Appendix I

Acoustical Assessment

Acoustical Assessment
469 Piercy Road Project
City of San José, California

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Exhibits

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LIST OF ABBREVIATED TERMS

APN	Assessor's Parcel Number
ADT	average daily traffic
ASTM	American Society for Testing and Materials
dBA	A-weighted sound level
CEQA	California Environmental Quality Act
CNEL	community equivalent noise level
L_{dn}	day-night noise level
dB	decibel
du/ac	dwelling units per acre
L_{eq}	equivalent noise level
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
HVAC	heating ventilation and air conditioning
Hz	hertz
in/sec	inches per second
LUD	Land Use Designation
L_{max}	maximum noise level
µPa	micropascals
L_{min}	minimum noise level
PPV	peak particle velocity
RMS	root mean square
STC	Sound Transmission Class
sf	square feet
TNM	Traffic Noise Model
VdB	vibration velocity level

1 INTRODUCTION

This report documents the results of an Acoustical Assessment completed for the 469 Piercy Road Project ("project" or "proposed project"). The purpose of this Acoustical Assessment is to evaluate the project's potential construction and operational noise and vibration levels associated with the project and determine the level of impact the project would have on the environment.

1.1 PROJECT LOCATION

The proposed project is located at 469 Piercy Road in San José. Figure 1: Regional Vicinity and Figure 2: Site Vicinity, depict the project site in a regional and local context. The project site is located in an urban area with a mix of surrounding uses including commercial, office, residential and industrial uses. To the east of the project site is open space. The proposed project's existing land use designation is Industrial Park (IP) and existing zoning designation is Combined Industrial/Commercial (CIC) Zoning District. The project site is currently developed with an approximately 6,939 square foot (sf) single-family residence and a detached garage structure.

1.2 PROJECT DESCRIPTION

The project intends to redevelop the property as a modern industrial facility. The proposed project would demolish the existing single-family residential structure and redevelop the property with a new approximately 134,605 (sf) warehouse building. The proposed single-story warehouse building would contain approximately 129,605 sf of warehouse space and 5,000 sf of office space refer to Figure 3: Project Site Plan. The warehouse building would include 18 dock doors on its northern side. The proposed project includes surface parking with 86 automobile (passenger vehicle) spaces. Of the 86 automobile spaces provided, 35 would be electric vehicle (EV) capable. In addition, 10 bicycle racks and 4 motorcycle parking spaces would be provided.

Access to the project site would be provided by two driveways, a 32-foot wide driveway located on the northeast corner of the site off Piercy Road and a 26-foot wide driveway located on the southwest corner of the site off Hellyer Avenue. The Piercy Road driveway would provide access for trucks and trailers, in addition to passenger vehicles. The Hellyer Avenue driveway would provide primary access for passenger vehicles.

The proposed project would be constructed over the course of approximately 13 months. Demolition is anticipated to occur for one month prior to a 12-month construction phase. The proposed project would require approximately 1,655 cubic yards (cy) of soil export during the grading phases of construction.

Source: USGS, 2021

Figure 1: Regional Map

469 Piercy Road Project

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Source: Nearmap, 2022

Figure 2 Project Vicinity Map

469 Piercy Road Project

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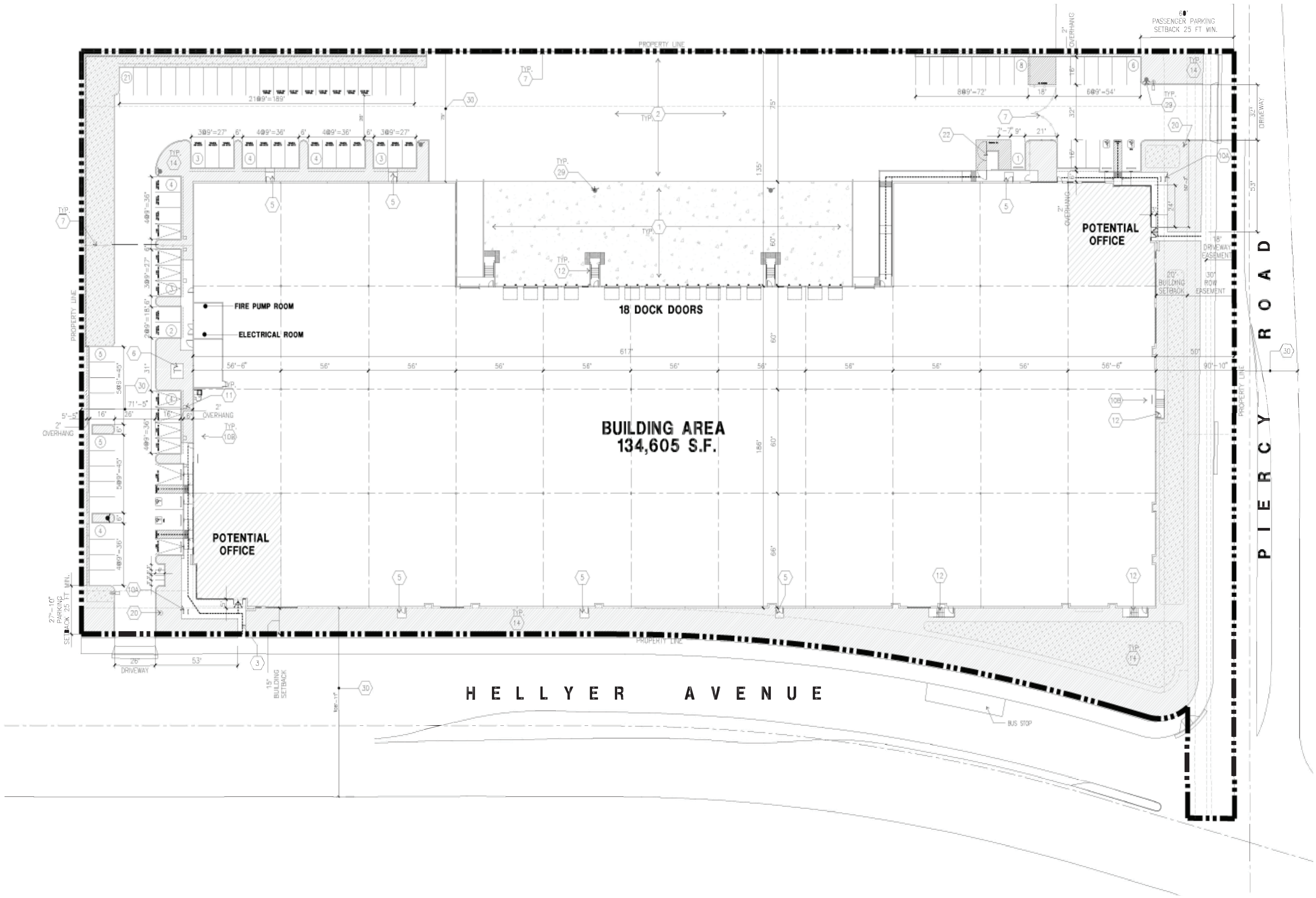

Source: Kier + Wright, 2022

Figure 3: Project Site Plan

469 Piercy Road Project

Not to scale

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2 ACOUSTIC FUNDAMENTALS

2.1 SOUND AND ENVIRONMENTAL NOISE

Acoustics is the science of sound. Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a medium (e.g. air) to human (or animal) ear. If the pressure variations occur frequently enough (at least 20 times per second), they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound and is expressed as cycles per second, or hertz (Hz).

Noise is defined as loud, unexpected, or annoying sound. The fundamental acoustics model consists of a noise source, receptor, and the propagation path between the two. The loudness of the noise source, obstructions, or atmospheric factors affecting the propagation path, determine the perceived sound level and noise characteristics at the receptor. Acoustics deal primarily with the propagation and control of sound. A typical noise environment consists of ambient noise that is the sum of many distant and indistinguishable noise sources. Superimposed on this ambient noise is the sound from individual local sources. These sources can vary from an occasional aircraft or train passing by to continuous noise from traffic on a major highway. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a large range of numbers. To avoid this, the decibel (dB) scale was devised. The dB scale uses the hearing threshold of 20 micropascals (μPa) as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The dB scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels correspond closely to human perception of relative loudness. Table 1: Typical Noise Levels provides typical noise levels.

Table 1: Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	– 110 –	Rock Band
Jet fly-over at 1,000 feet		
	– 100 –	
Gas lawnmower at 3 feet		
	– 90 –	
Diesel truck at 50 feet at 50 miles per hour		Food blender at 3 feet
	– 80 –	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawnmower, 100 feet	– 70 –	Vacuum cleaner at 10 feet
Commercial area		Normal Speech at 3 feet
Heavy traffic at 300 feet	– 60 –	
		Large business office
Quiet urban daytime	– 50 –	Dishwasher in next room
Quiet urban nighttime	– 40 –	Theater, large conference room (background)
Quiet suburban nighttime		
	– 30 –	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	– 20 –	
		Broadcast/recording studio
	– 10 –	
Lowest threshold of human hearing	– 0 –	Lowest threshold of human hearing
Source: California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, September 2013.		

Noise Descriptors

The dB scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Several rating scales have been developed to analyze the adverse effect of community noise on people. Because environmental noise fluctuates over time, these scales consider that the effect of noise on people is largely dependent on the total acoustical energy content of the noise, as well as the time of day when the noise occurs. The equivalent noise level (L_{eq}) represents the continuous sound pressure level over the measurement period, while the day-night noise level (L_{dn}) and Community Equivalent Noise Level (CNEL) are measures of energy average during a 24-hour period, with dB weighted sound levels from 7:00 p.m. to 7:00 a.m. Most commonly, environmental sounds are described in terms of L_{eq} that has the same acoustical energy as the summation of all the time-varying events. Each is applicable to this analysis and defined Table 2: Definitions of Acoustical Terms.

Table 2: Definitions of Acoustical Terms

Term	Definitions
Decibel (dB)	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in µPa (or 20 micronewtons per square meter), where 1 pascals is the pressure resulting from a force of 1 newton exerted over an area of 1 square meter. The sound pressure level is expressed in dB as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g. 20 µPa). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency (Hz)	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level (dBA)	The sound pressure level in dB as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level (L_{eq})	The average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.
Maximum Noise Level (L_{max}) Minimum Noise Level (L_{min})	The maximum and minimum dBA during the measurement period.
Exceeded Noise Levels (L_1, L_{10}, L_{50}, L_{90})	The dBA values that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day-Night Noise Level (L_{dn})	A 24-hour average Leq with a 10 dBA weighting added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity at nighttime. The logarithmic effect of these additions is that a 60 dBA 24-hour Leq would result in a measurement of 66.4 dBA L_{dn}.
Community Noise Equivalent Level (CNEL)	A 24-hour average Leq with a 5 dBA weighting during the hours of 7:00 a.m. to 10:00 a.m. and a 10 dBA weighting added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively. The logarithmic effect of these additions is that a 60 dBA 24-hour Leq would result in a measurement of 66.7 dBA CNEL.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.

Term	Definitions
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends on its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

The A-weighted decibel (dBA) sound level scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be used. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends on the distance between the receptor and the noise source.

A-Weighted Decibels

The perceived loudness of sounds is dependent on many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable and can be approximated by dBA values. There is a strong correlation between dBA and the way the human ear perceives sound. For this reason, the dBA has become the standard tool of environmental noise assessment. All noise levels reported in this document are in terms of dBA, but are expressed as dB, unless otherwise noted.

Addition of Decibels

The dB scale is logarithmic, not linear, and therefore sound levels cannot be added or subtracted through ordinary arithmetic. Two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic dB is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70-dBA sound is half as loud as an 80-dBA sound and twice as loud as a 60-dBA sound. When two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dBA higher than one source under the same conditions. Under the dB scale, three sources of equal loudness together would produce an increase of approximately 5 dBA.

Sound Propagation and Attenuation

Sound spreads (propagates uniformly outward in a spherical pattern, and the sound level decreases (attenuates) at a rate of approximately 6 dB for each doubling of distance from a stationary or point source. Sound from a line source, such as a highway, propagates outward in a cylindrical pattern. Sound levels attenuate at a rate of approximately 3 dB for each doubling of distance from a line source, such as a roadway, depending on ground surface characteristics. No excess attenuation is assumed for hard surfaces like a parking lot or a body of water. Soft surfaces, such as soft dirt or grass, can absorb sound, so an excess ground-attenuation value of 1.5 dB per doubling of distance is normally assumed. For line sources, an overall attenuation rate of 3 dB per doubling of distance is assumed.

Noise levels may also be reduced by intervening structures; generally, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm reduces noise levels by 5 to 10 dBA. The way older homes in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows. The exterior-to-interior reduction of newer residential units is generally 30 dBA or more.

Human Response to Noise

The human response to environmental noise is subjective and varies considerably from individual to individual. Noise in the community has often been cited as a health problem, not in terms of actual physiological damage, such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities, including sleep, speech, recreation, and tasks that demand concentration or coordination. Hearing loss can occur at the highest noise intensity levels.

Noise environments and consequences of human activities are usually well represented by median noise levels during the day or night or over a 24-hour period. Environmental noise levels are generally considered low when the CNEL is below 60 dBA, moderate in the 60 to 70 dBA range, and high above 70 dBA. Examples of low daytime levels are isolated, natural settings with noise levels as low as 20 dBA and quiet, suburban, residential streets with noise levels around 40 dBA. Noise levels above 45 dBA at night can disrupt sleep. Examples of moderate-level noise environments are urban residential or semi-commercial areas (typically 55 to 60 dBA) and commercial locations (typically 60 dBA). People may consider louder environments adverse, but most will accept the higher levels associated with noisier urban residential or residential-commercial areas (60 to 75 dBA) or dense urban or industrial areas (65 to 80 dBA). Regarding increases in dBA, the following relationships should be noted:

- Except in carefully controlled laboratory experiments, a 1-dBA change cannot be perceived by humans.
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference.
- A minimum 5-dBA change is required before any noticeable change in community response would be expected. A 5-dBA increase is typically considered substantial.
- A 10-dBA change is subjectively heard as an approximate doubling in loudness and would almost certainly cause an adverse change in community response.

Effects of Noise on People

Hearing Loss. While physical damage to the ear from an intense noise impulse is rare, a degradation of auditory acuity can occur even within a community noise environment. Hearing loss occurs mainly due to chronic exposure to excessive noise but may be due to a single event such as an explosion. Natural hearing loss associated with aging may also be accelerated from chronic exposure to loud noise. The Occupational Safety and Health Administration has a noise exposure standard that is set at the noise threshold where hearing loss may occur from long-term exposures. The maximum allowable level is 90 dBA averaged over 8 hours. If the noise is above 90 dBA, the allowable exposure time is correspondingly shorter.

Annoyance. Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The L_{dn} as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources. A noise level of about 55 dBA L_{dn} is the threshold at which a substantial percentage of people begin to report annoyance[1].

2.2 GROUNDBORNE VIBRATION

Sources of groundborne vibrations include natural phenomena (earthquakes, volcanic eruptions, sea waves, landslides, etc.) or man-made causes (explosions, machinery, traffic, trains, construction equipment, etc.). Vibration sources may be continuous (e.g. factory machinery) or transient (e.g. explosions). Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude, including Vibration Decibels (VdB), peak particle velocity (PPV), and the root mean square (RMS) velocity. VdB is the vibration velocity level in the decibel scale. PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. The RMS velocity is defined as the average of the squared amplitude of the signal. The PPV and RMS vibration velocity amplitudes are used to evaluate human response to vibration.

Table 3: Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibrations, displays the reactions of people and the effects on buildings produced by continuous vibration levels. The annoyance levels shown in the table should be interpreted with care since vibration may be found to be annoying at much lower levels than those listed, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. In high noise environments, which are more prevalent where groundborne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

Table 3: Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibrations

Maximum PPV (in/sec)	Vibration Annoyance Potential Criteria	Vibration Damage Potential Threshold Criteria	FTA Vibration Damage Criteria
0.008	-	Extremely fragile historic buildings, ruins, ancient monuments	-
0.01	Barely Perceptible	-	-
0.04	Distinctly Perceptible	-	-
0.1	Strongly Perceptible	Fragile buildings	-
0.12	-	-	Buildings extremely susceptible to vibration damage
0.2	-	-	Non-engineered timber and masonry buildings
0.25	-	Historic and some old buildings	-
0.3	-	Older residential structures	Engineered concrete and masonry (no plaster)
0.4	Severe	-	-
0.5	-	New residential structures, Modern industrial/commercial buildings	Reinforced-concrete, steel, or timber (no plaster)
PPV = peak particle velocity; in/sec = inches per second; FTA = Federal Transit Administration			
Source: California Department of Transportation, Transportation and Construction Vibration Guidance Manual, 2020 and Federal Transit Administration; Transit Noise and Vibration Assessment Manual, 2018.			

[1] Federal Interagency Committee on Noise, *Federal Agency Review of Selected Airport Noise Analysis Issues*, August 1992.

Ground vibration can be a concern in instances where buildings shake, and substantial rumblings occur. However, it is unusual for vibration from typical urban sources such as buses and heavy trucks to be perceptible. Common sources for groundborne vibration are planes, trains, and construction activities such as earth-moving which requires the use of heavy-duty earth moving equipment. For the purposes of this analysis, a PPV descriptor with units of inches per second (in/sec) is used to evaluate construction-generated vibration for building damage and human complaints.

3 REGULATORY SETTING

To limit population exposure to physically or psychologically damaging as well as intrusive noise levels, the Federal government, the State of California, various county governments, and most municipalities in the state have established standards and ordinances to control noise.

3.1 STATE OF CALIFORNIA

California Government Code

California Government Code Section 65302(f) mandates that the legislative body of each county and city adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines established 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” noise levels for various land use types. Single-family homes are “normally acceptable” in exterior noise environments up to 60 CNEL and “conditionally acceptable” up to 70 CNEL. Multiple-family residential uses are “normally acceptable” up to 65 CNEL and “conditionally acceptable” up to 70 CNEL. Schools, libraries, and churches are “normally acceptable” up to 70 CNEL, as are office buildings and business, commercial, and professional uses.

Title 24 – Building Code

The State’s noise insulation standards are codified in the California Code of Regulations, Title 24: Part 1, Building Standards Administrative Code, and Part 2, California Building Code. These noise standards are applied to new construction in California for interior noise compatibility from exterior noise sources. The regulations specify that acoustical studies must be prepared when noise-sensitive structures, such as residential buildings, schools, or hospitals, are located near major transportation noise sources, and where such noise sources create an exterior noise level of 65 dBA CNEL or higher. Acoustical studies that accompany building plans must demonstrate that the structure has been designed to limit interior noise in habitable rooms to acceptable noise levels. For new multi-family residential buildings, the acceptable interior noise limit for new construction is 45 dBA CNEL.

3.2 LOCAL

City of San José General Plan

The San José General Plan identifies goals, policies, and implementations in the Noise Element. The Noise Element provides a basis for comprehensive local programs to regulate environmental noise and protect citizens from excessive exposure. Table 4: Land-Use Compatibility Guidelines for Community Noise in San José highlights five land-use categories and the outdoor noise compatibility guidelines.

Table 4: Land-Use Compatibility Guidelines for Community Noise in San José

Land-Use Category	Exterior Noise Exposure (DNL), in dBA		
	Normally Acceptable[1]	Conditionally Acceptable[2]	Normally Unacceptable[3]
Residential, Hotels and Motels, Hospitals, and Residential Care	Up to 60	>60 to 75	>75
Outdoor Sports and Recreation, Neighborhood Parks and Playgrounds	Up to 65	>65 to 80	>80
Schools, Libraries, Museums, Meeting Halls, Churches	Up to 60	>60 to 75	>75
Office Buildings, Business Commercial, and Professional Offices	Up to 70	>70 to 80	>75
Sports Area, Outdoor Spectator Sports	Up to 70	>70 to 80	>65
Public and Quasi-Public Auditoriums, Concert Halls, Amphitheaters		>55 to 70	>70

1. Normally Acceptable – Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction. There are no special noise insulation requirements.
2. Conditionally Acceptable – New construction should be undertaken only after a detailed analysis of the noise reduction requirement is conducted and needed noise insulation features included in the design.
3. Normally Unacceptable – New construction should be discouraged and may be denied as inconsistent with the General Plan and City Code. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
4. Outdoor open space noise standards do not apply to private balconies/patios.

Source: City of San José General Plan, 2014.

The San José General Plan includes the following policies for noise:

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

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

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

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 – 1.13: Update noise limits and acoustical descriptors in the Zoning Code to clarify noise standards that apply to land uses throughout the City.

Policy EC – 1.14: Require acoustical analyses for proposed sensitive land uses in areas with exterior noise levels exceeding the City's noise and land use compatibility standards to base noise attenuation techniques on expected Envision General Plan traffic volumes to ensure land use compatibility and General Plan consistency.

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

City of San José Municipal Code

According to San José Municipal Code, Section 20.100.450, construction hours within 500 feet of a residential unit are limited to the hours of 7:00 a.m. to 7:00 p.m. on Monday through Friday, unless otherwise allowed in a Development Permit or other planning approval. The Municipal Code does not establish quantitative noise limits for construction activities in the City. Table 5: City of San José Zoning Ordinance Noise Standards shows the San José standards for maximum noise level at the property line.

Table 5: City of San José Zoning Ordinance Noise Standards

Land Use Types	Maximum Noise Level in Decibels at Property Line
Industrial use adjacent to a property used or zoned for residential purposes	55
Industrial use adjacent to a property used or zoned for commercial purposes	60
Industrial use adjacent to a property used or zoned for industrial or use other than commercial or residential purposes	70
Source: City of San José Municipal Code section 20.50.300.	

4 EXISTING CONDITIONS

4.1 EXISTING NOISE SOURCES

The City of San José (including the project site) is impacted by various noise sources. Mobile sources of noise, especially cars and trucks, are the most common and significant sources of noise in most communities. Other sources of noise are the various land uses (i.e., residential, commercial, institutional, and recreational and parks activities) throughout the City that generate stationary-source noise.

Noise Measurements

To determine ambient noise levels in the project area, four short-term (10-minute) noise measurements and one long-term (24-hour) noise measurement were taken using a Larson Davis SoundExpert LxT Type I integrating sound level meter on March 22 through March 24, 2022; refer to Appendix A for existing noise measurement data.

As shown in Figure 4: Noise Measurement Locations, short-term measurement 1 (ST-1) was taken to represent the ambient noise level at the industrial uses east of the project site on Piercy Road, ST-2 was taken to represent existing noise levels at the residential uses to the south of the project site, ST-3 was taken to represent the existing noise level at the industrial uses to the west, and ST-4 was taken to represent the existing noise level at the residential uses to the northeast. Long-term measurement 1 (LT-1) was taken to represent existing ambient noise levels at the project site. The primary noise sources during the noise measurements were traffic along Piercy Road, Hellyer Avenue, and stationary noise at commercial and industrial operations nearby. Table 6: Noise Measurements provides the ambient noise levels measured at these locations.

Table 6: Noise Measurements

Site No.	Location	L_{eq} (dBA)	L_{min} (dBA)	L_{max} (dBA)	L_{peak} (dBA)	Time	Date
ST-1	474 Piercy Road	57.0	41.6	75.0	92.6	10:10 a.m. to 10:20 a.m.	3/22/2022
ST-2	363 Piercy Road	60.0	43.9	75.3	90.1	10:50 a.m. to 11:00 a.m.	3/22/2022
ST-3	5890 Silver Creek Valley Road	59.3	52.0	68.5	84.6	11:05 a.m. to 11:15 a.m.	3/22/2022
ST-4	475 Piercy Road	56.8	39.7	74.7	87.5	10:25 a.m. to 10:35 a.m.	3/22/2022
LT-1	Project Site	55.7	42.5	82.5	101.9	11:54 a.m. to 12:04 p.m.	3/23/2022 – 3/24/2022
Source: Noise Measurements taken by Kimley-Horn on March 22nd through 24th, 2022.							

Source: Nearmap, 2022

Figure 4: Noise Measurement Locations

469 Piercy Road Project
Initial Study

Not to scale

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Existing Mobile Noise

Existing roadway noise levels were calculated for the roadway segments in the project vicinity. This task was accomplished using the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108) and existing traffic volumes from the Project Transportation Analysis (Kimley-Horn 2022). The noise prediction model calculates the average noise level at specific locations based on traffic volumes, average speeds, roadway geometry, and site environmental conditions. The average vehicle noise rates (also referred to as energy rates) used in the FHWA model have been modified to reflect average vehicle noise rates identified for California by Caltrans. The Caltrans data indicates that California automobile noise is 0.8 to 1.0 dBA higher than national levels and that medium and heavy truck noise is 0.3 to 3.0 dBA lower than national levels. The average daily noise levels along roadway segments in proximity to the project site are included in Table 7: Existing Traffic Noise.

Table 7: Existing Traffic Noise

Roadway Segment	ADT	dBA DNL[1]
Piercy Road		
East of Hellyer Avenue	1,470	50.5
Silver Creek Valley Road		
West of Piercy Road	20,350	65.4
Hellyer Avenue		
North of Piercy Road	7,150	60.7
South of Piercy Road	7,700	60.9
ADT = average daily trips; dBA = A-weighted decibels; DNL = day-night noise level		
1. Traffic noise levels are at 100 feet from the roadway centerline. The actual sound level at any receptor location is dependent upon such factors as the source-to-receptor distance and the presence of intervening structures, barriers, and topography.		
Source: Based on data from the Transportation Analysis (Kimley-Horn, 2022). Refer to Appendix A for traffic noise modeling assumptions and results.		

The project site is primarily surrounded by industrial and commercial uses. The existing mobile noise in the project area are generated along Piercy Road, which is east of the project site, and Hellyer Avenue which is south of the project site.

Existing Stationary Noise

The primary sources of stationary noise in the project vicinity are those associated with the operations of nearby existing commercial and industrial surrounding of the project site. The noise associated with these sources may represent a single-event noise occurrence, short-term noise, or long-term/continuous noise.

4.2 SENSITIVE RECEPTORS

Noise exposure standards and guidelines for various types of land uses reflect the varying noise sensitivities associated with each of these uses. Residences, hospitals, schools, guest lodging, libraries, and churches are treated as the most sensitive to noise intrusion and therefore have more stringent noise exposure targets than do other uses, such as manufacturing or agricultural uses that are not subject to impacts such as sleep disturbance.

As shown in Table 8: Sensitive Receptors, sensitive receptors near the project site include single-family residences and a church, refer to Figure 5: Sensitive Receptor Locations. These distances are from the project site to the sensitive receptor property line.

Table 8: Sensitive Receptors

Receptor Description	Distance and Direction from the Project Site[1]
1. Single-family residence	150 feet southwest
2. Single-family residence	560 feet east
3. Family Community Church/Mar Thoma Church of Silicon Valley/RCCG – Jesus House Silicon Valley	150 feet east
Notes: 1. Distances are measured from the project site boundary to the property line.	

Source: Nearmap, 2022

Figure 5: Sensitive Receptors

469 Piercy Road Project
Initial Study

Not to scale

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5 SIGNIFICANCE CRITERIA AND METHODOLOGY

5.1 CEQA THRESHOLDS

Appendix G of the California Environmental Quality Act (CEQA) Guidelines contains analysis guidelines related to noise impacts. These guidelines have been used by the City to develop thresholds of significance for this analysis. A project would create a significant environmental impact if it would:

NOI-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;

NOI-2 Generate excessive groundborne vibration or groundborne noise levels; and

NOI-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.

5.2 METHODOLOGY

Construction

Construction noise estimates are based upon noise levels on typical noise levels generated by construction equipment published by the Federal Transit Administration (FTA) and FHWA. Construction noise is assessed in dBA L_{eq}. This unit is appropriate because L_{eq} can be used to describe noise level from operation of each piece of equipment separately, and levels can be combined to represent the noise level from all equipment operating during a given period. The Federal Transit Administration's (FTA) *Transit Noise and Vibration Impact Assessment Manual* (2018) (FTA Noise and Vibration Manual) identifies a maximum 8-hour noise level standard of 80 dBA L_{eq} at residential uses and 90 dBA L_{eq} at commercial and industrial uses for short-term construction activities.

Reference noise levels are used to estimate noise levels at nearby sensitive receptors based on a standard noise attenuation rate of 6 dB per doubling of distance (line-of-sight method of sound attenuation for point sources of noise). Construction noise level estimates do not account for the presence of intervening structures or topography, which may reduce noise levels at receptor locations. Therefore, the noise levels presented herein represent a conservative, reasonable worst-case estimate of actual temporary construction noise.

Operations

The analysis of the existing and future noise environments is based on noise prediction modeling and empirical observations. Reference noise level data are used to estimate the project operational noise impacts from stationary sources. Noise levels are collected from field noise measurements and other published sources from similar types of activities are used to estimate noise levels expected with the project's stationary sources. The reference noise levels are used to represent a worst-case noise environment as noise level from stationary sources can vary throughout the day.

Stationary source operational noise is evaluated based on the standards within the City's Municipal Code. The traffic noise levels in the project vicinity were calculated using the FHWA Highway Noise Prediction Model (FHWA-RD-77-108).

Vibration

Groundborne vibration levels associated with construction-related activities for the project were evaluated utilizing typical groundborne vibration levels associated with construction equipment, obtained from FTA published data for construction equipment. Potential groundborne vibration impacts related to structural damage and human annoyance were evaluated, considering the distance from construction activities to nearby land uses and typically applied criteria for structural damage and human annoyance.

6 POTENTIAL IMPACTS AND MITIGATION

6.1 ACOUSTICAL IMPACTS

Threshold 6.1 Would the Project 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?

Construction

Construction noise typically occurs intermittently and varies depending on the nature or phase of construction (e.g. land clearing, grading, excavation, paving). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. During construction, exterior noise levels could affect the residential neighborhoods surrounding the construction site. Project construction would occur approximately 150 feet from the nearest sensitive receptor, the single-family residences, to the southwest. However, construction activities would occur throughout the project site and would not be concentrated at a single point near sensitive receptors. Noise levels typically attenuate (or drop off) at a rate of 6 dB per doubling of distance from point sources, such as industrial machinery. During construction, exterior noise levels could affect the residential neighborhoods near the construction site.

Construction activities associated with development of the project would include demolition, site preparation, grading, paving, building construction, and architectural coating. Such activities may require dozers and tractors during site preparation; graders, dozers, and tractors during grading; cranes, forklifts, generators, tractors, and welders during building construction; pavers, rollers, mixers, tractors, and paving equipment during paving; and air compressors during architectural coating. Grading and excavation phases of project construction tend to be the shortest in duration and create the highest construction noise levels due to the operation of heavy equipment required to complete these activities. It should be noted that only a limited amount of equipment can operate near a given location at a particular time. Equipment typically used during the grading and excavation stage includes heavy-duty trucks, backhoes, bulldozers, excavators, front-end loaders, and scrapers. Operating cycles for these types of construction equipment may involve one or two minutes of full-power operation followed by three to four minutes at lower power settings. Other primary sources of noise would be shorter-duration incidents, such as placing large pieces of equipment or the hydraulic movement of machinery lifts, which would last less than one minute. According to the applicant, no pile-driving would be required during construction and as such a project condition of approval will be included in the project permit to reflect the project's proposed construction.

Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. Typical noise levels associated with individual construction equipment are listed in. Table 9: Typical Construction Noise Levels.

Table 9: Typical Construction Noise Levels

Equipment	Typical Noise Level (dBA) at 50 feet from Source
Air Compressor	80
Backhoe	80
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Derrick	88
Crane, Mobile	83
Dozer	85
Generator	82
Grader	85
Impact Wrench	85
Jack Hammer	88
Loader	80
Paver	85
Pump	77
Roller	85
Saw	76
Scraper	85
Shovel	82
Truck	84
Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.	

The City of San José does not have construction noise standards. As shown in Table 9 noise maximum levels are below 88 dBA at 50 feet. The highest anticipated construction noise level of 88 dBA at 50 feet is expected to occur during the demolition phase. Noise impacts for mobile construction equipment are typically assessed as emanating from the center of the equipment activity or construction site.[2] For the proposed project, this center point would be approximately 420 feet from the nearest sensitive receptor, the single-family residences. These sensitive uses may be exposed to elevated noise levels during project construction. The Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM) was used to calculate noise levels during construction activities; refer to Appendix A: Noise Data. RCNM is a computer program used to assess construction noise impacts and allows for user-defined construction equipment and user-defined noise limit criteria. Noise levels were calculated for each construction phase and are based on the equipment used, distance to the nearest property/receptor, and acoustical use factor for equipment.

The noise levels calculated in Table 10: Project Construction Noise Levels, show estimated exterior construction noise at the closest receptors. Based on calculations using the RCNM model, construction noise levels would range from approximately 47.8 dBA L_{eq} and 68.1 dBA L_{eq} at the nearest sensitive receptors and nearest off-site uses; see Table 10.

[2] For the purposes of this analysis, the construction area is defined as the center of the project site per the methodology in the FTA Transit Noise and Vibration Impact Assessment Manual (September 2018). Although some construction activities may occur at distances closer than 420 feet from the nearest properties, construction equipment would be dispersed throughout the project site during various construction activities. Therefore, the center of the project site represents the most appropriate distance based on the sporadic nature of construction activities.

Table 10: Project Construction Noise Levels

Construction Phase	Receptor Location			Modeled Exterior Noise Level (dBA L_{eq}) [2]	Noise Threshold (dBA L_{eq}) [3]	Exceeded?
	Land Use	Direction	Distance (feet) [1]			
Demolition	Single Family Residential	Southwest	420	66.1	80	No
	Single Family Residential	West	990	58.7		No
	Industrial	West	360	67.4	90	No
Site Preparation	Single Family Residential	Southwest	420	63.5	80	No
	Single Family Residential	West	990	56.1		No
	Industrial	West	360	64.9	90	No
Grading	Single Family Residential	Southwest	420	66.7	80	No
	Single Family Residential	West	990	59.3		No
	Industrial	West	360	68.1	90	No
Building Construction	Single Family Residential	Southwest	420	63.9	80	No
	Single Family Residential	West	990	56.5		No
	Industrial	West	360	65.3	90	No
Paving	Single Family Residential	Southwest	420	58.2	80	No
	Single Family Residential	West	990	50.7		No
	Industrial	West	360	59.5	90	No
Architectural Coating	Single Family Residential	Southwest	420	55.2	80	No
	Single Family Residential	West	990	47.8		No
	Industrial	West	360	56.5	90	No

Notes:
1. Distance is from the nearest receptor to the main construction activity area on the project site. Not all equipment would operate at the closest distance to the receptor.
2. Modeled noise levels conservatively assume the simultaneous operation of all pieces of equipment.
3. The FTA Noise and Vibration Manual establishes construction noise standards of 80 dBA $L_{eq(8\text{-}hour)}$ for residential uses and 90 dBA $L_{eq(8\text{-}hour)}$ for commercial and industrial uses.

Source: Federal Highway Administration, *Roadway Construction Noise Model,* 2006. Refer to **Appendix A: Noise Data** for noise modeling results.

As shown in Table 10, the loudest noise levels would be 66.7 dBA L_{eq} at the nearest sensitive receptor and 68.1 dBA L_{eq} at the nearest industrial uses, which would not exceed the FTA's construction noise standards of 80 dBA L_{eq} and/or 90 dBA L_{eq}. In addition, all construction equipment would be equipped with functioning mufflers as mandated by the State and project construction would comply with Section 20.100.450 of the municipal code, limiting construction hours within 500 feet of a residential unit to the hours of 7:00 a.m. to 7:00 p.m. on Monday through Friday.

General Policy EC-1.7 requires construction operations within San José to use best available noise suppression devices and techniques and limit construction hours near residential uses. 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.

The project site is located within 500 feet of residential uses, as well as 200 feet from industrial uses south, west, and east of the site. The proposed project construction would result in approximately six months of substantial noise generating activities, including phases such as demolition, grading and building framing as well as seven months of less noise intensive construction phases such as site preparation, building construction, paving, and architectural coating. These phases are considered less noise intensive since they do not include as much heavy equipment, as compared to grading and building framing, and most activities, such as building finishes involve mostly hand tools. Additionally, the project would not include pile-driving. Therefore, the proposed project would not result in more than 12 months of substantial noise generating activities.

Additionally, construction activities would be limited to daytime hours when people would be out of their houses and would conform to the time-of-day restrictions of the City's Municipal Code. The proposed project would be required to adhere to the Standard Permit Conditions which would ensure that all construction equipment is equipped with properly operating and maintained mufflers and other state required noise attenuation devices, helping to reduce noise at the source. Further, the Standard Permit Conditions are required to ensure that construction noise levels do not exceed the City's standards and that time-of-day restrictions are adhered to. With implementation of these conditions, construction noise impacts to nearby receptors would be less than significant.

Construction Traffic Noise

Construction is estimated to be approximately 13 months. Construction noise may be generated by large trucks moving materials to and from the project site. Large trucks would be necessary to deliver building materials as well as remove dump materials. Based on the California Emissions Estimator Model (CalEEMod) default assumptions for this project, as analyzed in 469 Piercy Road Project Air Quality Assessment (Kimley-Horn, 2023), the project would generate the highest number of daily trips during the building construction and grading phases. The model estimates that the project would generate approximately 15 daily worker trips during grading. Building construction would have 98 worker trips and 38 daily vendor trips. Because of the logarithmic nature of noise levels, a doubling of the traffic volume (assuming that the speed and vehicle mix do not also change) would result in a noise level increase of 3 dBA. Hellyer Avenue, south of Piercy Road, has an average daily trip volume of 8,140 vehicles (Table 7). Therefore, a maximum of 151 daily project construction trips (total of 113 daily worker trips and 38 daily vendor trips) would not double the existing traffic volume per day. Construction related traffic noise would not be noticeable and would not create a significant noise impact. Further, while construction is approximately 13 months and is would be temporary, the project would be subject to the following standard permit conditions to limit construction noise and impacts.

Standard Permit Conditions

Construction-Related Noise. Noise minimization measures include, but are not limited to, the following:

i. Prohibit pile driving.

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

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

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

v. Prohibit unnecessary idling of internal combustion engines.

vi. 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.

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

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

ix. 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.

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

xi. 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.

Operations

Implementation of the project would create new sources of noise in the project vicinity. The major noise sources associated with the project that would potentially impact existing and future nearby residences include the following:

- Off-site traffic noise;
- Mechanical equipment (i.e., trash compactors, air conditioners, etc.);
- Delivery trucks on the project site, and approaching and leaving the loading areas;
- Activities at the loading areas (i.e., maneuvering and idling trucks, loading/unloading, and equipment noise);
- Parking areas (i.e., car door slamming, car radios, engine start-up, and car pass-by); and
- Landscape maintenance activities.

As discussed above, the closest sensitive receptors are located approximately 150 feet to the southwest of the project site. The City of San José stationary source exterior Zoning Ordinance Noise Standards for industrial areas adjacent to a property used for residential purposes uses is 55 dBA L_{eq}. Per General Plan Policy EC-1.1, land use compatibility standard for business, commercial and industrial areas is up to 70 dBA DNL (DNL).

Off-Site Traffic Noise

Implementation of the project would generate increased traffic volumes along study roadway segments. The project is expected to generate a net of 213 average daily trips, which would result in noise increases on project area roadways. In general, a traffic noise increase of less than 3 dBA is barely perceptible to people, while a 5-dBA increase is readily noticeable (Caltrans, 2013). Generally, traffic volumes on project area roadways would have to approximately double for the resulting traffic noise levels to increase by 3 dBA. Therefore, permanent increases in ambient noise levels of less than 3 dBA are considered to be less than significant.

As shown in Table 11: Existing and Project Traffic Noise, the existing traffic-generated noise level on project area roadways is between 50.5 dBA L_{dn} and 65.4 dBA L_{dn} at 100 feet from the centerline. As previously described, L_{dn} is 24-hour average noise level with a 10 dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively.

Traffic noise levels for roadways primarily affected by the project were calculated using the FHWA's Highway Noise Prediction Model (FHWA-RD-77-108). Traffic noise modeling was conducted for conditions with and without the project, based on traffic volumes (Kimley-Horn, 2022). As noted in Table 11, project noise levels 100 feet from the centerline would range from 52.1 dBA to 65.4 dBA. The project would have the highest increase of 1.6 dBA on Piercy Road. However, the 1.6 dBA DNL increase is under the perceptible 3.0 dBA noise level increase per General Plan EC – 1.1. Therefore, the project would not have a significant impact on existing traffic noise levels.

Table 11: Existing and Project Traffic Noise

Roadway Segment	Existing Conditions		With Project		Change from No Project Conditions	Significant Impact?
	ADT	dBA DNL[1]	ADT	dBA DNL[1]		
Piercy Road						
East of Hellyer Avenue	1,470	50.5	1,610	52.1	1.6	**No**
Silver Creek Valley Road						
West of Piercy Road	20,350	65.4	20,563	65.4	0.0	**No**
Hellyer Avenue						
North of Piercy Road	7,150	60.7	7,230	60.9	0.2	**No**
South of Piercy Road	7,700	60.9	7,710	61.0	0.1	**No**

ADT = average daily trips; dBA = A-weighted decibels; DNL= day-night noise levels

1.Traffic noise levels are at 100 feet from the roadway centerline. The actual sound level at any receptor location is dependent upon such factors as the source-to-receptor distance and the presence of intervening structures, barriers, and topography.

Source: Based on data from the Transportation Analysis (Kimley-Horn, 2023). Refer to Appendix A for traffic noise modeling assumptions and results.

Table 12: Background Year and Background Year Plus Project Traffic Noise, shows the background conditions or Background Year traffic. Per the Transportation Analysis, Background Year conditions include 12 approved projects that were added to the existing 2022 volumes. As shown in Table 12, Background Year roadway noise levels with the project would range from 51.8 dBA to 67.8 dBA. The project would have the highest increase of 1.2 dBA on Piercy Road, east of Hellyer Avenue. However, the 1.2 dBA DNL increase is under the perceptible 3.0 dBA noise level increase per General Plan EC – 1.1.

Additionally, project traffic would traverse and disperse over project area roadways, where existing ambient noise levels already exist. Future development associated with the project would result in additional traffic on adjacent roadways, thereby increasing vehicular noise near existing and proposed land uses. However, the project would not result in noise level increases above 3.0 dBA and wouldn't exceed the City's 3.0 dBA noise level increase per General Plan EC – 1.1. Therefore, impacts are less than significant.

Table 12: Background Year and Background Year Plus Project Traffic Noise

Roadway Segment	Opening Year		With Project		Change from No Project Conditions	Significant Impact?
	ADT	dBA DNL[1]	ADT	dBA DNL[1]		
Piercy Road						
East of Hellyer Avenue	1,950	51.8	2,090	53.0	1.2	**No**
Silver Creek Valley Road						
West of Piercy Road	35,220	67.8	35,433	67.8	0.0	**No**
Hellyer Avenue						
North of Piercy Road	9,590	62.0	9,670	62.1	0.2	**No**
South of Piercy Road	11,510	62.6	11,520	62.8	0.2	**No**
ADT = average daily trips; dBA = A-weighted decibels; DNL= day-night noise levels						
1.Traffic noise levels are at 100 feet from the roadway centerline. The actual sound level at any receptor location is dependent upon such factors as the source-to-receptor distance and the presence of intervening structures, barriers, and topography.						
Source: Based on data from the Transportation Analysis (Kimley-Horn, 2023). Refer to Appendix A for traffic noise modeling assumptions and results.						

Stationary Noise Sources

Implementation of the project would create new sources of noise in the project vicinity from mechanical equipment, truck loading areas, parking lot noise, and landscape maintenance. Table 13: Stationary Source Noise Levels shows the noise levels generated by various stationary noise sources and the resulting noise level at the nearest receiver. [3] Table 13 also show the project's compliance with GP Policy EC-1.1 and EC-1.2 as well as the Municipal Code. Each stationary source is discussed below.

Mechanical Equipment

Regarding mechanical equipment, the project would generate stationary-source noise associated with heating, ventilation, and air conditioning (HVAC) units. HVAC units typically generate noise levels of approximately 52 dBA at 50 feet. The closest sensitive receptors to the HVAC units would be the residential area 420 feet southwest of the project site. At this distance, noise levels would be 34 dBA and would be below the City's noise thresholds. The receptor would also not experience an incremental increase in their ambient noise levels. Table 13 shows that mechanical equipment would not exceed the City's General Plan standards in Policy EC-1.1 and Policy EC-1.2. Therefore, mechanical equipment would produce noise levels that are less than significant.

Loading Area Noise

The project is an industrial development that would include deliveries. The primary noise associated with deliveries is the arrival and departure of trucks. Operations of proposed project would potentially require a mixture of deliveries from vans, light trucks, and heavy-duty trucks. Normal deliveries typically occur

[3] Distances are measured from the project site to the property line of the nearest receiver.

during daytime hours. During loading and unloading activities, noise would be generated by the trucks' diesel engines, exhaust systems, and brakes during low gear shifting' braking activities; backing up toward the docks/loading areas; dropping down the dock ramps; and maneuvering away from the docks. The project is surrounded by industrial uses to the east, west, and south. The closest that the proposed loading area would be located to sensitive receptors would be approximately 510 feet southwest from the project site. While there would be temporary noise increases during truck maneuvering and engine idling, these impacts would be of short duration and infrequent. Additionally, loading noise levels would be further attenuated by intervening structures. Table 13 shows that truck and loading area noise would not exceed the City's General Plan standards in Policy EC-1.1 and Policy EC-1.2. Typically, heavy truck operations generate a noise level of 64 dBA at a distance of 50 feet. At the nearest residential receptors, noise levels would be 44 dBA which is below the 55 dBA noise standard. At the nearest industrial receptor, noise levels would be 51 dBA which is also below the 70 dBA noise standard. Both receptors would also experience an incremental noise increase of 0.1 dBA which is below Policy EC-1.2 standards. Therefore, loading areas would produce levels that are less than significant.

Parking Areas

Traffic associated with parking areas is typically not of sufficient volume to exceed community noise standards, which are based on a time-averaged scale such as the CNEL scale. However, the instantaneous maximum sound levels generated by a car door slamming, engine starting up and car pass-bys may be an annoyance to adjacent noise-sensitive receptors. Parking lot noise can also be considered a "stationary" noise source. The instantaneous maximum sound levels generated by a car door slamming, engine starting up, and car pass-bys range from 53 to 61 dBA at 50 feet and may be an annoyance to noise-sensitive receptors. Conversations in parking areas may also be an annoyance to sensitive receptors. Sound levels of speech typically range from 33 dBA at 48 feet for normal speech to 50 dBA at 50 feet for very loud speech. It should be noted that parking lot noise are instantaneous noise levels compared to noise standards in the DNL scale, which are averaged over time. As a result, actual noise levels over time resulting from parking lot activities would be far lower. The nearest residential property line would be located approximately 225 feet away from the project's parking areas. As Table 13 shows, noise generated from the parking lot would be at 48 dBA at 225 feet which would not exceed the City's General Plan standards in Policy EC-1.1 and Policy EC-1.2.

Landscape Maintenance Activities

Development and operation of the project includes new landscaping that would require periodic maintenance. Noise generated by a gasoline-powered lawnmower is estimated to be approximately 70 dBA at a distance of five feet. Landscape Maintenance activities would be 61 dBA at 50 feet away. Maintenance activities would operate during daytime hours for brief periods of time as allowed by the City Municipal Code and would not permanently increase ambient noise levels in the project vicinity and would be consistent with activities that currently occur at the surrounding uses. Table 13 shows that landscape maintenance noise would not exceed the City's General Plan standards in Policy EC-1.1 and Policy EC-1.2.

Table 13: Stationary Source Noise Levels

Nearest Land Use	Distance (feet)[1]	Reference Level at 50 ft (dBA)	Policy EC-1.1			Policy EC-1.2			
			Noise Level at Receiver	Exterior Noise Standard	Exceed Threshold	Ambient Noise Level (L_{eq})	Combined Noise at Receiver	Incremental Increase (dBA)[10]	Exceed Threshold[9]
Mechanical Equipment									
Residence (southwest)	420	52 dBA[2]	34 dBA	55 dBA[5]	No	60.0 dBA[7]	60.0 dBA	0.0	No
Residences (east)	880		27 dBA		No	56.8 dBA[8]	56.8 dBA	0.0	No
Industrial	245		38 dBA	70 dBA[6]	No	67.4 dBA[9]	67.4 dBA	0.0	N/A
Loading Area									
Residence (southwest)	510	64 dBA[2]	44 dBA	55 dBA[5]	No	60.0 dBA[7]	60.1 dBA	0.1	No
Residences (east)	870		39 dBA		No	56.8 dBA[8]	56.9 dBA	0.1	No
Industrial	230		51 dBA	70 dBA[6]	No	67.4 dBA[9]	67.5 dBA	0.1	N/A
Parking Area									
Residence (southwest)	225	61 dBA[3]	48 dBA	55 dBA[5]	No	60.0 dBA[7]	60.3 dBA	0.3	No
Residences (east)	730		38 dBA		No	56.8 dBA[8]	56.9 dBA	0.1	No
Industrial	110		54 dBA	70 dBA[6]	No	67.4 dBA[9]	67.6 dBA	0.2	N/A
Landscape Maintenance									
Residence (southwest)	215	61 dBA[4]	37 dBA	55 dBA[5]	No	60.0 dBA[7]	60.0 dBA	0.0	No
Residences (east)	720		27 dBA		No	56.8 dBA[8]	57.0 dBA	0.0	No
Industrial	100		44 dBA	70 dBA[6]	No	67.4 dBA[9]	67.4 dBA	0.0	N/A

1. The distance is from the location of the operational noise source to the sensitive receptor property line.
2. Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, July 6, 2010.
3. Kariel, H. G., *Noise in Rural Recreational Environments*, Canadian Acoustics 19(5), 3-10, 1991.
4. U.S. EPA, *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances*, 1971.
5. City of San José Municipal Code section 20.50.300 (Table 20-135), which establishes industrial use noise standards of 55 dBA when adjacent to residential zones, 60 dBA when adjacent to commercial zones, and 70 dBA when adjacent to industrial zones or use other than commercial or residential purposes.
6. City of San José General Plan Policy EC-1.1 establishes Normally acceptable noise standards of 65 dBA for residential and recreational uses and 70 dBA for commercial office uses.
7. Noise Measurement ST-2, which is representative of ambient noise levels at the residential uses to the south of the project site.
8. Noise Measurement ST-4, which is representative of ambient noise levels at the residential uses to the northeast of the project site.
9. Noise Measurement ST-1, which is representative of ambient noise levels at the industrial uses to the east of the project site.
10. Incremental noise threshold per City of San José General Plan Policy EC-1.2, which establishes incremental noise standards of 5 dBA where noise levels would remain "Normally Acceptable" and 3 dBA where noise levels would equal or exceed the "Normally Acceptable" level for land uses sensitive to increased noise levels. Normally acceptable levels are 65 dBA for residential uses. Although the normally acceptable standard for industrial and commercial office uses is 70 dBA, it is not considered a land use sensitive to increased noise levels per Policy EC-1.2.

As shown in Table 13, stationary sources would not exceed the Land Use Compatibility Standards from GP Policy EC-1.1 or the incremental noise increases per GP Policy EC-1.2 at the adjacent industrial use or nearest residential use. Additionally, noise levels would be further attenuated by intervening terrain and structures. Impacts from mechanical equipment, loading area, parking area, and landscape maintenance would be less than significant. Therefore, the project would not result in a significant impact to operational noise.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

Threshold 6.2 Would the Project generate excessive groundborne vibration or groundborne noise levels?

Construction

Increases in groundborne vibration levels attributable to the project would be primarily associated with construction-related activities. Construction on the project site would have the potential to result in varying degrees of temporary groundborne vibration, depending on the specific construction equipment used and the operations involved. Ground vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. The effect on buildings located in the vicinity of the construction site often varies depending on soil type, ground strata, and construction characteristics of the receiver building(s). The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibration at moderate levels, to slight damage at the highest levels. Groundborne vibrations from construction activities rarely reach levels that damage structures.

The FTA has published standard vibration velocities for construction equipment operations. In general, depending on the building category of the nearest buildings adjacent to the potential pile driving area, the potential construction vibration damage criteria vary. For example, for a building constructed with reinforced concrete with no plaster, the FTA guidelines show that a vibration level of up to 0.50 inch per second (in/sec) peak particle velocity (PPV) is considered safe and would not result in any construction vibration damage. The City of San José General Plan Policy EC-2.3 includes a vibration limit of 0.08 in/sec PPV for sensitive historic structures and 0.20 in/sec PPV for normal conventional construction. The surrounding structures are not listed as historical resources. Therefore, the 0.20 in/sec PPV threshold could be utilized.

Table 14: Typical Construction Equipment Vibration Levels, lists vibration levels at 25 feet and 150 feet for typical construction equipment. Groundborne vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. As indicated in Table 14, based on FTA data, vibration velocities from typical heavy construction equipment operations that would be used during project construction range from 0.003 to 0.089 in/sec PPV at 25 feet from the source of activity. Project construction would occur approximately 25 feet from the nearest off-site use, the industrial building located to the northwest, and approximately 150 feet from the nearest sensitive receptor located to the southwest. Therefore, the nearest sensitive receptor would not experience perceptible vibration levels.

Table 14: Typical Construction Equipment Vibration Levels

Equipment	Peak Particle Velocity At 25 feet (in/sec)	Peak Particle Velocity At 150 feet (in/sec)
Large Bulldozer	0.089	0.0061
Loaded Trucks	0.076	0.0052
Rock Breaker	0.059	0.0040
Jackhammer	0.035	0.0024
Small Bulldozer/Tractors	0.003	0.0004
1. Calculated using the following formula: PPVequip = PPVref x (25/D)1.5, where: PPVequip = the peak particle velocity in in/sec of the equipment adjusted for the distance; PPVref = the reference vibration level in in/sec from Table 7-4 of the Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, 2018; D = the distance from the equipment to the receiver.		
Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, September 2018.		

As shown in Table 14, the highest vibration levels are achieved with the large bulldozer operations. This construction activity is expected to take place during grading. As discussed above, project construction would occur approximately 25 feet from the closest structure. Therefore, construction equipment vibration velocities would not exceed the City's 0.20 PPV threshold. In general, other construction activities would occur throughout the project site and would not be concentrated at the point closest to the nearest structure. Therefore, vibration impacts associated with the project would be less than significant.

Operations

The project would not generate groundborne vibration that could be felt at surrounding uses. Project operations would not involve railroads or substantial heavy truck operations, and therefore would not result in vibration impacts at surrounding uses. As a result, impacts from vibration associated with project operation would be less than significant.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

Threshold 6.3 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, would the Project expose people residing or working in the Project area to excessive noise levels?

The nearest airport to the project site is the Reid-Hillview County Airport located approximately 5.2 miles north of the project site. The project site lies outside of the 65 dBA CNEL noise contours shown in the Reid-Hillview County Airport Master Plan report published in July 2006.[4] Although aircraft-related noise would occasionally be audible at the project site, noise from aircraft would not substantially increase ambient noise levels. Exterior noise levels resulting from aircraft would be compatible with the proposed project. By ensuring compliance with the City's normally acceptable noise level standards, interior noise levels would also be considered acceptable with aircraft noise. Therefore, the project would not expose people residing or working in the project area to excessive airport- or airstrip-related noise levels and impacts would be less than significant.

[4] City of San José Reid-Hillview County Airport Master Plan*,* July 2006.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

6.2 CUMULATIVE NOISE IMPACTS

Noise by definition is a localized phenomenon, and drastically reduces as distance from the source increases. Cumulative noise impacts involve development of the project in combination with ambient growth and other related development projects. As noise levels decrease as distance from the source increases, only projects in the nearby area could combine with the project to potentially result in cumulative noise impacts.

Cumulative Construction Noise

The project's construction activities, when properly mitigated, would not result in a substantial temporary increase in ambient noise levels. The City permits construction hours within 500 feet of a residential unit are limited to the hours of 7:00 a.m. to 7:00 p.m. on Monday through Friday, unless otherwise allowed in a Development Permit or other planning approval. The project would contribute to other proximate construction noise impacts if construction activities were conducted concurrently. However, based on the noise analysis above, the project's construction-related noise impacts would be less than significant following compliance with local regulations and City Standard Permit Conditions outlined in this study.

Per consultation with the City, there are three proposed warehouses located within a mile of the project site with one located along the northeast face of the project site. Construction at the adjacent proposed project is anticipated to overlap with construction schedule for the project. However, the construction phases that include the substantial noise generating activities (demolition and grading) would not overlap between the two projects. Furthermore, construction activities at other planned and approved projects would be required to take place during daytime hours, and the City and project applicants would be required to evaluate construction noise impacts and implement mitigation, if necessary, to minimize noise impacts. Each project would be required to comply with the applicable City of San José Municipal Code limitations on allowable hours of construction. Therefore, project construction would not contribute to cumulative impacts and impacts in this regard are not cumulatively considerable.

Cumulative Operational Noise

Cumulative noise impacts describe how much noise levels are projected to increase over existing conditions with the development of the project and other foreseeable projects. Cumulative noise impacts would occur primarily as a result of increased traffic on local roadways due to buildout of the project and other projects in the vicinity. However, noise from generators and other stationary sources could also generate cumulative noise levels.

<u>Stationary Noise</u>
As discussed above, impacts from the project's operations would be less than significant. Due to site distance, intervening land uses, and the fact that noise dissipates as it travels away from its source, noise impacts from on-site activities and other stationary sources would be limited to the project site and vicinity. As mentioned previously, there are three proposed warehouses located within a mile of the project site, with one located along the northeast face of the project site. Stationary noise generated from the adjacent industrial site would influence the stationary noise generated by the project. However, due to the distance between the project site's stationary noise sources and the closest sensitive receptors,

and the presence of noise attenuating structures, stationary noise would not reach levels that exceed the City's Land Use Compatibility Guidelines at sensitive receptors. Therefore, each project would comply with the applicable San José General Plan noise regulations and would maintain the generated stationary noise levels at an acceptable level for nearby uses. Thus, cumulative operational noise impacts from related projects, in conjunction with project-specific noise impacts, would not be cumulatively significant.

Traffic Noise

A project's contribution to a cumulative traffic noise increase would be considered significant when the combined effect exceeds perception level (i.e., auditory level increase) threshold. Cumulative increases in traffic noise levels were estimated by comparing the Existing Plus Project and Cumulative scenarios to existing conditions.

The following criteria is used to evaluate the combined effect of the cumulative noise increase.

- *Combined Effect*. The cumulative with project noise level ("Cumulative With Project") would cause a significant cumulative impact if a 3.0 dB increase over "Existing" conditions occurs and the resulting noise level exceeds the applicable exterior standard at a sensitive use. Although there may be a significant noise increase due to the project in combination with other related projects (combined effects), it must also be demonstrated that the project has an incremental effect. In other words, a significant portion of the noise increase must be due to the project.

The following criteria have been used to evaluate the incremental effect of the cumulative noise increase.

- *Incremental Effects*. The "Cumulative With Project" causes a 1.0 dBA increase in noise over the "Opening Year Without Project" noise level.

A significant impact would result only if both the combined and incremental effects criteria have been exceeded. Noise by definition is a localized phenomenon and reduces as distance from the source increases. Consequently, only the project and growth due to occur in the general area would contribute to cumulative noise impacts. Table 15: Cumulative Plus Project Conditions Predicted Traffic Noise Levels, identifies the traffic noise effects along roadway segments in the vicinity of the project site for "Existing," "Cumulative Without Project," and "Cumulative With Project," conditions, including incremental and net cumulative impacts.

Table 15: Cumulative Plus Project Conditions Predicted Traffic Noise Levels

Roadway Segment	Existing[1]	Cumulative Without Project[1]	Cumulative With Project[1]	Combined Effects	Incremental Effects	Cumulatively Significant Impact?
				dBA Difference: Existing and Cumulative With Project	dBA Difference: Cumulative Without and With Project	
Piercy Road						
East of Hellyer Avenue	50.5	52.5	53.5	2.9	1.0	**No**
Silver Creek Valley Road						
West of Piercy Road	65.4	67.8	67.8	2.4	0.0	**No**
Hellyer Avenue						
North of Piercy Road	60.7	62.0	62.2	1.5	0.2	**No**
South of Piercy Road	60.9	62.7	62.8	1.9	0.1	**No**
ADT = average daily trips; dBA = A-weighted decibels; DNL= day-night noise levels						
1. Traffic noise levels are at 100 feet from the roadway centerline. The actual sound level at any receptor location is dependent upon such factors as the source-to-receptor distance and the presence of intervening structures, barriers, and topography.						
Source: Based on data from the Transportation Analysis (Kimley-Horn, 2022). Refer to Appendix A for traffic noise modeling assumptions and results.						

First, it must be determined whether the "Cumulative With Project" increase above existing conditions (Combined Effects) is exceeded. As indicated in the Table 15, none of the roadway segments exceed the combined effects criterion of 3.0 dB increase. However, under the Incremental Effects criteria, cumulative noise impacts are defined by determining if the forecast ambient ("Cumulative Without Project") noise level is increased by 1 dB or more. As indicated above, the project does reach the Incremental Effects criteria of 1 dB on Piercy Road, east of Hellyer Road. However, a significant impact would result only if both the combined and incremental effects criteria have been exceeded.

Therefore, the project's cumulative noise contribution would be less than significant. Based on the significance criteria set forth in this Report, no roadway segments would result in significant impacts because they would not exceed the City's threshold for noise at nearby sensitive receptors. The project would not result in long-term mobile noise impacts based on project-generated traffic as well as cumulative and incremental noise levels. Therefore, the project, in combination with cumulative background traffic noise levels, would result in a less than significant cumulative impact. The project's contribution to noise levels would not be cumulatively considerable.

7 REFERENCES

1. California Department of Transportation, *California Vehicle Noise Emission Levels*, 1987.
2. California Department of Transportation, *Traffic Noise Analysis Protocol*, 2020.
3. California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, 2013.
4. California Department of Transportation, *Transportation and Construction-Induced Vibration Guidance Manual*, 2020.
5. City of San José, *Envision San José 2040 General Plan FEIR*, 2011.
6. City of San José, *Municipal Code*, 2019.
7. City of San José Norman Y. Mineta San Jose International Airport Master Plan Update, *Noise Assessment for the Master Plan Environmental Impact Report,* October 2019.
8. Cyril M. Harris, *Handbook of Noise Control*, Second Edition, 1979.
9. Cyril M. Harris, *Noise Control in Buildings – A Practical Guide for Architects and Engineers*, 1994.
10. Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden. *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, July 6, 2010.
11. Kariel, H. G., *Noise in Rural Recreational Environments*, Canadian Acoustics 19(5), 3-10, 1991.
12. Federal Highway Administration, *Roadway Construction Noise Model*, 2006.
13. Federal Highway Administration, Roadway *Construction Noise Model User's Guide Final Report*, 2006.
14. Federal Interagency Committee on Noise, *Federal Agency Review of Selected Airport Noise Analysis Issues*, 1992.
15. Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.
16. Kimley-Horn & Associates, *469 Piercy Road Project Transportation Analysis*, March 2023.
17. United States Environmental Protection Agency, *Protective Noise Levels (EPA 550/9-79-100)*, 1979.

Appendix A

Noise Data

Noise Measurement Field Data

Project:	469 Piercy Road	**Job Number:**	197532001
Site No.:	ST - 1	**Date:**	3/22/2022
Analyst:	Mia Berg	**Time:**	10:10 AM
Location:	474 Piercy Road		
Noise Sources:	Pedestrian conversations in nearby parking lot; Street traffic		
Comments:			

Results (dBA):

	Leq:	Lmin:	Lmax:	Peak:
Measurement 1:	57.0	41.6	75.0	92.6

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	69°
Wind (mph):	6
Sky:	Clear
Bar. Pressure:	30.16"
Humidity:	49%

Photo:

Kimley»Horn

Measurement Report

Report Summary

Meter's File Name	LxT_Data.123.s	Computer's File Name	LxTse_0006073-20220322 090758-LxT_Data.123.ldbin
Meter	LxT SE 0006073		
Firmware	2.404		
User		Location	
Job Description			
Note			

Start Time	2022-03-22 09:07:58	Duration	0:10:00.0		
End Time	2022-03-22 09:17:58	Run Time	0:10:00.0	Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	57.0 dB		
LAE	84.8 dB	SEA	--- dB
EA	33.4 µPa²h		
LA_{peak}	92.6 dB	2022-03-22 09:12:45	
LAS_{max}	75.0 dB	2022-03-22 09:14:57	
LAS_{min}	41.6 dB	2022-03-22 09:13:33	
LA_{eq}	57.0 dB		
LC_{eq}	68.2 dB	LC_{eq} - LA_{eq}	11.2 dB
LAI_{eq}	59.1 dB	LAI_{eq} - LA_{eq}	2.1 dB

Exceedances		Count	Duration
LAS >	85.0 dB	0	0:00:00.0
LAS >	115.0 dB	0	0:00:00.0
LApeak >	135.0 dB	0	0:00:00.0
LApeak >	137.0 dB	0	0:00:00.0
LApeak >	140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight	
	57.0 dB	57.0 dB	0.0 dB	
	LDEN	**LDay**	**LEve**	**LNight**
	57.0 dB	57.0 dB	--- dB	--- dB

Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	57.0 dB		68.2 dB		--- dB	
$Ls_{(max)}$	75.0 dB	2022-03-22 09:14:57	--- dB		--- dB	
$LS_{(min)}$	41.6 dB	2022-03-22 09:13:33	--- dB		--- dB	
$L_{Peak(max)}$	92.6 dB	2022-03-22 09:12:45	--- dB		--- dB	

Overloads	Count	Duration	OBA Count	OBA Duration
	0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	62.4 dB
LAS 10.0	57.8 dB
LAS 33.3	50.1 dB
LAS 50.0	48.6 dB
LAS 66.6	47.5 dB
LAS 90.0	45.3 dB

Noise Measurement Field Data

Project:	469 Piercy Road	**Job Number:**	197532001
Site No.:	ST - 2	**Date:**	3/22/2022
Analyst:	Mia Berg	**Time:**	10:50 AM
Location:	363 Piercy Road		
Noise Sources:	Distant construction; Office parking lot noise		
Comments:			

Results (dBA):

	Leq:	Lmin:	Lmax:	Peak:
Measurement 1:	60.0	43.9	75.3	90.1

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	77°
Wind (mph):	10
Sky:	Clear
Bar. Pressure:	30.14"
Humidity:	32%

Photo:

Kimley»Horn

Measurement Report

Report Summary

Meter's File Name	LxT_Data.125.s	Computer's File Name	LxTse_0006073-20220322 094924-LxT_Data.125.ldbin
Meter	LxT SE 0006073		
Firmware	2.404		
User		Location	
Job Description			
Note			

Start Time	2022-03-22 09:49:24	Duration	0:10:00.0		
End Time	2022-03-22 09:59:24	Run Time	0:10:00.0	Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	60.0 dB		
LAE	87.8 dB	SEA	--- dB
EA	66.8 µPa²h		
LA_{peak}	90.1 dB	2022-03-22 09:49:48	
LAS_{max}	75.3 dB	2022-03-22 09:58:47	
LAS_{min}	43.9 dB	2022-03-22 09:53:00	
LA_{eq}	60.0 dB		
LC_{eq}	68.1 dB	LC_{eq} - LA_{eq}	8.1 dB
LAI_{eq}	62.1 dB	LAI_{eq} - LA_{eq}	2.1 dB

Exceedances

Exceedances	Count	Duration
LAS > 85.0 dB	0	0:00:00.0
LAS > 115.0 dB	0	0:00:00.0
LApeak > 135.0 dB	0	0:00:00.0
LApeak > 137.0 dB	0	0:00:00.0
LApeak > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight	
60.0 dB	60.0 dB	0.0 dB	
LDEN	**LDay**	**LEve**	**LNight**
60.0 dB	60.0 dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	60.0 dB		68.1 dB		--- dB	
$Ls_{(max)}$	75.3 dB	2022-03-22 09:58:47	--- dB		--- dB	
$LS_{(min)}$	43.9 dB	2022-03-22 09:53:00	--- dB		--- dB	
$L_{Peak(max)}$	90.1 dB	2022-03-22 09:49:48	--- dB		--- dB	

Overloads

Count	Duration	OBA Count	OBA Duration
0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	66.9 dB
LAS 10.0	64.2 dB
LAS 33.3	54.0 dB
LAS 50.0	50.1 dB
LAS 66.6	47.9 dB
LAS 90.0	45.8 dB

Noise Measurement Field Data

Project:	469 Piercy Road	**Job Number:**	197532001
Site No.:	ST - 3	**Date:**	3/22/2022
Analyst:	Ma Berg	**Time:**	11:05 AM
Location:	5890 Silver Creek Valley Road		
Noise Sources:	Construction Site		
Comments:			

Results (dBA):

	Leq:	Lmin:	Lmax:	Peak:
Measurement 1:	59.3	52.0	68.5	84.6

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	77°
Wind (mph):	10
Sky:	Clear
Bar. Pressure:	30.14"
Humidity:	32%

Photo:

Kimley»Horn

Measurement Report

Report Summary

Meter's File Name	LxT_Data.126.s	Computer's File Name	LxTse_0006073-20220322 100438-LxT_Data.126.ldbin
Meter	LxT SE 0006073		
Firmware	2.404		
User		Location	
Job Description			
Note			

Start Time	2022-03-22 10:04:38	Duration	0:10:00.0		
End Time	2022-03-22 10:14:38	Run Time	0:10:00.0	Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	59.3 dB		
LAE	87.1 dB	SEA	--- dB
EA	56.7 µPa²h		
LA_{peak}	84.6 dB	2022-03-22 10:12:08	
LAS_{max}	68.5 dB	2022-03-22 10:05:14	
LAS_{min}	52.0 dB	2022-03-22 10:06:58	
LA_{eq}	59.3 dB		
LC_{eq}	71.1 dB	LC_{eq} - LA_{eq}	11.8 dB
LAI_{eq}	60.4 dB	LAI_{eq} - LA_{eq}	1.1 dB

Exceedances

	Count	Duration
LAS > 85.0 dB	0	0:00:00.0
LAS > 115.0 dB	0	0:00:00.0
LApeak > 135.0 dB	0	0:00:00.0
LApeak > 137.0 dB	0	0:00:00.0
LApeak > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight	
59.3 dB	59.3 dB	0.0 dB	
LDEN	**LDay**	**LEve**	**LNight**
59.3 dB	59.3 dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	59.3 dB		71.1 dB		--- dB	
$Ls_{(max)}$	68.5 dB	2022-03-22 10:05:14	--- dB		--- dB	
$LS_{(min)}$	52.0 dB	2022-03-22 10:06:58	--- dB		--- dB	
$L_{Peak(max)}$	84.6 dB	2022-03-22 10:12:08	--- dB		--- dB	

Overloads

Count	Duration	OBA Count	OBA Duration
0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	63.5 dB
LAS 10.0	62.0 dB
LAS 33.3	59.0 dB
LAS 50.0	57.9 dB
LAS 66.6	56.7 dB
LAS 90.0	54.2 dB

Noise Measurement Field Data

Project:	469 Piercy Road	**Job Number:**	197532001
Site No.:	ST - 4	**Date:**	3/22/2022
Analyst:	Mia Berg	**Time:**	10:25 AM
Location:	475 Piercy Road		
Noise Sources:	Street Traffic		
Comments:			

Results (dBA):

	Leq:	Lmin:	Lmax:	Peak:
Measurement 1:	56.8	39.7	74.7	87.5

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	77°
Wind (mph):	10
Sky:	Clear
Bar. Pressure:	30.14"
Humidity:	32%

Photo:

Kimley»Horn

Measurement Report

Report Summary

Meter's File Name	LxT_Data.124.s	Computer's File Name	LxTse_0006073-20220322 092423-LxT_Data.124.ldbin
Meter	LxT SE 0006073		
Firmware	2.404		
User		Location	
Job Description			
Note			

Start Time	2022-03-22 09:24:23	Duration	0:10:00.0		
End Time	2022-03-22 09:34:23	Run Time	0:10:00.0	Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	56.8 dB		
LAE	84.6 dB	SEA	--- dB
EA	32.2 µPa²h		
LA_{peak}	87.5 dB	2022-03-22 09:31:18	
LAS_{max}	74.7 dB	2022-03-22 09:25:13	
LAS_{min}	39.7 dB	2022-03-22 09:26:03	
LA_{eq}	56.8 dB		
LC_{eq}	64.5 dB	LC_{eq} - LA_{eq}	7.6 dB
LAI_{eq}	58.7 dB	LAI_{eq} - LA_{eq}	1.9 dB

Exceedances

Exceedances		Count	Duration
LAS >	85.0 dB	0	0:00:00.0
LAS >	115.0 dB	0	0:00:00.0
LApeak >	135.0 dB	0	0:00:00.0
LApeak >	137.0 dB	0	0:00:00.0
LApeak >	140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight	
56.8 dB	56.8 dB	0.0 dB	
LDEN	**LDay**	**LEve**	**LNight**
56.8 dB	56.8 dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	56.8 dB		64.5 dB		--- dB	
$Ls_{(max)}$	74.7 dB	2022-03-22 09:25:13	--- dB		--- dB	
$LS_{(min)}$	39.7 dB	2022-03-22 09:26:03	--- dB		--- dB	
$L_{Peak(max)}$	87.5 dB	2022-03-22 09:31:18	--- dB		--- dB	

Overloads

Count	Duration	OBA Count	OBA Duration
0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	60.4 dB
LAS 10.0	54.0 dB
LAS 33.3	45.6 dB
LAS 50.0	44.6 dB
LAS 66.6	43.8 dB
LAS 90.0	42.1 dB

Noise Measurement Field Data

Project:	469 Piercy Road	**Job Number:**	197532001
Site No.:	LT-1	**Date:**	3/23/2022-3/24/2022
Analyst:	Noemi Wyss	**Time:**	11:54 a.m.- 12:04 p.m.
Location:	469 Piercy Road		
Noise Sources:	Traffic along nearby roads		
Comments:			

Results (dBA):

	Leq:	Lmin:	Lmax:	Peak:
Measurement 1:	64.1	35.8	97.6	115.8

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	77°
Wind (mph):	10
Sky:	Clear
Bar. Pressure:	30.14"
Humidity:	32%

Photo:

Kimley»Horn

Measurement Report

Report Summary

Meter's File Name	LxT_Data.131.s	Computer's File Name	LxTse_0006073-20220322 115432-LxT_Data.131.ldbin
Meter	LxT SE 0006073		
Firmware	2.404		
User		Location	
Job Description			
Note			

Start Time	2022-03-22 11:54:32	Duration	24:09:58.0		
End Time	2022-03-23 12:04:30	Run Time	24:09:58.0	Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	64.1 dB		
LAE	113.5 dB	SEA	--- dB
EA	24.8 mPa²h		
LA_{peak}	115.8 dB	2022-03-22 16:15:52	
LAS_{max}	97.6 dB	2022-03-22 16:15:52	
LAS_{min}	35.8 dB	2022-03-23 01:20:19	
LA_{eq}	64.1 dB		
LC_{eq}	69.9 dB	LC_{eq} - LA_{eq}	5.9 dB
LAI_{eq}	65.9 dB	LAI_{eq} - LA_{eq}	1.8 dB

Exceedances

Exceedances	Count	Duration
LAS > 85.0 dB	10	0:00:32.6
LAS > 115.0 dB	0	0:00:00.0
LApeak > 135.0 dB	0	0:00:00.0
LApeak > 137.0 dB	0	0:00:00.0
LApeak > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight	
67.8 dB	65.4 dB	0.0 dB	
LDEN	**LDay**	**LEve**	**LNight**
68.1 dB	65.9 dB	62.7 dB	60.1 dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	64.1 dB		69.9 dB		--- dB	
$Ls_{(max)}$	97.6 dB	2022-03-22 16:15:52	--- dB		--- dB	
$LS_{(min)}$	35.8 dB	2022-03-23 01:20:19	--- dB		--- dB	
$L_{Peak(max)}$	115.8 dB	2022-03-22 16:15:52	--- dB		--- dB	

Overloads

Count	Duration	OBA Count	OBA Duration
0	0:00:00.0	0	0:00:00.0

Statistics

LAS 5.0	68.8 dB
LAS 10.0	67.5 dB
LAS 33.3	63.2 dB
LAS 50.0	59.7 dB
LAS 66.6	54.7 dB
LAS 90.0	46.1 dB

FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels

Project Name:
Project Number:
Scenario: Existing
Ldn/CNEL: Ldn

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

								Vehicle Mix		Distance from Centerline of Roadway				
				Median	ADT	Speed	Alpha	Medium	Heavy	Ldn at	Distance to Contour			
#	Roadway	Segment	Lanes	Width	Volume	(mph)	Factor	Trucks	Trucks	100 Feet	70 Ldn	65 Ldn	60 Ldn	55 Ldn
1	Piercy Road	East of Hellyer Avenue	2	10	1,470	30	0	1.0%	1.0%	50.5	-	-	-	-
2	Silver Creek Valley Road	West of Piercy Road	5	27	20,350	45	0	1.0%	1.0%	65.4	-	109	345	1,091
3	Hellyer Ave	North of Piercy Road	4	20	7,150	45	0	1.0%	1.0%	60.7	-	-	117	370
4	Hellyer Ave	South of Piercy Road	2	20	7,700	45	0	1.0%	1.0%	60.9	-	-	123	388

[1] Distance is from the centerline of the roadway segment to the receptor location.
"-" = contour is located within the roadway right-of-way.

FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels

Project Name:
Project Number:
Scenario: Existing Plus Project
Ldn/CNEL: Ldn

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

								Vehicle Mix		Distance from Centerline of Roadway				
				Median	ADT	Speed	Alpha	Medium	Heavy	Ldn at	Distance to Contour			
#	Roadway	Segment	Lanes	Width	Volume	(mph)	Factor	Trucks	Trucks	100 Feet	70 Ldn	65 Ldn	60 Ldn	55 Ldn
1	Piercy Road	East of Hellyer Avenue	2	10	1,610	30	0	1.5%	1.5%	52.1	-	-	-	51
2	Silver Creek Valley Road	West of Piercy Road	5	27	20,563	45	0	1.0%	1.0%	65.4	-	110	349	1,102
3	Hellyer Ave	North of Piercy Road	4	20	7,230	45	0	1.1%	1.1%	60.9	-	-	123	388
4	Hellyer Ave	South of Piercy Road	2	20	7,710	45	0	1.1%	1.1%	61.0	-	-	127	402

[1] Distance is from the centerline of the roadway segment to the receptor location.
"-" = contour is located within the roadway right-of-way.

FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels

Project Name:
Project Number:
Scenario: Opening Year
Ldn/CNEL: Ldn

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

								Vehicle Mix		Distance from Centerline of Roadway				
				Median	ADT	Speed	Alpha	Medium	Heavy	Ldn at	Distance to Contour			
#	Roadway	Segment	Lanes	Width	Volume	(mph)	Factor	Trucks	Trucks	100 Feet	70 Ldn	65 Ldn	60 Ldn	55 Ldn
1	Piercy Road	East of Hellyer Avenue	2	10	1,950	30	0	1.0%	1.0%	51.8	-	-	-	47
2	Silver Creek Valley Road	West of Piercy Road	5	27	35,220	45	0	1.0%	1.0%	67.8	-	189	597	1,888
3	Hellyer Ave	North of Piercy Road	4	20	9,590	45	0	1.0%	1.0%	62.0	-	-	157	496
4	Hellyer Ave	South of Piercy Road	2	20	11,510	45	0	1.0%	1.0%	62.6	-	58	183	579

[1] Distance is from the centerline of the roadway segment to the receptor location.
"-" = contour is located within the roadway right-of-way.

FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels

Project Name:
Project Number:
Scenario: Opening Year Plus Project
Ldn/CNEL: Ldn

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

								Vehicle Mix			Distance from Centerline of Roadway			
				Median	ADT	Speed	Alpha	Medium	Heavy	Ldn at	Distance to Contour			
#	Roadway	Segment	Lanes	Width	Volume	(mph)	Factor	Trucks	Trucks	100 Feet	70 Ldn	65 Ldn	60 Ldn	55 Ldn
1	Piercy Road	East of Hellyer Avenue	2	10	2,090	30	0	1.4%	1.4%	53.0	-	-	-	63
2	Silver Creek Valley Road	West of Piercy Road	5	27	35,433	45	0	1.0%	1.0%	67.8	-	190	601	1,899
3	Hellyer Ave	North of Piercy Road	4	20	9,670	45	0	1.1%	1.1%	62.1	-	-	164	518
4	Hellyer Ave	South of Piercy Road	2	20	11,520	45	0	1.1%	1.1%	62.8	-	60	190	601

[1] Distance is from the centerline of the roadway segment to the receptor location.
"-" = contour is located within the roadway right-of-way.

FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels

Project Name:
Project Number:
Scenario: Horizon Year
Ldn/CNEL: Ldn

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

								Vehicle Mix		Distance from Centerline of Roadway				
				Median	ADT	Speed	Alpha	Medium	Heavy	Ldn at	Distance to Contour			
#	Roadway	Segment	Lanes	Width	Volume	(mph)	Factor	Trucks	Trucks	100 Feet	70 Ldn	65 Ldn	60 Ldn	55 Ldn
1	Piercy Road	East of Hellyer Avenue	2	10	2,310	30	0	1.0%	1.0%	52.5	-	-	-	56
2	Silver Creek Valley Road	West of Piercy Road	5	27	35,540	45	0	1.0%	1.0%	67.8	-	190	602	1,905
3	Hellyer Ave	North of Piercy Road	4	20	9,750	45	0	1.0%	1.0%	62.0	-	-	160	505
4	Hellyer Ave	South of Piercy Road	2	20	11,590	45	0	1.0%	1.0%	62.7	-	58	184	583

[1] Distance is from the centerline of the roadway segment to the receptor location.
"-" = contour is located within the roadway right-of-way.

FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels

Project Name:
Project Number:
Scenario: Horizon Year Plus Project
Ldn/CNEL: Ldn

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

								Vehicle Mix			Distance from Centerline of Roadway			
				Median	ADT	Speed	Alpha	Medium	Heavy	Ldn at		Distance to Contour		
#	Roadway	Segment	Lanes	Width	Volume	(mph)	Factor	Trucks	Trucks	100 Feet	70 Ldn	65 Ldn	60 Ldn	55 Ldn
1	Piercy Road	East of Hellyer Avenue	2	10	2,450	30	0	1.3%	1.3%	53.5	-	-	-	70
2	Silver Creek Valley Road	West of Piercy Road	5	27	35,753	45	0	1.0%	1.0%	67.8	-	192	606	1,916
3	Hellyer Ave	North of Piercy Road	4	20	9,830	45	0	1.1%	1.1%	62.2	-	-	167	527
4	Hellyer Ave	South of Piercy Road	2	20	11,600	45	0	1.1%	1.1%	62.8	-	60	191	605

[1] Distance is from the centerline of the roadway segment to the receptor location.
"-" = contour is located within the roadway right-of-way.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/31/2022
Case Description: Site Prep

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residential SW	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	420	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Compressor (air)		59.2	55.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	59.2	55.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residential W	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	990	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Compressor (air)		51.7	47.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	51.7	47.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial	Industrial	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	360	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Compressor (air)		60.5	56.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	60.5	56.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/31/2022
Case Description: Construction

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residential SW	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Man Lift	No	20		74.7	420	0
Generator	No	50		80.6	420	0
Tractor	No	40	84		420	0
Welder / Torch	No	40		74	420	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Man Lift		56.2	49.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator		62.1	59.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		65.5	61.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch		55.5	51.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	65.5	63.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residential W	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Man Lift	No	20		74.7	990	0
Generator	No	50		80.6	990	0
Tractor	No	40	84		990	0
Welder / Torch	No	40		74	990	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Man Lift		48.8	41.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator		54.7	51.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		58.1	54.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch		48.1	44.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	58.1	56.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial	Industrial	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Man Lift	No	20		74.7	360	0
Generator	No	50		80.6	360	0
Tractor	No	40	84		360	0
Welder / Torch	No	40		74	360	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Man Lift		57.6	50.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator		63.5	60.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		66.9	62.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch		56.9	52.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	66.9	65.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/31/2022
Case Description: Demo

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residential SW	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	420	0
Excavator	No	40		80.7	420	0
Dozer	No	40		81.7	420	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq	Noise Limit Exceedance (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq
Concrete Saw		71.1	64.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		62.2	58.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		63.2	59.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	71.1	66.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residential W	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	990	0
Excavator	No	40		80.7	990	0
Dozer	No	40		81.7	990	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq	Noise Limit Exceedance (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq
Concrete Saw		63.6	56.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		54.8	50.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		55.7	51.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	63.6	58.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial	Industrial	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	360	0
Excavator	No	40		80.7	360	0
Dozer	No	40		81.7	360	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq	Noise Limit Exceedance (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq
Concrete Saw		72.4	65.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator		63.6	59.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		64.5	60.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	72.4	67.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/31/2022
Case Description: Grading

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residential SW	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	420	0
Grader	No	40	85		420	0
Dozer	No	40		81.7	420	0
Tractor	No	40	84		420	0

Results

Equipment		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator		62.2	58.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader		66.5	62.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		63.2	59.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		65.5	61.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	66.5	66.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residential W	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	990	0
Grader	No	40	85		990	0
Dozer	No	40		81.7	990	0
Tractor	No	40	84		990	0

Results

Equipment		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator		54.8	50.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader		59.1	55.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		55.7	51.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		58.1	54.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	59.1	59.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial	Industrial	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	360	0
Grader	No	40	85		360	0
Dozer	No	40		81.7	360	0
Tractor	No	40	84		360	0

Results

Equipment		Calculated (dBA)		Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
				Day		Evening		Night		Day		Evening		Night	
		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator		63.6	59.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grader		67.9	63.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer		64.5	60.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor		66.9	62.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	67.9	68.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/31/2022
Case Descriptio Paving

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residential SW	Residential	1	1	1

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	420	0
Roller	No	20		80	420	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq	Noise Limit Exceedance (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq
Paver		58.7	55.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller		61.5	54.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	61.5	58.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residential W	Residential	1	1	1

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	990	0
Roller	No	20		80	990	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq	Noise Limit Exceedance (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq
Paver		51.3	48.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller		54.1	47.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	54.1	50.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial	Industrial	1	1	1

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	360	0
Roller	No	20		80	360	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq	Noise Limit Exceedance (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq
Paver		60.1	57.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller		62.9	55.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	62.9	59.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/31/2022
Case Description: Site Prep

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residential SW	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	420	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Compressor (air)		59.2	55.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	59.2	55.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Residential W	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	990	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Compressor (air)		51.7	47.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	51.7	47.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial	Industrial	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	360	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Compressor (air)		60.5	56.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Total	60.5	56.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.