst-case noise level of 26 dBA DNL as measured at the nearest receiving residential property line. This noise level is below the City's operational noise threshold of 55 dBA DNL as measured at the nearest receiving residential property line.

In addition, since traffic noise levels are the dominant noise source in the project vicinity, the modeled traffic noise levels shown in Table 7 are representative of the ambient noise levels in the project vicinity. Therefore, these mechanical equipment operational noise levels would not exceed the documented existing traffic noise levels along Montague Expressway adjacent to these closest sensitive receptors, which are shown in Table 7 to average 77 dBA DNL as measured at 50 feet from the outermost travel lane. Therefore, these operational noise levels would not result in an increase of 5 dB or more above ambient sound levels.

Therefore, noise levels from on-site mechanical equipment operations would not generate a substantial temporary or permanent increase in ambient noise levels in the project vicinity in excess of standards established in the local general plan or noise ordinance, and the impact would be less than significant.

A discussion of the combined stationary source operational noise levels is provided below.

Parking Lot Activities

Typical parking lot activities include people conversing, doors shutting, and vehicles idling, which generate noise levels ranging from approximately 60 dBA to 70 dBA L_{max} at 50 feet. These activities are expected to occur sporadically throughout the day, as visitors and staff arrive and leave parking lot areas at the project site.

The nearest noise-sensitive receptors to proposed parking areas are the multi-family residential dwellings located northeast of the project site, across Montague Expressway. Proposed parking areas would be located approximately 215 feet from this closest sensitive receptor. At this distance, noise generated by typical parking lot activity would attenuate to below 51 dBA L_{max}. These noise levels would not exceed the most stringent noise performance standard of 55 dBA L_{max} for stationary noise sources as measured at any residential property line. The calculation spreadsheet with the detailed modeling assumptions is included in Appendix B.

If these operational noise levels were to occur for every hour for a 24-hour period, they would result in a reasonable worst-case noise level of 52 dBA DNL as measured at the nearest receiving residential property line. This noise level is below the City's operational noise threshold of 55 dBA DNL as measured at the nearest receiving residential property line.

In addition, since traffic noise levels are the dominant noise source in the project vicinity, the modeled traffic noise levels shown in Table 7 are representative of the ambient noise levels in the project vicinity. Therefore, these parking lot activity operational noise levels would not exceed the documented existing traffic noise levels along Montague Expressway adjacent to these closest sensitive receptors, which are shown in Table 7 to average 77 dBA DNL as measured at 50 feet from the outermost travel lane. Therefore, these operational noise levels would not result in an increase of 5 dB or more above ambient sound levels.

Therefore, noise levels from parking lot activity would not generate a substantial temporary or permanent increase in ambient noise levels in the project vicinity in excess of standards established in the local general plan or noise ordinance, and the impact would be less than significant.

A discussion of the combined stationary source operational noise levels is provided below.

Truck Loading Activities

Noise would be also generated by truck loading and unloading activities at the loading docks along the north side of Building 1, the north side of Building 2, the south side of Building 3, as shown on Figure 3. Typical noise levels from truck loading and unloading activity range from 70 dBA to 80 dBA L_{max} as measured at 50 feet. The maximum noise level range includes noise from associated truck loading/unloading activity, including trucks maneuvering, truck trailer loading, truck trailer unloading, backup alarms or beepers, and truck docking noise.

The nearest noise-sensitive receptors are the multi-family residential land use located northeast of the project site, across Montague Expressway, approximately 360 feet from the nearest proposed loading dock. The project includes a 10-foot-high sound wall that would block the line of sight from these closest loading docks and all off-sight residential receptors across Montague Expressway. So, at this distance and assuming appropriate noise reduction for the sound wall, noise generated by typical truck loading and unloading would attenuate to below 49 dBA L_{max}. These noise levels would not exceed the most stringent noise performance standard of 55 dBA L_{max} for stationary noise sources as measured at any residential property line. The calculation spreadsheet with the detailed modeling assumptions is included in Appendix B.

If these operational noise levels were to occur every hour for a 24-hour period, they would result in a reasonable worst-case noise level of 55 dBA DNL as measured at the nearest receiving residential property line. Therefore, this reasonable worst-case noise level would not exceed the City's operational noise threshold of 55 dBA DNL as measured at the nearest receiving residential property line and mitigation would be required.

In addition, these truck loading/unloading activity operational noise levels would not exceed the documented existing traffic noise levels along Montague Expressway adjacent to these closest sensitive receptors, which are shown in Table 7 to average 77 dBA DNL as measured at 50 feet from the outermost travel lane. Therefore, these operational noise levels would not result in an increase of 5 dB or more above ambient sound levels.

Therefore, noise levels from reasonable worst-case truck loading-unloading activity would not generate a substantial temporary or permanent increase in ambient noise levels in the project vicinity in excess of standards established in the local general plan or noise ordinance, and the impact would be less than significant.

A discussion of the combined stationary source operational noise levels is provided below.

Combined Stationary Source Operational Noise Impact Conclusion

Table 9, below, summarizes the calculated reasonable worst-case 24-hour noise levels for the combined noise level from simultaneous operation of all on-site stationary sources, as measured at the nearest residential property line.

Table 9: Stationary Source Operational Noise Levels (Sound Wall Option)

Noise Source	Distance to Nearest Residential Property Line (feet)	Worst-case 24-hour Noise Level (dBA DNL)	Worst-case 24-hour Thresholds (dBA, DNL)	Exceed Thresholds? (Yes/No)
Mechanical Ventilation Equipment	300	26	55	**No**
Truck Loading and Unloading Activities	360	55	55	**No**
Parking Lot Activities	215	42	55	**No**
Combined Noise Levels	**N/A**	**55**	**55**	**No**

Notes:
DBA = A-weighted decibel
DNL = Day-Night Level

This combined operational noise level is calculated at the closest residential receptor to the truck loading and unloading activity since that is the single loudest stationary noise source. As such, the proposed sound wall would also block the line of sight from the nearest parking lot stalls to this closest receptor as well, resulting in a minimum 10 dBA reduction for the calculated parking lot operational noise levels.

Therefore, as shown in Table 9, the calculated reasonable worst-case combined stationary source operational noise levels measured at the nearest residential property line would be 55 dBA DNL. The calculation spreadsheet with the detailed modeling assumptions is included in Appendix B. As a result, these combined stationary source operational noise levels would not exceed the noise performance standard of 55 dBA DNL for stationary noise sources as measured at the nearest residential property line. In addition, these combined reasonable worst-case operational noise levels

would not exceed the documented existing traffic noise levels along Montague Expressway adjacent to these closest sensitive receptors, which, as shown in Table 7, average 77 dBA DNL as measured at 50 feet from the outermost travel lane. Therefore, these operational noise levels would not result in an increase of 5 dB or more above ambient sound levels.

Therefore, stationary source operational noise impacts would be less than significant.

5.3 - Groundborne Vibration/Noise Levels

This section analyzes both construction and operational groundborne vibration and noise impacts. Groundborne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. Vibrating objects in contact with the ground radiate vibration waves through various soil and rock strata to the foundations of nearby buildings. Groundborne noise is generated when vibrating building components radiate sound, or noise generated by groundborne vibration. In general, if groundborne vibration levels do not exceed levels considered to be perceptible, then groundborne noise levels would not be perceptible in most interior environments. Therefore, this analysis focuses on determining exceedances of groundborne vibration levels.

5.3.1 - Short-term Construction Vibration Impacts

A significant impact would occur if the proposed project would generate groundborne vibration or groundborne noise levels in excess of established standards. According to General Plan Policy EC-2.3, a vibration limit of 0.08 inch per second (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.

Typical vibration source levels from construction equipment that could be used during project activities are summarized in Table 3 in the Characteristics of Groundborne Vibration and Noise section above.

The proposed project would not include pile driving of any kind or slurry wall equipment. Therefore, of the variety of equipment used during construction, the large vibratory rollers that could be used in the site preparation and roadway improvement phases of construction would produce the greatest groundborne vibration levels. Large vibratory rollers produce groundborne vibration levels ranging up to 0.210 in/sec PPV at 25 feet from the operating equipment.

The nearest off-site structure is the commercial building (which is not a sensitive historic structure but a building of normal conventional construction) located south of the project site, approximately 140 feet from the nearest construction footprint where a large vibratory roller would potentially operate. At this distance, groundborne vibration levels could range up to 0.015 in/sec PPV from operation of a large vibratory roller. This is below the City's standard of 0.08 in/sec PPV for sensitive historic structures and well below the 0.2 in/sec PPV for structures of normal conventional construction.

Therefore, the proposed project would not generate groundborne vibration and impacts would be less than significant.

5.3.2 - Operational Vibration Impacts

Implementation of the proposed project would not include any new permanent sources that would expose persons in the project vicinity to groundborne vibration levels that could be perceptible without instruments at any receiving property line. In addition, there are no existing significant permanent sources of groundborne vibration in the project vicinity to which the proposed project would be exposed. Therefore, project operational groundborne vibration level impacts would be less than significant.

5.4 - Excessive Noise Levels from Airport Activity

A significant impact would occur if the proposed project would expose people residing or working in the project area to excessive noise levels for a project located within the vicinity of a private airstrip or an Airport Land Use Compatibility Plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport.

The nearest airport to the project site is Norman Y. Mineta San José International Airport, located approximately 1.6 miles south of the site. The project site is well outside the 65 dBA CNEL airport noise contours and is not located within an Airport Land Use Compatibility Plan.

While aircraft noise is occasionally audible on the project site from aircraft flyovers, aircraft noise associated with nearby airport activity would not expose people residing or working near the project site to excessive noise levels. Therefore, implementation of the proposed project would not expose persons residing or working in the project vicinity to noise levels from airport activity that would be in excess of normally acceptable standards for residential land use development, and there would be no project impact associated with airport noise.

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Appendix A:

Noise Monitoring Data

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FCS
An ADEC Innovation

Project Number: 6211.0001 Sheet 1 of 3

Project Name: Montague Point Industrial

Test Personnel: Tanay Pradhan

NOISE MEASUREMENT SURVEY

Site Number: ST-1 Date: 11/10/2025 Time: From 2:56 PM to 3:11 PM

Site Location: West Corner of the site by the intersection of Montague Expressway and Zanker Road

Primary Noise Sources: Traffic Noise along Zanker Road and Montague Expressway

Measurement Results

	dBA
L_{eq}	63.6
L_{max}	75.5
L_{min}	51.6
L_{peak}	89.6
L_5	68.4
L_{10}	66.9
L_{50}	60.8
L_{90}	56.4
SEL	93.1

Observed Noise Sources/Events

Time	Noise Source/Event	dBA

Comments:

Equipment:

Settings: A-Weighted ☑ Other ☐

Measured Difference: dBA

Slow ☑ Fast ☐ Windscreen ☑

FCS
An ADEC Innovation

Project Number: 6211.0001 Sheet 1 of 3

Project Name: Montague Point Industrial

Test Personnel: Tanay Pradhan

NOISE MEASUREMENT SURVEY

Site Number: ST-2 Date: 11/10/2025 Time: From 3:35 PM to 3:50 PM

Site Location: Southeast corner of the Project site along River Oaks Parkway

Primary Noise Sources: Traffic Noise along River Oaks Parkway

Measurement Results

	dBA
L_{eq}	60.3
L_{max}	68.0
L_{min}	48.8
L_{peak}	83.5
L_5	64.3
L_{10}	63.5
L_{50}	59.1
L_{90}	52.6
SEL	89.9

Observed Noise Sources/Events

Time	Noise Source/Event	dBA

Comments:

Equipment:

Settings: A-Weighted ☑ Other ☐

Measured Difference: dBA

Slow ☑ Fast ☐ Windscreen ☑

FCS
An ADEC Innovation

Project Number: 6211.0001 Sheet 2 of 3

Project Name: Montague Point Industrial

Test Personnel: Tanay Pradhan

NOISE MEASUREMENT SURVEY

Site Number: ST-3 Date: 11/10/2025 Time: From 3:16 PM to 3:31 PM

Site Location: On-site along Montague Expressway across from the multifamily residences to the north

Primary Noise Sources: Traffic Noise along Montague Expressway, Parking lot Activity

Measurement Results

	dBA
L_{eq}	68.3
L_{max}	78.6
L_{min}	49.8
L_{peak}	94.7
L_5	72.1
L_{10}	71.6
L_{50}	67.0
L_{90}	57.8
SEL	97.9

Observed Noise Sources/Events

Time	Noise Source/Event	dBA

Comments:

Equipment:

Settings: A-Weighted ☑ Other ☐

Measured Difference: dBA

Slow ☑ Fast ☐ Windscreen ☑

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Appendix B:

Noise Modeling Data

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TABLE Existing-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 11/20/2025
ROADWAY SEGMENT: Montague Expressway - N. 1st Street to Research Place
NOTES: Montague Pointe Project - Existing

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 33100 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	NIGHT
AUTOS	82.40	9.60
M-TRUCKS	1.50	1.50
H-TRUCKS	2.50	2.50

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 77.16

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn			
70 Ldn	65 Ldn	60 Ldn	55 Ldn
211.3	452.9	974.4	2098.4

TABLE Existing-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 11/20/2025
ROADWAY SEGMENT: Montague Expressway - Research Place to River Oaks Parkway
NOTES: Montague Pointe Project - Existing

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 31600 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES	DAY	NIGHT
AUTOS	82.40	9.60
M-TRUCKS	1.50	1.50
H-TRUCKS	2.50	2.50

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 76.96

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn			
70 Ldn	65 Ldn	60 Ldn	55 Ldn
205.0	439.1	944.8	2034.5

TABLE Existing-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 11/20/2025
ROADWAY SEGMENT: Junction Avenue - Zanker Road to E. Plumeria Drive
NOTES: Montague Pointe Project - Existing

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2200 SPEED (MPH): 40 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	82.40	9.60
M-TRUCKS	1.50	1.50
H-TRUCKS	2.50	2.50

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.99

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	65.1	139.8	300.8

TABLE Background-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 11/20/2025
ROADWAY SEGMENT: Montague Expressway - N. 1st Street to Research Place
NOTES: Montague Pointe Project - Background

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 34400 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	82.40	9.60
M-TRUCKS	1.50	1.50
H-TRUCKS	2.50	2.50

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 77.32

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
216.7	464.6	999.7	2153.0

TABLE Background-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 11/20/2025
ROADWAY SEGMENT: Montague Expressway - Research Place to River Oaks Parkway
NOTES: Montague Pointe Project - Background

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 32800 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	82.40	9.60
M-TRUCKS	1.50	1.50
H-TRUCKS	2.50	2.50

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 77.12

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
210.1	450.1	968.5	2085.7

TABLE Background-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 11/20/2025
ROADWAY SEGMENT: Junction Avenue - Zanker Road to E. Plumeria Drive
NOTES: Montague Pointe Project - Background

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2200 SPEED (MPH): 40 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	82.40	9.60
M-TRUCKS	1.50	1.50
H-TRUCKS	2.50	2.50

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.99

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	65.1	139.8	300.8

TABLE Background Plus Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 11/20/2025
ROADWAY SEGMENT: Montague Expressway - N. 1st Street to Research Place
NOTES: Montague Pointe Project - Background Plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 34400 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	82.40	9.60
M-TRUCKS	1.50	1.50
H-TRUCKS	2.50	2.50

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 77.32

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
216.7	464.6	999.7	2153.0

TABLE Background Plus Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 11/20/2025
ROADWAY SEGMENT: Montague Expressway - Research Place to River Oaks Parkway
NOTES: Montague Pointe Project - Background Plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 32800 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	82.40	9.60
M-TRUCKS	1.50	1.50
H-TRUCKS	2.50	2.50

ACTIVE HALF-WIDTH (FT): 24 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 77.12

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
210.1	450.1	968.5	2085.7

TABLE Background Plus Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 11/20/2025
ROADWAY SEGMENT: Junction Avenue - Zanker Road to E. Plumeria Drive
NOTES: Montague Pointe Project - Background Plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2500 SPEED (MPH): 40 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	NIGHT
AUTOS	82.40	9.60
M-TRUCKS	1.50	1.50
H-TRUCKS	2.50	2.50

ACTIVE HALF-WIDTH (FT): 6 SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.55

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

70 Ldn	65 Ldn	60 Ldn	55 Ldn
0.0	70.8	152.2	327.6

Mobile Construction Activity Noise Calculation

Receiving residential land use									
	Reference (dBA) 50 ft		Usage	Distance to	Ground	Shielding	Calculated (dBA)		
Equipment Description	Lmax	Quantity	factor[1]	Receptor [2]	Effect[3]	(dBA)[4]	Lmax	Leq	Energy
Grader	85	1	40	205	1	0	66.6	62.6	1835305.73
Excavator	85	1	40	255	1	0	63.8	59.8	953563.158
Dozer	85	1	40	255	1	0	63.8	59.8	953563.158
Front End Loader	80	1	40	255	1	0	58.8	54.8	301543.147
Backhoe	80	1	40	255	1	0	58.8	54.8	301543.147
						Lmax[5]	67	Leq	66

Notes:
[1] Percentage of time activity occurs each hour based on FHWA usage factors
[2] Distance assumes one piece of equipment adjacent to project boundary and others at the closest reasonable operating distance away
[3] Soft ground terrain between project site and receptor.
[4] Shielding due to terrain or structures
[5] Calculated Lmax is the loudest value.

Distance to Receptor (feet)		8 Hour Average Calculation				
			Time	Hourly Leq	Leq'	0.1*Leq	antiLog
		Night	12:00 AM	0.0	10.0	1	10
			1:00 AM	0.0	10.0	1	10
			2:00 AM	0.0	10.0	1	10
			3:00 AM	0.0	10.0	1	10
			4:00 AM	0.0	10.0	1	10
			5:00 AM	0.0	10.0	1	10
			6:00 AM	0.0	10.0	1	10
		Day	7:00 AM	0.0	0.0	0	1
	205		8:00 AM	66.4	66.4	6.638041587	4345518.34
	255		9:00 AM	65.4	65.4	6.539549769	3463775.77
	305		10:00 AM	63.1	63.1	6.306270793	2024280.97
	355		11:00 AM	61.1	61.1	6.108485252	1283764.17
	Lunch break		12:00 PM	0.0	0.0	0	1
	405		1:00 PM	59.4	59.4	5.936805241	864580.112
	455		2:00 PM	57.9	57.9	5.785136121	609727.974
	505		3:00 PM	56.5	56.5	5.649296176	445960.277
	555		4:00 PM	55.3	55.3	5.526291361	335962.931
			5:00 PM	0.0	0.0	0	1
Notes: *Equipment is measured as			6:00 PM	0.0	0.0	0	1
operating across the project site		Evening	7:00 PM	0.0	5.0	0.5	3.16227766
			8:00 PM	0.0	5.0	0.5	3.16227766
			9:00 PM	0.0	5.0	0.5	3.16227766
		Night	10:00 PM	0.0	10.0	1	10
			11:00 PM	0.0	10.0	1	10
					Sum		13373674
					Sum/8		1671709.25
					Log10(Sum/8)		6.22316075
					10*Log10(Sum/8)		62.2316075
					8 Hour Average		62

Receiving residential land use									
	Reference (dBA) 50 ft		Usage	Distance to	Ground	Shielding	Calculated (dBA)		
Equipment Description	Lmax	Quantity	factor[1]	Receptor [2]	Effect[3]	(dBA)[4]	Lmax	Leq	Energy
Grader	85	1	40	255	1	0	70.8	59.8	953563.158
Excavator	85	1	40	255	1	0	70.8	59.8	953563.158
Dozer	85	1	40	255	1	0	70.8	59.8	953563.158
Front End Loader	80	1	40	255	1	0	65.8	54.8	301543.147
Backhoe	80	1	40	255	1	0	65.8	54.8	301543.147
								Leq	65

Receiving residential land use									
	Reference (dBA) 50 ft		Usage	Distance to	Ground	Shielding	Calculated (dBA)		
Equipment Description	Lmax	Quantity	factor[1]	Receptor [2]	Effect[3]	(dBA)[4]	Lmax	Leq	Energy
Grader	85	1	40	305	1	0	69.3	57.5	557276.188
Excavator	85	1	40	305	1	0	69.3	57.5	557276.188
Dozer	85	1	40	305	1	0	69.3	57.5	557276.188
Front End Loader	80	1	40	305	1	0	64.3	52.5	176226.204
Backhoe	80	1	40	305	1	0	64.3	52.5	176226.204

	Leq	63

Receiving residential land use									
	Reference (dBA) 50 ft		Usage	Distance to	Ground	Shielding	Calculated (dBA)		
Equipment Description	Lmax	Quantity	factor[1]	Receptor [2]	Effect[3]	(dBA)[4]	Lmax	Leq	Energy
Grader	85	1	40	355	1	0	68.0	55.5	353414.973
Excavator	85	1	40	355	1	0	68.0	55.5	353414.973
Dozer	85	1	40	355	1	0	68.0	55.5	353414.973
Front End Loader	80	1	40	355	1	0	63.0	50.5	111759.627
Backhoe	80	1	40	355	1	0	63.0	50.5	111759.627
							Leq		61

Receiving residential land use									
	Reference (dBA) 50 ft		Usage	Distance to	Ground	Shielding	Calculated (dBA)		
Equipment Description	Lmax	Quantity	factor[1]	Receptor [2]	Effect[3]	(dBA)[4]	Lmax	Leq	Energy
Grader	85	1	40	405	1	0	66.8	53.8	238015.333
Excavator	85	1	40	405	1	0	66.8	53.8	238015.333
Dozer	85	1	40	405	1	0	66.8	53.8	238015.333
Front End Loader	80	1	40	405	1	0	61.8	48.8	75267.0569
Backhoe	80	1	40	405	1	0	61.8	48.8	75267.0569
							Leq		59

Receiving residential land use									
	Reference (dBA) 50 ft		Usage	Distance to	Ground	Shielding	Calculated (dBA)		
Equipment Description	Lmax	Quantity	factor[1]	Receptor [2]	Effect[3]	(dBA)[4]	Lmax	Leq	Energy
Grader	85	1	40	455	1	0	65.8	52.2	167855.592
Excavator	85	1	40	455	1	0	65.8	52.2	167855.592
Dozer	85	1	40	455	1	0	65.8	52.2	167855.592
Front End Loader	80	1	40	455	1	0	60.8	47.2	53080.5989
Backhoe	80	1	40	455	1	0	60.8	47.2	53080.5989
							Leq		58

Receiving residential land use									
	Reference (dBA) 50 ft		Usage	Distance to	Ground	Shielding	Calculated (dBA)		
Equipment Description	Lmax	Quantity	factor[1]	Receptor [2]	Effect[3]	(dBA)[4]	Lmax	Leq	Energy
Grader	85	1	40	505	1	0	64.9	50.9	122771.022
Excavator	85	1	40	505	1	0	64.9	50.9	122771.022
Dozer	85	1	40	505	1	0	64.9	50.9	122771.022
Front End Loader	80	1	40	505	1	0	59.9	45.9	38823.6059
Backhoe	80	1	40	505	1	0	59.9	45.9	38823.6059
							Leq		56

Receiving residential land use									
	Reference (dBA) 50 ft		Usage	Distance to	Ground	Shielding	Calculated (dBA)		
Equipment Description	Lmax	Quantity	factor[1]	Receptor [2]	Effect[3]	(dBA)[4]	Lmax	Leq	Energy
Grader	85	1	40	555	1	0	64.1	49.7	92489.2068
Excavator	85	1	40	555	1	0	64.1	49.7	92489.2068
Dozer	85	1	40	555	1	0	64.1	49.7	92489.2068
Front End Loader	80	1	40	555	1	0	59.1	44.7	29247.6553
Backhoe	80	1	40	555	1	0	59.1	44.7	29247.6553
							Leq		55

Commercial-Grade Mechanical Equipment Noise Calculation

Receiving residential land use	Noise Level Calculation Prior to Implementation of Noise Attenuation Requirements								
	Reference (dBA) 3 ft		Usage	Distance to Receptor	Ground	Shielding	Calculated (dBA)		
Equipment Description	**Lmax**	**Quantity**	**factor[1]**	**(feet)**	**Effect[2]**	**(dBA)[3]**	**Lmax**	**Leq**	**Energy**
Commercial grade mechanical ventilation equipment	78	1	80	300	1	3	15.0	14.0	25.2982213
Commercial grade mechanical ventilation equipment	78	1	80	325	1	3	14.0	13.0	19.8977362
Commercial grade mechanical ventilation equipment	78	1	80	350	1	3	13.0	12.0	15.9312414
Commercial grade mechanical ventilation equipment	78	1	80	375	1	3	12.1	11.1	12.9526893
Commercial grade mechanical ventilation equipment	78	1	80	400	1	3	11.3	10.3	10.6726871
Commercial grade mechanical ventilation equipment	78	1	80	425	1	3	10.5	9.5	8.89788854
						Lmax[4]	**15**	**Leq**	**20**

Notes:
[1] Percentage of time activity occurs each hour
[2] Soft ground terrain between project site and receptor.
[3] Shielding due to rooftop parapet/structural shielding

Ldn Calculations					
	Time	Hourly Leq	Leq'	0.1*Leq	antiLog
Night	12:00 AM	19.7	29.7	2.97150993	936.504638
	1:00 AM	19.7	29.7	2.97150993	936.504638
	2:00 AM	19.7	29.7	2.97150993	936.504638
	3:00 AM	19.7	29.7	2.97150993	936.504638
	4:00 AM	19.7	29.7	2.97150993	936.504638
	5:00 AM	19.7	29.7	2.97150993	936.504638
	6:00 AM	19.7	29.7	2.97150993	936.504638
Day	7:00 AM	19.7	19.7	1.97150993	93.6504638
	8:00 AM	19.7	19.7	1.97150993	93.6504638
	9:00 AM	19.7	19.7	1.97150993	93.6504638
	10:00 AM	19.7	19.7	1.97150993	93.6504638
	11:00 AM	19.7	19.7	1.97150993	93.6504638
	12:00 PM	19.7	19.7	1.97150993	93.6504638
	1:00 PM	19.7	19.7	1.97150993	93.6504638
	2:00 PM	19.7	19.7	1.97150993	93.6504638
	3:00 PM	19.7	19.7	1.97150993	93.6504638
	4:00 PM	19.7	19.7	1.97150993	93.6504638
	5:00 PM	19.7	19.7	1.97150993	93.6504638
	6:00 PM	19.7	19.7	1.97150993	93.6504638
	7:00 PM	19.7	19.7	1.97150993	93.6504638
	8:00 PM	19.7	19.7	1.97150993	93.6504638
	9:00 PM	19.7	19.7	1.97150993	93.6504638
Night	10:00 PM	19.7	29.7	2.97150993	936.504638
	11:00 PM	19.7	29.7	2.97150993	936.504638
			Sum		9833.2987
			Sum/24		409.720779
			Log10(Sum/24)		2.61248799
			10*Log10(Sum/24)		26.1248799
			24 Hour Ldn		**26**

Parking Lot Activity Noise Calculation

Receiving residential land use									
	Reference (dBA) 50 ft			Distance to Receptor	Ground	Shielding	Calculated (dBA)		
Equipment Description	**Lmax**	**Quantity**	**Usage factor[1]**	**(feet)**	**Effect[2]**	**(dBA)[3]**	**Lmax**	**Leq**	**Energy**
parking lot activity	70	5	2	215	1	0	51.0	41.0	12577.5089
parking lot activity	70	5	2	225	1	0	50.4	40.4	10973.9369
parking lot activity	70	5	2	245	1	0	49.3	39.3	8499.859752
parking lot activity	70	5	2	260	1	0	48.5	38.5	7111.970869
						Lmax[4]	**51**	**Leq**	**46**

Notes:
[1] Percentage of time activity occurs each hour
[2] Soft ground terrain between project site and receptor.
[3] Shielding due to terrain or structures
[4] Calculated Lmax is the Loudest value.

Ldn Calculations					
	Time	Hourly Leq	Leq'	0.1*Leq	antiLog
Night	12:00 AM	45.9	55.9	5.592879018	391632.7642
	1:00 AM	45.9	55.9	5.592879018	391632.7642
	2:00 AM	45.9	55.9	5.592879018	391632.7642
	3:00 AM	45.9	55.9	5.592879018	391632.7642
	4:00 AM	45.9	55.9	5.592879018	391632.7642
	5:00 AM	45.9	55.9	5.592879018	391632.7642
	6:00 AM	45.9	55.9	5.592879018	391632.7642
Day	7:00 AM	45.9	45.9	4.592879018	39163.27642
	8:00 AM	45.9	45.9	4.592879018	39163.27642
	9:00 AM	45.9	45.9	4.592879018	39163.27642
	10:00 AM	45.9	45.9	4.592879018	39163.27642
	11:00 AM	45.9	45.9	4.592879018	39163.27642
	12:00 PM	45.9	45.9	4.592879018	39163.27642
	1:00 PM	45.9	45.9	4.592879018	39163.27642
	2:00 PM	45.9	45.9	4.592879018	39163.27642
	3:00 PM	45.9	45.9	4.592879018	39163.27642
	4:00 PM	45.9	45.9	4.592879018	39163.27642
	5:00 PM	45.9	45.9	4.592879018	39163.27642
	6:00 PM	45.9	45.9	4.592879018	39163.27642
	7:00 PM	45.9	45.9	4.592879018	39163.27642
	8:00 PM	45.9	45.9	4.592879018	39163.27642
	9:00 PM	45.9	45.9	4.592879018	39163.27642
Night	10:00 PM	45.9	55.9	5.592879018	391632.7642
	11:00 PM	45.9	55.9	5.592879018	391632.7642
			Sum		4112144.024
			Sum/24		171339.3343
			Log10(Sum/24)		5.233857075
			10*Log10(Sum/24)		52.33857075
			24 Hour Ldn		**52**

Parking Lot Activity Noise Calculation Assuming Shielding from 10 ft Sound Wall

Receiving residential land use									
	Reference (dBA) 50 ft			Distance to Receptor	Ground	Shielding	Calculated (dBA)		
Equipment Description	**Lmax**	**Quantity**	**Usage factor[1]**	**(feet)**	**Effect[2]**	**(dBA)[3]**	**Lmax**	**Leq**	**Energy**
parking lot activity	70	5	2	215	1	10	41.0	31.0	1257.75089
parking lot activity	70	5	2	225	1	10	40.4	30.4	1097.39369
parking lot activity	70	5	2	245	1	10	39.3	29.3	849.9859752
parking lot activity	70	5	2	260	1	10	38.5	28.5	711.1970869
						Lmax[4]	**41**	**Leq**	**36**

Notes:
[1] Percentage of time activity occurs each hour
[2] Soft ground terrain between project site and receptor.
[3] Shielding due to terrain or structures
[4] Calculated Lmax is the Loudest value.

Ldn Calculations					
	Time	Hourly Leq	Leq'	0.1*Leq	antiLog
Night	12:00 AM	35.9	45.9	4.592879018	39163.27642
	1:00 AM	35.9	45.9	4.592879018	39163.27642
	2:00 AM	35.9	45.9	4.592879018	39163.27642
	3:00 AM	35.9	45.9	4.592879018	39163.27642
	4:00 AM	35.9	45.9	4.592879018	39163.27642
	5:00 AM	35.9	45.9	4.592879018	39163.27642
	6:00 AM	35.9	45.9	4.592879018	39163.27642
Day	7:00 AM	35.9	35.9	3.592879018	3916.327642
	8:00 AM	35.9	35.9	3.592879018	3916.327642
	9:00 AM	35.9	35.9	3.592879018	3916.327642
	10:00 AM	35.9	35.9	3.592879018	3916.327642
	11:00 AM	35.9	35.9	3.592879018	3916.327642
	12:00 PM	35.9	35.9	3.592879018	3916.327642
	1:00 PM	35.9	35.9	3.592879018	3916.327642
	2:00 PM	35.9	35.9	3.592879018	3916.327642
	3:00 PM	35.9	35.9	3.592879018	3916.327642
	4:00 PM	35.9	35.9	3.592879018	3916.327642
	5:00 PM	35.9	35.9	3.592879018	3916.327642
	6:00 PM	35.9	35.9	3.592879018	3916.327642
	7:00 PM	35.9	35.9	3.592879018	3916.327642
	8:00 PM	35.9	35.9	3.592879018	3916.327642
	9:00 PM	35.9	35.9	3.592879018	3916.327642
Night	10:00 PM	35.9	45.9	4.592879018	39163.27642
	11:00 PM	35.9	45.9	4.592879018	39163.27642
				Sum	411214.4024
				Sum/24	17133.93343
				Log10(Sum/24)	4.233857075
				10*Log10(Sum/24)	42.33857075
				24 Hour Ldn	**42**

Loading/Unloading Activity Noise Calculation

Receiving residential land use									
	Reference (dBA) 50 ft		Usage	Distance to Receptor	Ground	Shielding	Calculated (dBA)		
Equipment Description	**Lmax**	**Quantity**	**factor[1]**	**(feet)**	**Effect[2]**	**(dBA)[3]**	**Lmax**	**Leq**	**Energy**
Loading/Unloading Noise Calculation	80	4	25	360	1	10	44.3	44.3	26791.83813
Loading/Unloading Noise Calculation	80	4	25	375	1	10	43.7	43.7	23703.7037
Loading/Unloading Noise Calculation	80	4	25	390	1	10	43.2	43.2	21072.50628
						Lmax[4]	**44**	**Leq**	**49**

Notes:
[1] Percentage of time activity occurs each hour
[2] Soft ground (landscaped) terrain between project site and receptor.
[3] Shielding due to proposed 10-foot soundwall on property line
[4] Calculated Lmax is the Loudest value.

NOTE: These default tables assume 24-hour operations

Ldn Calculations

	Time	Hourly Leq	Leq'	0.1*Leq	antiLog
Night	12:00 AM	48.5	58.5	5.854719173	715680.4812
	1:00 AM	48.5	58.5	5.854719173	715680.4812
	2:00 AM	48.5	58.5	5.854719173	715680.4812
	3:00 AM	48.5	58.5	5.854719173	715680.4812
	4:00 AM	48.5	58.5	5.854719173	715680.4812
	5:00 AM	48.5	58.5	5.854719173	715680.4812
	6:00 AM	48.5	58.5	5.854719173	715680.4812
Day	7:00 AM	48.5	48.5	4.854719173	71568.04812
	8:00 AM	48.5	48.5	4.854719173	71568.04812
	9:00 AM	48.5	48.5	4.854719173	71568.04812
	10:00 AM	48.5	48.5	4.854719173	71568.04812
	11:00 AM	48.5	48.5	4.854719173	71568.04812
	12:00 PM	48.5	48.5	4.854719173	71568.04812
	1:00 PM	48.5	48.5	4.854719173	71568.04812
	2:00 PM	48.5	48.5	4.854719173	71568.04812
	3:00 PM	48.5	48.5	4.854719173	71568.04812
	4:00 PM	48.5	48.5	4.854719173	71568.04812
	5:00 PM	48.5	48.5	4.854719173	71568.04812
	6:00 PM	48.5	48.5	4.854719173	71568.04812
	7:00 PM	48.5	48.5	4.854719173	71568.04812
	8:00 PM	48.5	48.5	4.854719173	71568.04812
	9:00 PM	48.5	48.5	4.854719173	71568.04812
Night	10:00 PM	48.5	58.5	5.854719173	715680.4812
	11:00 PM	48.5	58.5	5.854719173	715680.4812
			Sum		7514645.052
			Sum/24		313110.2105
			Log10(Sum/24)		5.49569723
			10*Log10(Sum/24)		54.9569723
			24 Hour Ldn		**55**

PPVequip = PPVref x (25/D)^1.5

Input the desired calculation distance into "yellow" cells

	"D"	PPVequip	Lvequip
Pile driver (impact)	NA	NA	NA
Pile driver (sonic)	NA	NA	NA
Clam shovel drop (slurry wall)	NA	NA	NA
Hydromill (slurry wall) - in soil	NA	NA	NA
Hydromill (slurry wall) - in rock	NA	NA	NA
Vibratory roller	140	0.016	71.6
Hoe ram	140	0.007	64.6
Large bulldozer	140	0.007	64.6
Caisson drilling	140	0.007	64.6
Loaded trucks	140	0.006	63.6
Jackhammer	140	0.003	56.6
Small bulldozer	140	0.000	35.6