San Leandro Industrial

NOISE IMPACT ANALYSIS

CITY OF SAN LEANDRO

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TABLE OF CONTENTS

APPENDICES

LIST OF EXHIBITS

LIST OF TABLES

LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
AIA	Airport Influence Area
ALUCP	Airport Land Use Compatibility Plan
ANSI	American National Standards Institute
Calveno	California Vehicle Noise
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dBA	A-weighted decibels
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
INCE	Institute of Noise Control Engineering
L_{eq}	Equivalent continuous (average) sound level
L_{max}	Maximum level measured over the time interval
L_{min}	Minimum level measured over the time interval
mph	Miles per hour
OPR	Office of Planning and Research
PPV	Peak particle velocity
Project	San Leandro Industrial
REMEL	Reference Energy Mean Emission Level
RMS	Root-mean-square
VdB	Vibration Decibels

EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine the potential noise impacts and the necessary noise mitigation measures, if any, for the proposed San Leandro Industrial development ("Project"). The proposed Project is to consist of 71,200 square feet (sf) of warehousing use in a single building. This study has been prepared to satisfy applicable City of San Leandro standards and thresholds of significance based on guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines (1).

The results of this San Leandro Industrial Noise Impact Analysis are summarized below based on the significance criteria in Section 4 of this report. Table ES-1 shows the findings of significance for each potential noise and/or vibration impact under CEQA before and after any required mitigation measures.

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
Off-Site Traffic Noise	7	*Less Than Significant*	-
Operational Noise	9	*Less Than Significant*	-
Construction Noise	10	*Less Than Significant*	-
Construction Vibration		*Less Than Significant*	-

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1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of the proposed San Leandro Industrial ("Project"). This noise study briefly describes the proposed Project, provides information regarding noise fundamentals, sets out the local regulatory setting, presents the study methods and procedures for transportation related CNEL traffic noise analysis, and evaluates the future exterior noise environment. In addition, this study includes an analysis of the potential Project-related long-term stationary-source operational noise and short-term construction noise and vibration impacts.

1.1 SITE LOCATION

The proposed project is located at 1750 Doolittle Drive in the City of San Leandro as shown on Exhibit 1-A.

1.2 PROJECT DESCRIPTION

The proposed Project is to consist of the development of a warehouse building with up to 71,200 square feet (sf) of building space as shown on Exhibit 1-B. The on-site Project-related noise sources are expected to include: loading dock activity, roof-top air conditioning units, trash enclosure activity, parking lot vehicle movements, and truck movements. This noise analysis is intended to describe noise level impacts associated with the expected typical operational activities at the Project site.

EXHIBIT 1-A: LOCATION MAP

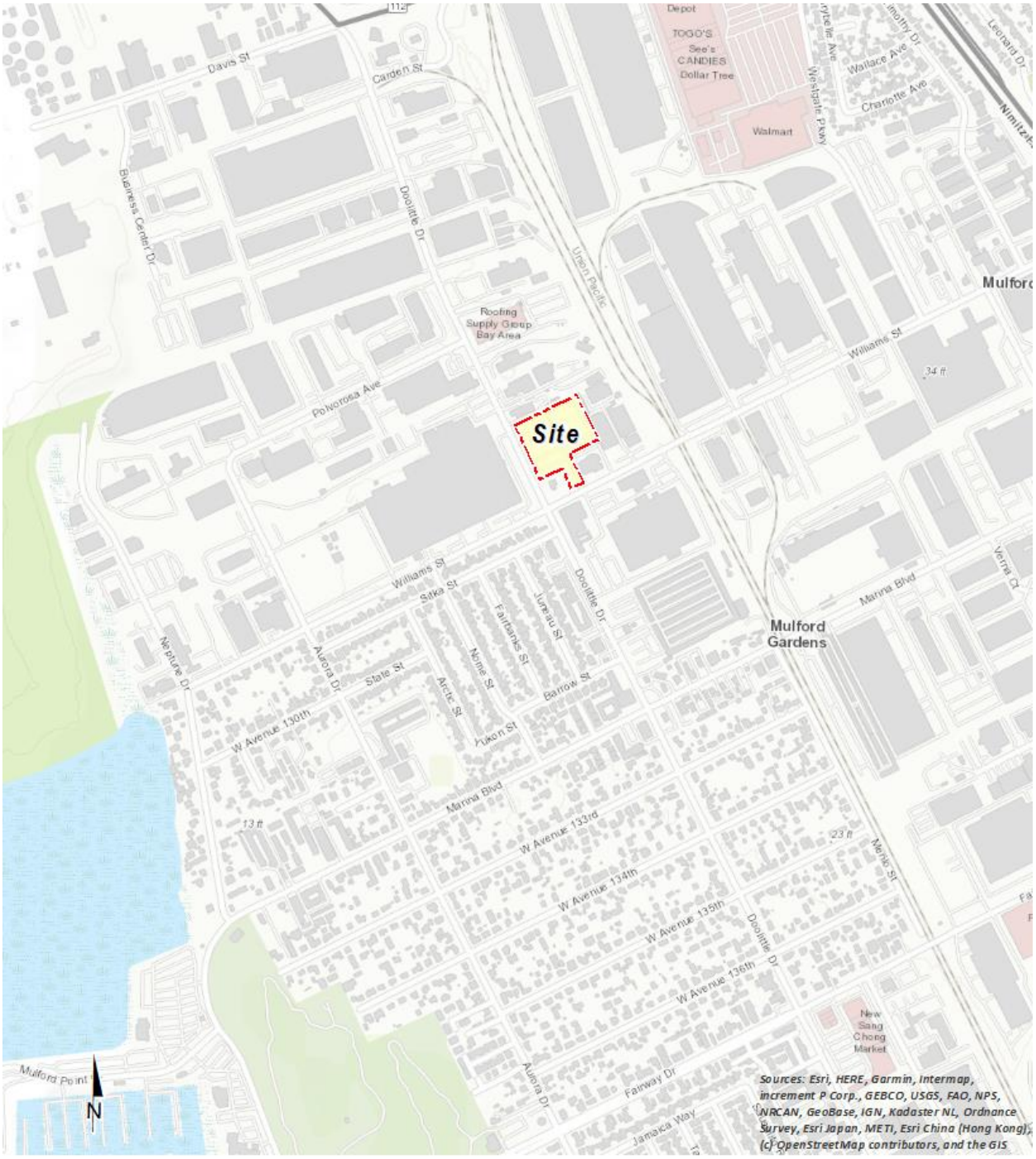
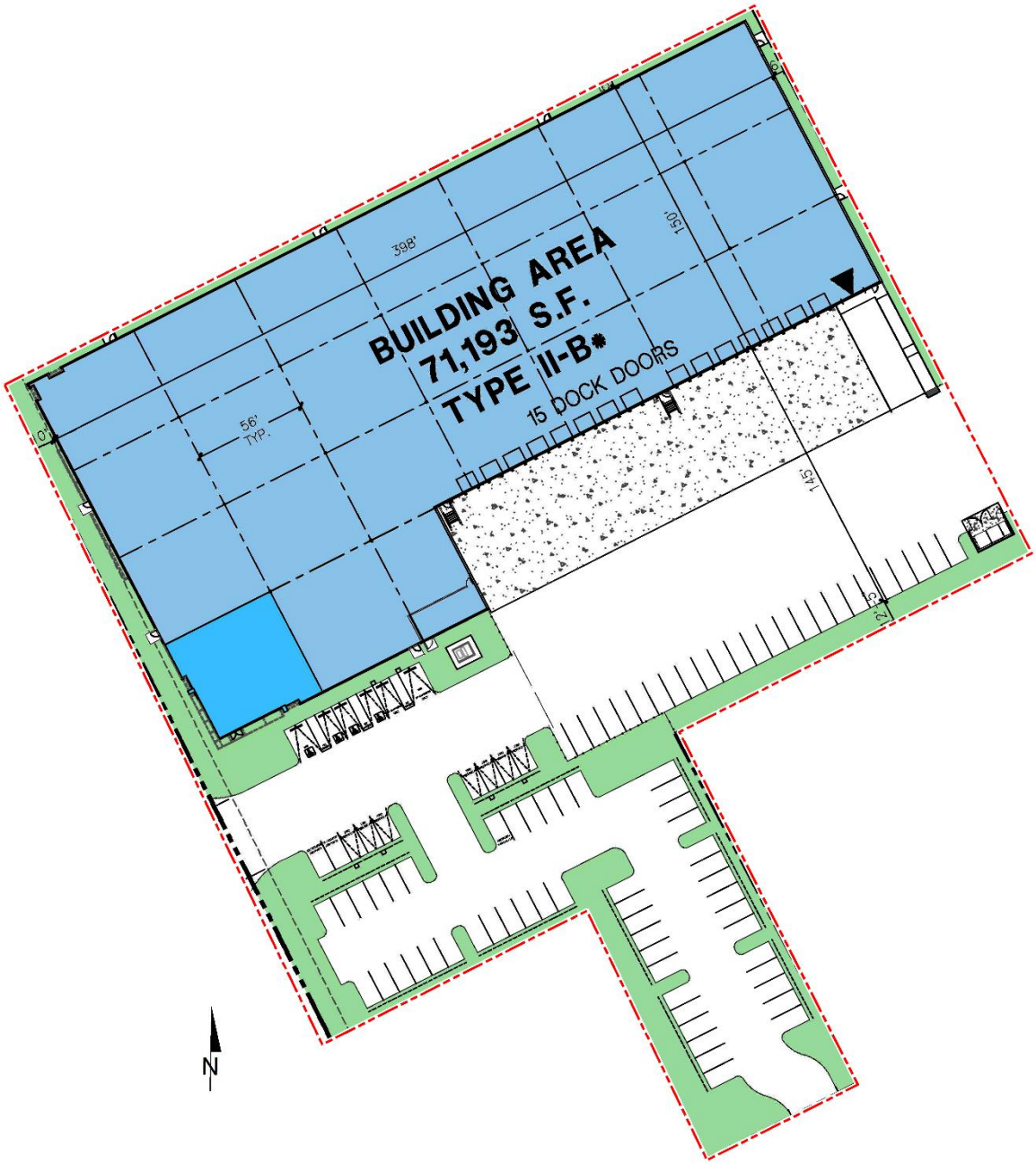


EXHIBIT 1-B: SITE PLAN



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2 FUNDAMENTALS

Noise is simply defined as "unwanted sound." Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Noise is measured on a logarithmic scale of sound pressure level known as a decibel (dB). A-weighted decibels (dBA) approximate the subjective response of the human ear to broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies which are audible to the human ear. Exhibit 2-A presents a summary of the typical noise levels and their subjective loudness and effects that are described in more detail below.

EXHIBIT 2-A: TYPICAL NOISE LEVELS

COMMON OUTDOOR ACTIVITIES	COMMON INDOOR ACTIVITIES	A - WEIGHTED SOUND LEVEL dBA	SUBJECTIVE LOUDNESS	EFFECTS OF NOISE
THRESHOLD OF PAIN		140	INTOLERABLE OR DEAFENING	HEARING LOSS
NEAR JET ENGINE		130		
		120		
JET FLY-OVER AT 300m (1000 ft)	ROCK BAND	110		
LOUD AUTO HORN		100	VERY NOISY	
GAS LAWN MOWER AT 1m (3 ft)		90		
DIESEL TRUCK AT 15m (50 ft), at 80 km/hr (50 mph)	FOOD BLENDER AT 1m (3 ft)	80		SPEECH INTERFERENCE
NOISY URBAN AREA, DAYTIME	VACUUM CLEANER AT 3m (10 ft)	70	LOUD	
HEAVY TRAFFIC AT 90m (300 ft)	NORMAL SPEECH AT 1m (3 ft)	60		
QUIET URBAN DAYTIME	LARGE BUSINESS OFFICE	50	MODERATE	SLEEP DISTURBANCE
QUIET URBAN NIGHTTIME	THEATER, LARGE CONFERENCE ROOM (BACKGROUND)	40		
QUIET SUBURBAN NIGHTTIME	LIBRARY	30	FAINT	NO EFFECT
QUIET RURAL NIGHTTIME	BEDROOM AT NIGHT, CONCERT HALL (BACKGROUND)	20		
	BROADCAST/RECORDING STUDIO	10	VERY FAINT	
LOWEST THRESHOLD OF HUMAN HEARING	LOWEST THRESHOLD OF HUMAN HEARING	0		

Source: Environmental Protection Agency Office of Noise Abatement and Control, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (EPA/ONAC 550/9-74-004) March 1974.

2.1 RANGE OF NOISE

Since the range of intensities that the human ear can detect is so large, the scale frequently used to measure intensity is a scale based on multiples of 10, the logarithmic scale. The scale for measuring intensity is the decibel scale. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud. (2) The most common sounds vary between 40 dBA (very quiet) to 100 dBA (very loud). Normal conversation at three feet is roughly at 60 dBA, while loud jet engine noises equate to 110 dBA

at approximately 1,000 feet, which can cause serious discomfort. (3) Another important aspect of noise is the duration of the sound and the way it is described and distributed in time.

2.2 NOISE DESCRIPTORS

Environmental noise descriptors are generally based on averages, rather than instantaneous, noise levels. The most used metric is the equivalent level (L_{eq}). Equivalent sound levels are not measured directly but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level (L_{eq}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period and is commonly used to describe the "average" noise levels within the environment.

Peak hour or average noise levels, while useful, do not completely describe a given noise environment. Noise levels lower than peak hour may be disturbing if they occur during times when quiet is most desirable, namely evening and nighttime (sleeping) hours. To account for this, the Community Noise Equivalent Level (CNEL), representing a composite 24-hour noise level is utilized. The CNEL is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time-of-day corrections require the addition of 5 decibels to dBA L_{eq} sound levels in the evening from 7:00 p.m. to 10:00 p.m., and the addition of 10 decibels to dBA L_{eq} sound levels at night between 10:00 p.m. and 7:00 a.m. These additions are made to account for the noise sensitive time periods during the evening and night hours when noise can become more intrusive. CNEL does not represent the actual sound level heard at any time, but rather represents the total sound exposure. The City of San Leandro relies on the 24-hour CNEL level to assess land use compatibility with transportation related noise sources.

2.3 SOUND PROPAGATION

When sound propagates over a distance, it changes in level and frequency content. The way noise reduces with distance depends on the following factors.

2.3.1 GEOMETRIC SPREADING

Sound from a localized source (i.e., a stationary point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source. (2)

2.3.2 GROUND ABSORPTION

The propagation path of noise from a highway to a receiver is usually very close to the ground. Noise attenuation from ground absorption and reflective wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually

sufficiently accurate for distances of less than 200 ft. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receiver such as soft dirt, grass, or scattered bushes and trees), an excess ground attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance from a line source. (4)

2.3.3 ATMOSPHERIC EFFECTS

Receivers located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects. (2)

2.3.4 SHIELDING

A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Shielding by trees and other such vegetation typically only has an "out of sight, out of mind" effect. That is, the perception of noise impact tends to decrease when vegetation blocks the line-of-sight to nearby residents. However, for vegetation to provide a substantial, or even noticeable, noise reduction, the vegetation area must be at least 15 feet in height, 100 feet wide and dense enough to completely obstruct the line-of-sight between the source and the receiver. This size of vegetation may provide up to 5 dBA of noise reduction. The Federal Highway Administration (FHWA) does not consider the planting of vegetation to be a noise abatement measure. (5)

2.4 NOISE CONTROL

Noise control is the process of obtaining an acceptable noise environment for an observation point or receiver by controlling the noise source, transmission path, receiver, or all three. This concept is known as the source-path-receiver concept. In general, noise control measures can be applied to these three elements.

2.5 NOISE BARRIER ATTENUATION

Effective noise barriers can reduce noise levels by 10 to 15 dBA, cutting the loudness of traffic noise in half. A noise barrier is most effective when placed close to the noise source or receiver. Noise barriers, however, do have limitations. For a noise barrier to work, it must block the line-of-sight path of sound from the noise source.

2.6 LAND USE COMPATIBILITY WITH NOISE

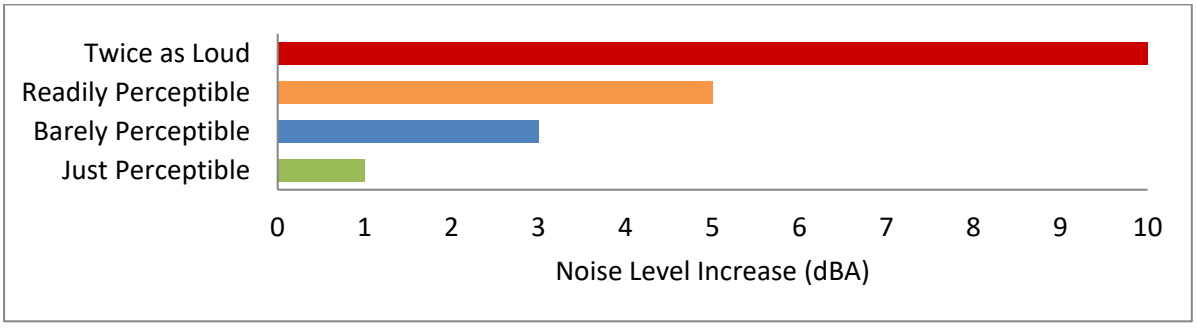
Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches, and residences are more sensitive to noise intrusion than are commercial or industrial developments and related activities. As ambient noise levels affect the perceived amenity or livability of a development, so too can the mismanagement of noise impacts impair the economic health and growth potential of a community by reducing the area's desirability as a place to live, shop and work. For this reason, land use compatibility with the noise environment is an important consideration in the planning and design process. The FHWA encourages State and Local government to regulate land development in such a way that noise-sensitive land uses are either prohibited from being located adjacent to a highway, or that the developments are planned, designed, and constructed in such a way that noise impacts are minimized. (6)

2.7 COMMUNITY RESPONSE TO NOISE

Approximately sixteen percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints may occur. Twenty to thirty percent of the population will not complain even in very severe noise environments. (7 pp. 8-6) Thus, a variety of reactions can be expected from people exposed to any given noise environment.

Surveys have shown that community response to noise varies from no reaction to vigorous action for newly introduced noises averaging from 10 dB below existing to 25 dB above existing. (8) According to research originally published in the Noise Effects Handbook (7), the percentage of high annoyance ranges from approximately 0 percent at 45 dB or less, 10 percent are highly annoyed around 60 dB, and increases rapidly to approximately 70 percent being highly annoyed at approximately 85 dB or greater. Despite this variability in behavior on an individual level, the population can be expected to exhibit the following responses to changes in noise levels as shown on Exhibit 2-B. A change of 3 dBA is considered barely perceptible, and changes of 5 dBA are considered readily perceptible. (4)

EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION



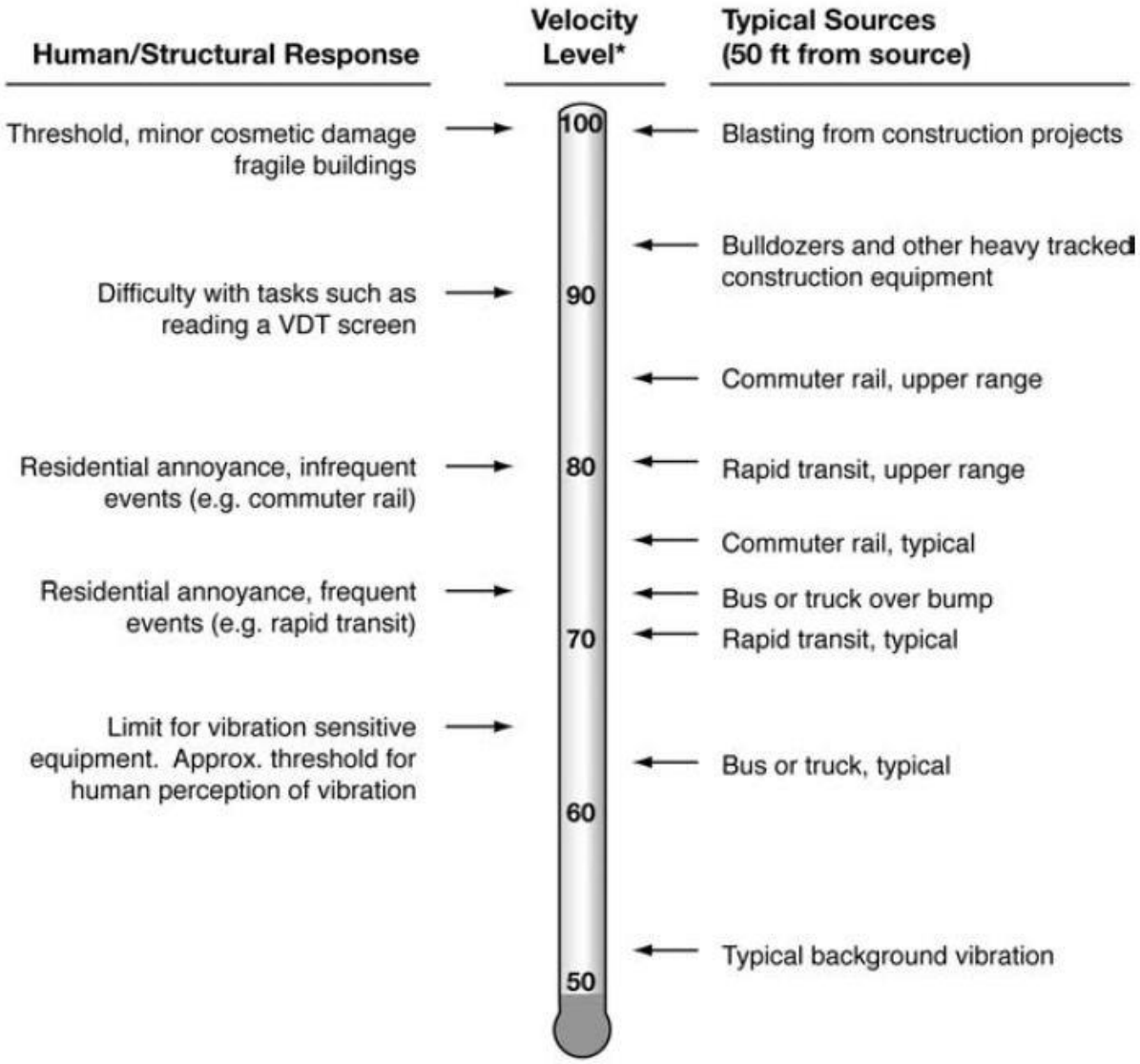
2.8 VIBRATION

Per the Federal Transit Administration (FTA) *Transit Noise Impact and Vibration Impact Assessment Manual* (8) , vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structure-borne noise. Sources of ground-borne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, such as factory machinery, or transient, such as explosions. As is the case with airborne sound, ground-borne vibrations may be described by amplitude and frequency.

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings but is not always suitable for evaluating human response (annoyance) because it takes some time for the human body to respond to vibration signals. Instead, the human body responds to average vibration amplitude often described as the root mean square (RMS). The RMS amplitude is defined as the average of the squared amplitude of the signal and is most frequently used to describe the effect of vibration on the human body. Decibel notation (VdB) is commonly used to measure RMS. Decibel notation (VdB) serves to reduce the range of numbers used to describe human response to vibration. Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receivers for vibration include structures (especially older masonry structures), people (especially residents, the elderly, and sick), and vibration-sensitive equipment and/or activities.

The background vibration-velocity level in residential areas is generally 50 VdB. Ground-borne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground-borne vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Exhibit 2-C illustrates common vibration sources and the human and structural response to ground-borne vibration.

EXHIBIT 2-C: TYPICAL LEVELS OF GROUND-BORNE VIBRATION



** RMS Vibration Velocity Level in VdB relative to 10^{-6} inches/second*

Source: Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual.

3 REGULATORY SETTING

The federal government, the State of California, various county governments, and most municipalities in the state have established standards and ordinances to control noise. In most areas, automobile and truck traffic is the major source of environmental noise. Traffic activity generally produces an average sound level that remains constant with time. Air and rail traffic, and commercial and industrial activities are also major sources of noise in some areas. Federal, state, and local agencies regulate different aspects of environmental noise. Federal and state agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources is left to local agencies.

3.1 STATE OF CALIFORNIA NOISE REQUIREMENTS

The State of California regulates freeway noise, sets standards for sound transmission, provides occupational noise control criteria, identifies noise standards, and provides guidance for local land use compatibility. State law requires that each county and city adopt a General Plan that includes a Noise Element which is to be prepared per guidelines adopted by the Governor's Office of Planning and Research (OPR). (9) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*. In addition, the California Environmental Quality Act (CEQA) requires that all known environmental effects of a project be analyzed, including environmental noise impacts.

3.2 CITY OF SAN LEANDRO GENERAL PLAN NOISE ELEMENT

The City of San Leandro has adopted the state-mandated noise element in the Chapter 7 of the General Plan (10) Environmental Hazards to control and abate environmental noise, and to protect the citizens of the City of San Leandro from excessive exposure to noise. The City of San Leandro General Plan identifies several goals and policies to minimize the impacts of excessive noise levels throughout the community and establishes noise level requirements for all land uses. To limit the exposure of City residents to excessive noise, the City of San Leandro General Plan Noise Element contains the following two goals:

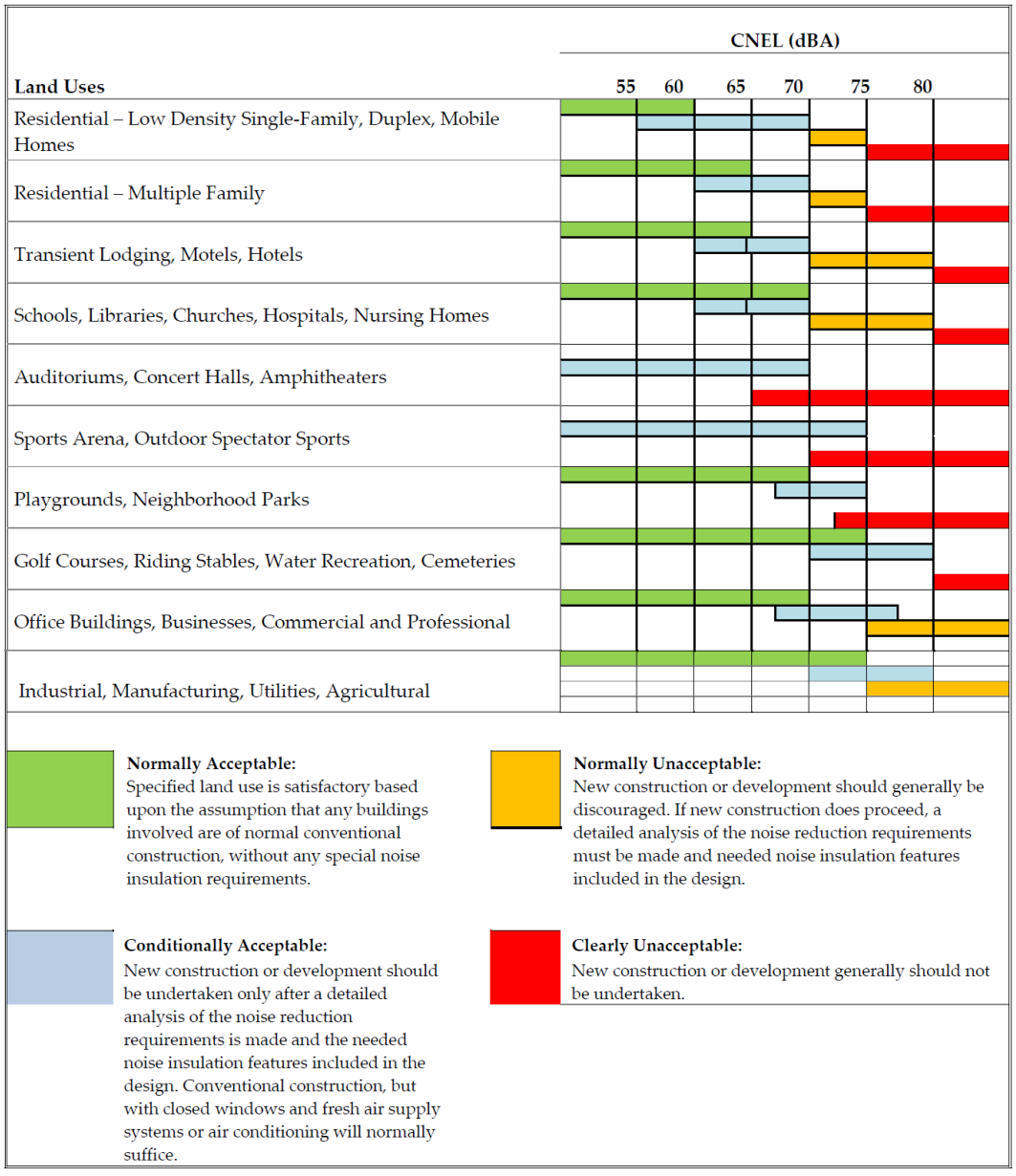
EH-8 *Reduce the effects of surface transportation noise, including vehicular noise and noise associated with railroad and BART traffic.*

EH-9 *Minimize the local impacts and hazards created by air traffic, ground operations, and all other aviation activities, particularly those associated with Oakland International Airport.*

The City of San Leandro has adopted the transportation noise criteria contained in the California Office of Planning and Research (OPR) *General Plan Guidelines*. (9) The City of San Leandro Land Use Compatibility Guidelines (Chart 7-2) are used by many California cities and counties and specify the maximum noise levels allowable for new developments impacted by transportation noise sources. The noise criteria identified in the City of San Leandro General Plan Noise Element, are guidelines to evaluate the land use compatibility of transportation-related noise. The compatibility criteria, shown on Exhibit 3-A, provide City of San Leandro with a planning tool to gauge the compatibility of land uses relative to existing and future exterior noise environment.

The land use compatibility criteria describes categories of compatibility, but not specific noise standards. According to these categories of transportation-related noise compatibility, the Project industrial land uses are considered *normally acceptable* with unmitigated exterior noise levels below 75 dBA CNEL and *conditionally acceptable* with noise levels between 70 and 80 dBA CNEL. For *conditionally acceptable* land use, *"new construction or development should be undertaken only after a detailed analysis of noise reduction requirements are made* (10).

EXHIBIT 3-A: GENERAL PLAN LAND USE NOISE COMPATIBILITY CRITERIA



3.3 OPERATIONAL NOISE STANDARDS

To analyze noise impacts originating from a designated fixed location or private property such as the San Leandro Industrial, stationary-source (operational) noise such as the expected loading dock activity, roof-top air conditioning units, trash enclosure activity, parking lot vehicle movements, and truck movements are typically evaluated against standards established under a jurisdiction's Municipal Code.

Chapter 4-1 Article 11. Noise of the City of San Leandro Municipal Code included in Appendix 3.1, provides restrictions and regulations for noise within the city. However, the municipal code does not contain numerical noise level limits and is aimed more at prohibiting "disturbing, excessive and offensive noises" so as to abate public nuisances relative to noise. According to Section 4-1-1110, it is unlawful for any person, as defined in Section 1-14-100[h] of this Code, to make, continue, or cause to be made or continued any disturbing, excessive or offensive noise which causes discomfort or annoyance to reasonable persons of normal sensitivity. The factors which should be considered in determining whether a violation of this section exists include the following:

1. The sound level of the objectionable noise.
2. The sound level of the ambient noise.
3. The proximity of the noise to residential property.
4. The zoning of the area.
5. The population density of the area.
6. The time of day or night.
7. The duration of the noise.
8. Whether the noise is recurrent, intermittent, or constant.
9. Whether the noise is produced by an industrial, commercial, or noncommercial activity.
10. Whether the nature of the noise is usual or unusual.

3.4 CONSTRUCTION NOISE STANDARDS

The City of San Leandro Municipal Code, Section 4-1-1115[b] prohibits construction work or related activity which is adjacent to or across a street or right-of-way from a residential use, except between the hours of 7:00 a.m. and 7:00 p.m. on weekdays, or between 8:00 a.m. and 7:00 p.m. on Sunday and Saturday. (12) In addition, neither the City of San Leandro General Plan or Municipal Code establish numeric maximum acceptable construction source noise levels at potentially affected receivers for CEQA analysis purposes. Therefore, a numerical construction threshold based on Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual* is used for analysis of daytime construction impacts, as discussed below.

According to the FTA, local noise ordinances are typically not very useful in evaluating construction noise. They usually relate to nuisance and hours of allowed activity, and sometimes specify limits in terms of maximum levels, but are generally not practical for assessing the impact of a construction project. Project construction noise criteria should account for the existing noise environment, the absolute noise levels during construction activities, the duration of the construction, and the adjacent land use. Due to the lack of standardized construction noise thresholds, the FTA provides guidelines that can be considered reasonable criteria for construction noise assessment. The FTA considers a daytime exterior construction noise level of 80 dBA L_{eq} as a reasonable threshold for noise sensitive residential land use (8 p. 179).

3.5 VIBRATION STANDARDS

Construction activity can result in varying degrees of ground-borne vibration, depending on the equipment and methods used, distance to the affected structures and soil type. Construction vibration is generally associated with pile driving and rock blasting. Other construction equipment such as air compressors, light trucks, hydraulic loaders, etc., generates little or no ground vibration (8). To analyze vibration impacts associated with the San Leandro Industrial, vibration-generating activities are appropriately evaluated against standards established under a City's Municipal Code if such standards exist. However, the City of San Leandro does not identify specific construction vibration level limits. Therefore, for analysis purposes, the Caltrans *Transportation and Construction Vibration Guidance Manual*, (13 p. 38) Table 19, a maximum acceptable continuous vibration damage threshold of 0.2 PPV (in/sec) is used in this noise study to assess potential temporary construction-related impacts at adjacent building locations.

3.6 OAKLAND INTERNATIONAL AIRPORT (OAK) LAND USE COMPATIBILITY

The Ontario International Airport (OAK) is located approximately 1.5 miles northwest of the Project site boundary. This places the Project site within the OAK Airport Influence Area (AIA), and the Project is subject to the *Oakland International Airport Land Use Compatibility Plan* (ALUCP). The ALUCP outlines policies for determining the land use compatibility of the Project to prevent the development of noise-sensitive land uses in that are exposed to aircraft noise.

The ALUCP noise contour boundaries are used to determine the potential aircraft-related noise impacts at the Project site and are found on Figure 3-3 of the ALUCP. As shown on Exhibit 3-B, the Project site is located outside the 60 dBA CNEL noise level contour boundaries. According to Table 3-1 of the ALUCP *Noise Compatibility Criteria* as shown on Exhibit 3-C, the planned Project *commercial and industrial* land use is considered *compatible* with exterior noise levels of less than 70 dBA CNEL. Therefore, based on the ALUCP compatibility criteria, activities associated with the land use may be carried out with essentially no interference from aircraft noise and standard construction methods will sufficiently attenuate exterior noise to an acceptable indoor community noise equivalent level (CNEL).

EXHIBIT 3-B: OAK AIRPORT NOISE CONTOURS

Source: Oakland International Airport (OAK) Land Use Compatibility Plan (ALUCP)

EXHIBIT 3-C: OAK NOISE COMPATIBILITY CRITERIA

Land Use Category	Exterior Noise Exposure (dB CNEL)		
	60	65	70
Agricultural, Recreational, and Animal-Related			
Outdoor amphitheaters			
Zoos; animal shelters; neighborhood parks; playgrounds			
Regional parks; athletic fields; golf courses; outdoor spectator sports; water recreation facilities			
Nature preserves; wildlife preserves; livestock breeding or farming			
Agriculture (except residences and livestock); fishing			
Residential, Lodging, and Care			
Residential, (including single-family, multi-family, and mobile homes)*			
Residential hotels; retirement homes; hospitals; nursing homes; intermediate care facilities			
Hotels; motels; other transient lodging			
Public			
Schools; libraries			
Auditoriums; concert halls; indoor arenas; places of worship; cemeteries			
Commercial and Industrial			
Office buildings; office areas of industrial facilities; medical clinics; clinical laboratories; commercial - retail; shopping centers; restaurants; movie theaters			
Commercial - wholesale; research and development			
Industrial; manufacturing; utilities; public rights-of-way			

Land Use	Acceptability	Interpretation/Comments
	Compatible	*Indoor Uses*: Standard construction methods will sufficiently attenuate exterior noise to an acceptable indoor community noise equivalent level (CNEL). *Outdoor Uses*: Activities associated with the land use may be carried out with essentially no interference from aircraft noise. * The maximum acceptable noise exposure for new residential development in the vicinity of OAK is anything below 60 CNEL (see Policy 3.3.1.2 (b).)
	Conditional	*Indoor Uses*: Building structure must be capable of attenuating exterior noise to the indoor CNEL of 45 dB; standard construction methods will normally suffice. *Outdoor Uses*: CNEL is acceptable for outdoor activities, although some noise interference may occur; caution should be exercised with regard to noise-sensitive uses.
	Incompatible	*Indoor Uses*: Unacceptable noise interference if windows are open; at exposures above 65 dB CNEL, extensive mitigation techniques are required to make the indoor environment acceptable for performance of activities. *Outdoor Uses*: Severe noise interference makes outdoor activities unacceptable.

4 SIGNIFICANCE CRITERIA

The following significance criteria are based on currently adopted guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1) For the purposes of this report, impacts would be potentially significant if the Project results in or causes:

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

B. Generation of excessive ground-borne vibration or ground-borne noise levels?

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

4.1 NOISE LEVEL INCREASES (THRESHOLD A)

Noise level increases resulting from the Project are evaluated based on the Appendix G CEQA Guidelines. Under CEQA, consideration must be given to the magnitude of the increase, the existing baseline ambient noise levels, and the location of receivers to determine if a noise increase represents a significant adverse environmental impact. This approach recognizes *that there is no single noise increase that renders the noise impact significant.* (14) This is primarily because of the wide variation in individual thresholds of annoyance and differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted—the so-called *ambient* environment. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will typically be judged.

The Federal Interagency Committee on Noise (FICON) (15) developed guidance to be used for the assessment of project-generated increases in noise levels that consider the ambient noise level. The FICON recommendations are based on studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (CNEL) and equivalent continuous noise level (L_{eq}).

As previously stated, the approach used in this noise study recognizes *that there is no single noise increase that renders the noise impact significant*, based on a 2008 California Court of Appeal ruling on Gray v. County of Madera. (14) For example, if the ambient noise environment is quiet (<60 dBA) and the new noise source greatly increases the noise levels, an impact may occur if the noise criteria may be exceeded. Therefore, for this analysis, a *readily perceptible* 5 dBA or greater project-related noise level increase is considered a significant impact when the without project noise levels are below 60 dBA. Per the FICON, in areas where the without project noise levels range from 60 to 65 dBA, a 3 dBA *barely perceptible* noise level increase appears to be appropriate for most people. When the without project noise levels already exceed 65 dBA, any increase in community noise louder than 1.5 dBA or greater is considered a significant impact if

the noise criteria for a given land use is exceeded, since it likely contributes to an existing noise exposure exceedance. The FICON guidance provides an established source of criteria to assess the impacts of substantial temporary or permanent increase in baseline ambient noise levels. Based on the FICON criteria, the amount to which a given noise level increase is considered acceptable is reduced when the without Project (baseline) noise levels are already shown to exceed certain land-use specific exterior noise level criteria. The specific levels are based on typical responses to noise level increases of 5 dBA or *readily perceptible*, 3 dBA or *barely perceptible*, and 1.5 dBA depending on the underlying without Project noise levels for noise-sensitive uses. These levels of increases and their perceived acceptance are consistent with guidance provided by both the Federal Highway Administration (4 p. 9) and Caltrans (16 p. 2_48).

4.2 VIBRATION (THRESHOLD B)

As described in Section 3.5, the vibration impacts originating from the construction of the San Leandro Industrial, vibration-generating activities are appropriately evaluated using the Caltrans vibration damage thresholds to assess potential temporary construction-related impacts at adjacent building locations. A maximum acceptable continuous vibration damage threshold of 0.2 PPV (in/sec) is used in this noise study to assess potential temporary construction-related impacts at adjacent building locations.

4.3 CEQA GUIDELINES NOT FURTHER ANALYZED (THRESHOLD C)

The closest airport which would require additional noise analysis under CEQA guideline C is the Oakland International Airport (OAK), which is located approximately is located approximately 1.5 miles northwest of the Project site boundary. The OAK Airport noise contour boundaries are presented on Exhibit 3-B of this report. As shown on Exhibit 3-B, the Project site is located outside the 60 dBA CNEL noise level contour boundaries. According to Table 3-1 of the ALUCP *Noise Compatibility Criteria* as shown on Exhibit 3-C, the planned Project *commercial and industrial* land use is considered *compatible* with exterior noise levels of less than 70 dBA CNEL. Therefore, airport noise impacts are considered *less than significant,* and no further noise analysis is provided under Guideline C.

4.4 SIGNIFICANCE CRITERIA SUMMARY

Noise impacts shall be considered significant if any of the following occur as a direct result of the proposed Project. Table 4-1 shows the significance criteria summary matrix that includes the allowable criteria used to identify potentially significant incremental noise level increases.

TABLE 4-1: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Condition(s)	Significance Criteria
Off-Site Traffic[1]	If ambient is < 60 dBA CNEL	≥ 5 dBA CNEL Project increase
	If ambient is 60 - 65 dBA CNEL	≥ 3 dBA CNEL Project increase
	If ambient is > 65 dBA CNEL	≥ 1.5 dBA CNEL Project increase
Operational[1]	If ambient is < 60 dBA L_{eq}	≥ 5 dBA L_{eq} Project increase
	If ambient is 60 - 65 dBA L_{eq}	≥ 3 dBA L_{eq} Project increase
	If ambient is > 65 dBA L_{eq}	≥ 1.5 dBA L_{eq} Project increase
Construction	Prohibited except between the hours of 7:00 a.m. to 7:00 p.m. on weekdays[2]	
	Noise Level Threshold[3]	80 dBA L_{eq}
	Vibration Level Threshold[4]	0.2 PPV (in/sec)

[1] FICON, 1992.
[2] City of San Leandro Municipal Code, Section 4-1-1115[b]
[3] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual.
[4] Caltrans Transportation and Construction Vibration Manual, April 2020 Table 19.

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5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, 24-hour noise level measurements were taken at four locations in the Project study area. The receiver locations were selected to describe and document the existing noise environment within the Project study area. Exhibit 5-A provides the boundaries of the Project study area and the noise level measurement locations. To fully describe the existing noise conditions, noise level measurements were collected by Urban Crossroads, Inc. on Wednesday, April 27th, 2022. Appendix 5.1 includes study area photos.

5.1 MEASUREMENT PROCEDURE AND CRITERIA

To describe the existing noise environment, the hourly noise levels were measured during typical weekday conditions over a 24-hour period. By collecting individual hourly noise level measurements, it is possible to describe the equivalent daytime and nighttime hourly noise levels. The long-term noise readings were recorded using Piccolo Type 2 integrating sound level meter and dataloggers. The Piccolo sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 150. All noise meters were programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (17)

5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned as close to the nearest receiver locations as possible to assess the existing ambient hourly noise levels surrounding the Project site. Both Caltrans and the FTA recognize that it is not reasonable to collect noise level measurements that can fully represent every part of a private yard, patio, deck, or balcony normally used for human activity when estimating impacts for new development projects. This is demonstrated in the Caltrans general site location guidelines which indicate that, *sites must be free of noise contamination by sources other than sources of interest. Avoid sites located near sources such as barking dogs, lawnmowers, pool pumps, and air conditioners unless it is the express intent of the analyst to measure these sources*. (2) Further, FTA guidance states, t*hat it is not necessary nor recommended that existing noise exposure be determined by measuring at every noise-sensitive location in the project area. Rather, the recommended approach is to characterize the noise environment for clusters of sites based on measurements or estimates at representative locations in the community*. (8)

Based on recommendations of Caltrans and the FTA, it is not necessary to collect measurements at each individual building or residence, because each receiver measurement represents a group of buildings that share acoustical equivalence. (8) In other words, the area represented by the receiver shares similar shielding, terrain, and geometric relationship to the reference noise source. Receivers represent a location of noise sensitive areas and are used to estimate the future noise level impacts. Collecting reference ambient noise level measurements at the nearby receiver locations allows for a comparison of the before and after Project noise levels and is

necessary to assess potential noise impacts due to the Project's contribution to the ambient noise levels.

5.3 NOISE MEASUREMENT RESULTS

The noise measurements presented below focus on the average or equivalent sound levels (L_{eq}). The equivalent sound level (L_{eq}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. Table 5-1 identifies the hourly daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) noise levels at each noise level measurement location.

TABLE 5-1: 24-HOUR AMBIENT NOISE LEVEL MEASUREMENTS

Location[1]	Description	Energy Average Noise Level (dBA L_{eq})[2]	
		Daytime	Nighttime
L1	Located east of the Project site near Alameda County Fire Department Station 10 at 2194 Williams Street.	58.9	54.3
L2	Located southeast of the Project site near single-family residence at 2021 Marina Boulevard.	62.7	57.9
L3	Located south of the Project site near Doolittle Apartments at 2011 Doolittle Drive # A1.	68.0	62.3
L4	Located west of the Project site near single-family residence at 2232 Sitka Street.	66.7	63.7

[1] See Exhibit 5-A for the noise level measurement locations.
[2] Energy (logarithmic) average levels. The long-term 24-hour measurement worksheets are included in Appendix 5.2. "Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

Table 5-1 provides the (energy average) noise levels used to describe the daytime and nighttime ambient conditions. These daytime and nighttime energy average noise levels represent the average of all hourly noise levels observed during these time periods expressed as a single number. Appendix 5.2 provides summary worksheets of the noise levels for each hour as well as the minimum, maximum, L_1, L_2, L_5, L_8, L_{25}, L_{50}, L_{90}, L_{95}, and L_{99} percentile noise levels observed during the daytime and nighttime periods.

EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS

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6 TRAFFIC NOISE METHODS AND PROCEDURES

The following section outlines the methods and procedures used to estimate and analyze the future traffic noise environment. Consistent with the State of California Land Use Compatibility Plan (see Exhibit 3-A), all transportation related noise levels are presented in terms of the 24-hour CNEL's.

6.1 FHWA TRAFFIC NOISE PREDICTION MODEL

The expected roadway noise level increases from vehicular traffic were calculated by Urban Crossroads, Inc. using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108. (18) The FHWA Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). In California the national REMELs are substituted with the California Vehicle Noise (Calveno) Emission Levels. (19) Adjustments are then made to the REMEL to account for: the roadway classification (e.g., collector, secondary, major or arterial), the roadway active width (i.e., the distance between the center of the outermost travel lanes on each side of the roadway), the total average daily traffic (ADT), the travel speed, the percentages of automobiles, medium trucks, and heavy trucks in the traffic volume, the roadway grade, the angle of view (e.g., whether the roadway view is blocked), the site conditions ("hard" or "soft" relates to the absorption of the ground, pavement, or landscaping), and the percentage of total ADT which flows each hour throughout a 24-hour period. Research conducted by Caltrans has shown that the use of soft site conditions is appropriate for the application of the FHWA traffic noise prediction model used in this analysis. (20)

6.1.1 OFF-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

Table 6-1 presents the roadway parameters used to assess the Project's off-site transportation noise impacts. Table 6-1 identifies the six off-site study area roadway segments, the distance from the centerline to adjacent land use based on the functional roadway classifications per the City of San Leandro General Plan Circulation Element, and the posted vehicle speeds. The ADT volumes used in this study area presented on Table 6-2 are based on *San Leandro Industrial Traffic Analysis*, prepared by Urban Crossroads, Inc. (21)

- Existing Conditions 2022 (E)
- Existing Conditions plus Project (E+P)
- Opening Year Cumulative (2024) Without Project Conditions (OYC).
- Opening Year Cumulative (2024) With Project Conditions (OYCP).

The ADT volumes vary for each roadway segment based on the existing traffic volumes and the combination of project traffic distributions. This analysis relies on a comparative evaluation of the off-site traffic noise impacts at the boundary of the right-of-way of the receiving adjacent land use, without and with project ADT traffic volumes from the Project traffic study.

TABLE 6-1: OFF-SITE ROADWAY PARAMETERS

ID	Roadway	Segment	Classification[1]	Receiving Land Use[2]	Distance from Centerline to Receiving Land Use (Feet)[3]	Vehicle Speed (mph)
1	Doolittle Dr.	n/o Williams St.	Arterial	Non-Sensitive	40'	40
2	Doolittle Dr.	s/o Williams St.	Arterial	Non-Sensitive	40'	40
3	Williams St.	w/o Doolittle Dr.	Collector	Non-Sensitive	35'	35
4	Williams St.	e/o Doolittle Dr.	Collector	Non-Sensitive	35'	35

[1] City of San Leandro General Plan Circulation Element.
[2] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[3] Distance to receiving land use is based upon the right-of-way distances.

To quantify the off-site noise levels, the Project related truck trips were added to the heavy truck category in the FHWA noise prediction model. The addition of the Project related truck trips increases the percentage of heavy trucks in the vehicle mix. This approach recognizes that the FHWA noise prediction model is significantly influenced by the number of heavy trucks in the vehicle mix.

Table 6-3 provides the time of day (daytime, evening, and nighttime) vehicle splits. The daily Project truck trip-ends were assigned to the individual off-site study area roadway segments based on the Project truck trip distribution percentages documented in the *San Leandro Industrial Traffic Analysis*. Using the Project truck trips in combination with the Project trip distribution, Urban Crossroads, Inc. calculated the number of additional Project truck trips and vehicle mix percentages for each of the study area roadway segments. Table 6-4 shows the traffic flow by vehicle type (vehicle mix) used for all without Project traffic scenarios, and Tables 6-5 to 6-6 show the vehicle mixes used for the with Project traffic scenarios.

TABLE 6-2: AVERAGE DAILY TRAFFIC VOLUMES

ID	Roadway	Segment	Average Daily Traffic Volumes[1]			
			Existing 2022		OYC 2024	
			Without Project	With Project	Without Project	With Project
1	Doolittle Dr.	n/o Williams St.	16,846	17,004	19,589	19,748
2	Doolittle Dr.	s/o Williams St.	15,156	15,265	17,873	17,982
3	Williams St.	w/o Doolittle Dr.	3,776	3,776	3,834	3,834
4	Williams St.	e/o Doolittle Dr.	6,965	7,097	8,373	8,505

[1] San Leandro Industrial Traffic Analysis, Urban Crossroads, Inc.

TABLE 6-3: TIME OF DAY VEHICLE SPLITS

Vehicle Type	Time of Day Splits[1]			Total of Time of Day Splits
	Daytime	Evening	Nighttime	
Autos	77.50%	12.90%	9.60%	100.00%
Medium Trucks	84.80%	4.90%	10.30%	100.00%
Heavy Trucks	86.50%	2.70%	10.80%	100.00%

[1] Typical vehicle mix. Values rounded to the nearest one-hundredth.
"Daytime" = 7:00 a.m. to 7:00 p.m.; "Evening" = 7:00 p.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

TABLE 6-4: WITHOUT PROJECT VEHICLE MIX

Classification	Total % Traffic Flow			Total
	Autos	Medium Trucks	Heavy Trucks	
All Segments	92.20%	2.00%	5.80%	100.00%

Based on an existing vehicle count taken at Doolittle Drive and Willisam Street (San Leandro Industrial Traffic Analysis, Urban Crossroads, Inc.). Vehicle mix percentage values rounded to the nearest one-hundredth.

Due to the added Project truck trips, the increase in Project traffic volumes and the distributions of trucks on the study area road segments, the percentage of autos, medium trucks and heavy trucks will vary for each of the traffic scenarios. This explains why the existing and future traffic volumes and vehicle mixes vary between seemingly identical study area roadway segments.

TABLE 6-5: EXISTING WITH PROJECT VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total[2]
1	Doolittle Dr.	n/o Williams St.	92.21%	1.99%	5.79%	100.00%
2	Doolittle Dr.	s/o Williams St.	92.19%	2.00%	5.81%	100.00%
3	Williams St.	w/o Doolittle Dr.	92.20%	2.00%	5.80%	100.00%
4	Williams St.	e/o Doolittle Dr.	92.35%	1.96%	5.69%	100.00%

[1] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

TABLE 6-6: OYC (2024) WITH PROJECT VEHICLE MIX

ID	Roadway	Segment	With Project[1]			
			Autos	Medium Trucks	Heavy Trucks	Total[2]
1	Doolittle Dr.	n/o Williams St.	92.21%	1.99%	5.79%	100.00%
2	Doolittle Dr.	s/o Williams St.	92.19%	2.00%	5.81%	100.00%
3	Williams St.	w/o Doolittle Dr.	92.20%	2.00%	5.80%	100.00%
4	Williams St.	e/o Doolittle Dr.	92.32%	1.97%	5.71%	100.00%

[1] Total of vehicle mix percentage values rounded to the nearest one-hundredth.

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7 OFF-SITE TRAFFIC NOISE ANALYSIS

To assess the off-site transportation CNEL noise level impacts associated with development of the proposed Project, noise contours were developed based on the *San Leandro Industrial Traffic Analysis* prepared by Urbana Crossroads, Inc. (21) Noise contour boundaries represent the equal levels of noise exposure and are measured in CNEL from the center of the roadway.

7.1 TRAFFIC NOISE CONTOURS

Noise contours were used to assess the Project's incremental traffic-related noise impacts at land uses adjacent to roadways conveying Project traffic. The noise contours represent the distance to noise levels of a constant value and are measured from the center of the roadway for the 70, 65, and 60 dBA noise levels. The noise contours do not consider the effect of any existing noise barriers or topography that may attenuate ambient noise levels. In addition, because the noise contours reflect modeling of vehicular noise on area roadways, they appropriately do not reflect noise contributions from the surrounding stationary noise sources within the Project study area. Tables 7-1 to 7-6 present a summary of the exterior traffic noise levels for each traffic condition. Appendix 7.1 includes the traffic noise level contours worksheets for each traffic condition.

TABLE 7-1: EXISTING WITHOUT PROJECT CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Doolittle Dr.	n/o Williams St.	Non-Sensitive	76.2	103	222	478
2	Doolittle Dr.	s/o Williams St.	Non-Sensitive	75.7	96	207	446
3	Williams St.	w/o Doolittle Dr.	Non-Sensitive	69.0	RW	64	139
4	Williams St.	e/o Doolittle Dr.	Non-Sensitive	71.6	45	97	209

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] The CNEL is calculated at the boundary of the right-of-way of the receiving adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-2: EXISTING WITH PROJECT CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Doolittle Dr.	n/o Williams St.	Non-Sensitive	76.2	104	223	481
2	Doolittle Dr.	s/o Williams St.	Non-Sensitive	75.7	97	208	448
3	Williams St.	w/o Doolittle Dr.	Non-Sensitive	69.0	RW	64	139
4	Williams St.	e/o Doolittle Dr.	Non-Sensitive	71.7	45	97	209

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] The CNEL is calculated at the boundary of the right-of-way of the receiving adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-3: OYC (2024) WITHOUT PROJECT CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Doolittle Dr.	n/o Williams St.	Non-Sensitive	76.8	114	246	529
2	Doolittle Dr.	s/o Williams St.	Non-Sensitive	76.4	107	231	498
3	Williams St.	w/o Doolittle Dr.	Non-Sensitive	69.0	RW	65	140
4	Williams St.	e/o Doolittle Dr.	Non-Sensitive	72.4	51	110	236

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] The CNEL is calculated at the boundary of the right-of-way of the receiving adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

TABLE 7-4: OYC (2024) WITH PROJECT CONTOURS

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[2]	Distance to Contour from Centerline (Feet)		
					70 dBA CNEL	65 dBA CNEL	60 dBA CNEL
1	Doolittle Dr.	n/o Williams St.	Non-Sensitive	76.9	115	247	532
2	Doolittle Dr.	s/o Williams St.	Non-Sensitive	76.5	108	232	500
3	Williams St.	w/o Doolittle Dr.	Non-Sensitive	69.0	RW	65	140
4	Williams St.	e/o Doolittle Dr.	Non-Sensitive	72.4	51	110	237

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] The CNEL is calculated at the boundary of the right-of-way of the receiving adjacent land use.
"RW" = Location of the respective noise contour falls within the right-of-way of the road.

7.2 EXISTING PROJECT TRAFFIC NOISE LEVEL INCREASES

An analysis of existing traffic noise levels plus traffic noise generated by the proposed Project has been included in this report for informational purposes and to fully analyze all the existing traffic scenarios identified in the Traffic Analysis prepared by Urban Crossroads, Inc. However, the analysis of existing off-site traffic noise levels plus traffic noise generated by the proposed Project scenario will not actually occur since the Project would not be fully constructed and operational until Year 2024 conditions. Table 7-1 shows the Existing without Project conditions CNEL noise levels. The Existing without Project exterior noise levels range from 69.0 to 76.2 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-2 shows the Existing with Project conditions ranging from 69.0 to 76.2 dBA CNEL. Table 7-5 shows that the Project off-site traffic noise level increases range from 0.0 to 0.1 dBA CNEL on the study area roadway segments. Based on the significance criteria for off-site traffic noise presented in Table 4-1, land uses adjacent to the study area roadway segments would experience *less than significant* noise level increases on receiving land uses due to the Project-related traffic.

7.3 OYC (2024) TRAFFIC NOISE LEVEL INCREASES

Table 7-3 presents the Opening Year Cumulative (2024) without Project conditions CNEL noise levels. The OYC (2024) without Project exterior noise levels range from 69.0 to 76.8 dBA CNEL, without accounting for any noise attenuation features such as noise barriers or topography. Table 7-4 shows that the OYC (2024) with Project conditions will range from 69.0 to 76.9 dBA CNEL. Table 7-6 shows that the Project off-site traffic noise level increases range from 0.0 to 0.1 dBA CNEL. Based on the significance criteria for off-site traffic noise presented in Table 4-1, land uses adjacent to the study area roadway segments would experience *less than significant* noise level increases on receiving land uses due to the Project-related traffic.

TABLE 7-5: EXISTING WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[1]			Incremental Noise Level Increase Threshold[2]	
				No Project	With Project	Project Addition	Limit	Exceeded?
1	Doolittle Dr.	n/o Williams St.	Non-Sensitive	76.2	76.2	0.0	1.5	No
2	Doolittle Dr.	s/o Williams St.	Non-Sensitive	75.7	75.7	0.0	1.5	No
3	Williams St.	w/o Doolittle Dr.	Non-Sensitive	69.0	69.0	0.0	1.5	No
4	Williams St.	e/o Doolittle Dr.	Non-Sensitive	71.6	71.7	0.1	1.5	No

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the receiving land use.
[3] Does the Project create an incremental noise level increase exceeding the significance criteria (Table 4-1)?

TABLE 7-6: OYC (2024) WITH PROJECT TRAFFIC NOISE LEVEL INCREASES

ID	Road	Segment	Receiving Land Use[1]	CNEL at Receiving Land Use (dBA)[1]			Incremental Noise Level Increase Threshold[2]	
				No Project	With Project	Project Addition	Limit	Exceeded?
1	Doolittle Dr.	n/o Williams St.	Non-Sensitive	76.8	76.9	0.1	1.5	No
2	Doolittle Dr.	s/o Williams St.	Non-Sensitive	76.4	76.5	0.1	1.5	No
3	Williams St.	w/o Doolittle Dr.	Non-Sensitive	69.0	69.0	0.0	1.5	No
4	Williams St.	e/o Doolittle Dr.	Non-Sensitive	72.4	72.4	0.0	1.5	No

[1] Based on a review of existing aerial imagery. Noise sensitive uses limited to existing residential land uses.
[2] The CNEL is calculated at the boundary of the right-of-way of each roadway and the property line of the receiving land use.
[3] Does the Project create an incremental noise level increase exceeding the significance criteria (Table 4-1)?

8 RECEIVER LOCATIONS

To assess the potential for long-term operational and short-term construction noise impacts, the following receiver locations, as shown on Exhibit 8-A, were identified as representative locations for analysis. Sensitive receivers are generally defined as locations where people reside or where the presence of unwanted sound could otherwise adversely affect the use of the land. Noise-sensitive land uses are generally considered to include schools, hospitals, single-family dwellings, mobile home parks, churches, libraries, and recreation areas. Moderately noise-sensitive land uses typically include multi-family dwellings, hotels, motels, dormitories, out-patient clinics, cemeteries, golf courses, country clubs, athletic/tennis clubs, and equestrian clubs. Land uses that are considered relatively insensitive to noise include business, commercial, and professional developments. Land uses that are typically not affected by noise include: industrial, manufacturing, utilities, agriculture, undeveloped land, parking lots, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals.

To describe the potential off-site Project noise levels, four receiver locations in the vicinity of the Project site were identified. All distances are measured from the Project site boundary to the outdoor living areas (e.g., private backyards) or at the building façade, whichever is closer to the Project site. The selection of receiver locations is based on FHWA guidelines and is consistent with additional guidance provided by Caltrans and the FTA, as previously described in Section 5.2. Other sensitive land uses in the Project study area that are located at greater distances than those identified in this noise study will experience lower noise levels than those presented in this report due to the additional attenuation from distance and the shielding of intervening structures. Distance is measured in a straight line from the project boundary to each receiver location.

R1: Location R1 represents existing Alameda County Fire Department Station 10 at 2194 Williams Street, approximately 17 feet east of the Project site. Since there are no private outdoor living areas (backyards) facing the Project site, receiver R1 is placed at the building façade. A 24-hour noise measurement was taken near this location, L1, to describe the existing ambient noise environment.

R2: Location R2 represents the existing noise sensitive residence at 2145 Marina Boulevard, approximately 1,240 feet southeast of the Project site. Receiver R2 is placed in the private outdoor living areas (backyards) facing the Project site. A 24-hour noise measurement was taken near this location, L2, to describe the existing ambient noise environment.

R3: Location R3 represents the existing noise sensitive Doolittle Apartments at 2011 Doolittle Drive # A1, approximately 518 feet south of the Project site. Since there are no private outdoor living areas (backyards) facing the Project site, receiver R3 is placed at the building façade. A 24-hour noise measurement was taken near this location, L3, to describe the existing ambient noise environment.

R4: Location R4 represents the existing noise sensitive residence at 2220 Sitka Street, approximately 345 feet southwest of the Project site. Receiver R4 is placed in the private outdoor living areas (backyards) facing the Project site. A 24-hour noise measurement was taken near this location, L4, to describe the existing ambient noise environment.

EXHIBIT 8-A: RECEIVER LOCATIONS

9 OPERATIONAL NOISE ANALYSIS

This section analyzes the potential stationary-source operational noise impacts at the nearby receiver locations, identified in Section 8, resulting from the operation of the proposed San Leandro Industrial Project. Exhibit 9-A identifies the noise source locations used to assess the operational noise levels.

9.1 OPERATIONAL NOISE SOURCES

This operational noise analysis is intended to describe noise level impacts associated with the expected typical of daytime and nighttime activities at the Project site. To present the potential worst-case noise conditions, this analysis assumes the Project would be operational 24 hours per day, seven days per week. Consistent with similar warehouse and industrial uses, the Project business operations would primarily be conducted within the enclosed buildings, except for traffic movement, parking, as well as loading and unloading of trucks at designated loading bays. The on-site Project-related noise sources are expected to include: loading dock activity, roof-top air conditioning units, trash enclosure activity, parking lot vehicle movements, and truck movements.

9.2 REFERENCE NOISE LEVELS

To estimate the Project operational noise impacts, reference noise level measurements were collected from similar types of activities to represent the noise levels expected with the development of the proposed Project. This section provides a detailed description of the reference noise level measurements shown on Table 9-1 used to estimate the Project operational noise impacts. It is important to note that the following projected noise levels assume the worst-case noise environment with the loading dock activity, roof-top air conditioning units, trash enclosure activity, parking lot vehicle movements, and truck movements all operating at the same time. These sources of noise activity will likely vary throughout the day.

9.2.1 MEASUREMENT PROCEDURES

The reference noise level measurements presented in this section were collected using a Larson Davis LxT Type 1 precisions sound level meter (serial number 01146). The LxT sound level meter was calibrated using a Larson-Davis calibrator, Model CAL 200, was programmed in "slow" mode to record noise levels in "A" weighted form and was located at approximately five feet above the ground elevation for each measurement. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (17)

EXHIBIT 9-A: OPERATIONAL NOISE SOURCE LOCATIONS

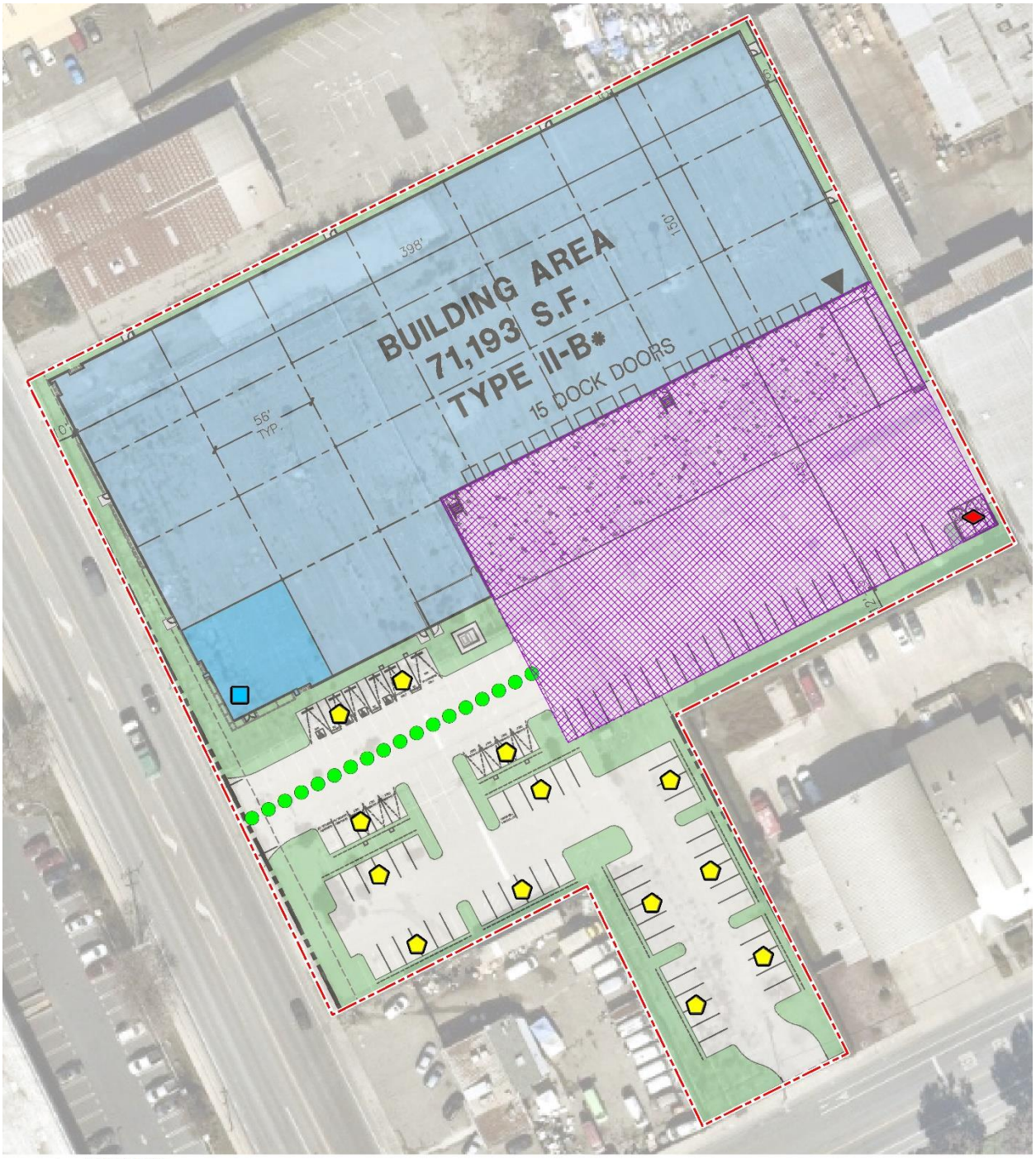

TABLE 9-1: REFERENCE NOISE LEVEL MEASUREMENTS

Noise Source[1]	Noise Source Height (Feet)	Min./ Hour[2]		Reference Noise Level (dBA L_{eq}) @ 50 Feet	Sound Power Level (dBA)[3]
		Day	Night		
Loading Dock Activity	8'	60	60	62.8	103.4
Roof-Top Air Conditioning Units	5'	39	28	57.2	88.9
Trash Enclosure Activity	5'	10	10	57.3	89.0
Parking Lot Vehicle Movements	5'	60	60	56.1	87.8
Truck Movements	8'	60	60	58.0	93.2

[1] As measured by Urban Crossroads, Inc.
[2] Anticipated duration (minutes within the hour) of noise activity during typical hourly conditions expected at the Project site. "Daytime" = 7:00 a.m. - 10:00 p.m.; "Nighttime" = 10:00 p.m. - 7:00 a.m.
[3] Sound power level represents the total amount of acoustical energy (noise level) produced by a sound source independent of distance or surroundings. Sound power levels calculated using the CadnaA noise model at the reference distance to the noise source.

9.2.2 LOADING DOCK ACTIVITY

The reference loading dock activities are intended to describe the typical operational noise source levels associated with the Project. This includes truck idling, deliveries, backup alarms, unloading/loading, docking including a combination of tractor trailer semi-trucks, two-axle delivery trucks, and background forklift operations. At a uniform reference distance of 50 feet, Urban Crossroads collected a reference noise level of 62.8 dBA L_{eq}. The loading dock activity noise level measurement was taken over a fifteen-minute period and represents multiple noise sources taken from the center of activity. The reference noise level measurement includes employees unloading a docked truck container included the squeaking of the truck's shocks when weight was removed from the truck, employees playing music over a radio, as well as a forklift horn and backup alarm. In addition, during the noise level measurement a truck entered the loading dock area and proceeded to reverse and dock in a nearby loading bay, adding truck engine, idling, air brakes noise, in addition to on-going idling of an already docked truck.

The noise level measurements represent the typical weekday dry goods logistics warehouse operation in a single building with a loading dock area on the eastern side of the building façade. In addition, since this reference noise level describes the peak noise source activity, it is also used in the noise prediction model as area source to conservatively describe the entire loading dock area even though during normal operations, the loading dock noise source activity will occur at different locations throughout the loading dock area.

9.2.3 ROOF-TOP AIR CONDITIONING UNITS

The noise level measurements describe a single mechanical roof-top air conditioning unit. The reference noise level represents a Lennox SCA120 series 10-ton model packaged air conditioning unit. At the uniform reference distance of 50 feet, the reference noise levels are 57.2 dBA L_{eq}. Based on the typical operating conditions observed over a four-day measurement period, the roof-top air conditioning units are estimated to operate for and average 39 minutes per hour

during the daytime hours, and 28 minutes per hour during the nighttime hours. These operating conditions reflect peak summer cooling requirements with measured temperatures approaching 96 degrees Fahrenheit (°F) with average daytime temperatures of 82°F. For this noise analysis, the air conditioning units are expected to be located on the roof of the Project buildings.

9.2.5 TRASH ENCLOSURE ACTIVITY

To describe the noise levels associated with a trash enclosure activity, Urban Crossroads collected a reference noise level measurement at an existing trash enclosure containing two dumpster bins. The trash enclosure noise levels describe metal gates opening and closing, metal scraping against concrete floor sounds, dumpster movement on metal wheels, and trash dropping into the metal dumpster. The reference noise levels describe trash enclosure noise activities when trash is dropped into an empty metal dumpster, as would occur at the Project Site. The measured reference noise level at the uniform 50-foot reference distance is 57.3 dBA L_{eq} for the trash enclosure activity. The reference noise level describes the expected noise source activities associated with the trash enclosures for the Project's proposed building. Typical trash enclosure activities are estimated to occur for 10 minutes per hour.

9.2.6 PARKING LOT VEHICLE MOVEMENTS

To describe the on-site parking lot activity, a long-term 29-hour reference noise level measurement was collected in the center of activity within the staff parking lot of a warehouse distribution center. At 50 feet from the center of activity, the parking lot produced a reference noise level of 56.1 dBA L_{eq}. Parking activities are expected to take place during the full hour (60 minutes) throughout the daytime and evening hours. The parking lot noise levels are mainly due cars pulling in and out of parking spaces in combination with car doors opening and closing.

9.2.6 TRUCK MOVEMENTS

The truck movements reference noise level measurement was collected over a period of 1 hour and 28 minutes and represents multiple heavy trucks entering and exiting the outdoor loading dock area producing a reference noise level of 59.8 dBA L_{eq} at 50 feet. The noise sources included at this measurement location account for trucks entering and existing the Project driveways and maneuvering in and out of the outdoor loading dock activity area.

9.3 CADNAA NOISE PREDICTION MODEL

To fully describe the exterior operational noise levels from the Project, Urban Crossroads, Inc. developed a noise prediction model using the CadnaA (Computer Aided Noise Abatement) computer program. CadnaA can analyze multiple types of noise sources using the spatially accurate Project site plan, georeferenced Nearmap aerial imagery, topography, buildings, and barriers in its calculations to predict outdoor noise levels.

Using the ISO 9613-2 protocol, CadnaA will calculate the distance from each noise source to the noise receiver locations, using the ground absorption, distance, and barrier/building attenuation inputs to provide a summary of noise level at each receiver and the partial noise level contributions by noise source. Consistent with the ISO 9613-2 protocol, the CadnaA noise

prediction model relies on the reference sound power level (L_w) to describe individual noise sources. While sound pressure levels (e.g., L_{eq}) quantify in decibels the intensity of given sound sources at a reference distance, sound power levels (L_w) are connected to the sound source and are independent of distance. Sound pressure levels vary substantially with distance from the source and diminish because of intervening obstacles and barriers, air absorption, wind, and other factors. Sound power is the acoustical energy emitted by the sound source and is an absolute value that is not affected by the environment.

The operational noise level calculations provided in this noise study account for the distance attenuation provided due to geometric spreading, when sound from a localized stationary source (i.e., a point source) propagates uniformly outward in a spherical pattern. A default ground attenuation factor of 0.5 was used in the CadnaA noise analysis to account for mixed ground representing a combination of hard and soft surfaces. Appendix 9.1 includes the detailed noise model inputs used to estimate the Project operational noise levels presented in this section.

9.4 PROJECT OPERATIONAL NOISE LEVELS

Using the reference noise levels to represent the proposed Project operations that include loading dock activity, roof-top air conditioning units, trash enclosure activity, parking lot vehicle movements, and truck movements, Urban Crossroads, Inc. calculated the operational source noise levels that are expected to be generated at the Project site and the Project-related noise level increases that would be experienced at each of the receiver locations. Table 9-2 shows the Project operational noise levels during the daytime hours of 7:00 a.m. to 10:00 p.m. The daytime hourly noise levels at the off-site receiver locations are expected to range from 37.5 to 56.7 dBA L_{eq}.

TABLE 9-2: DAYTIME PROJECT OPERATIONAL NOISE LEVELS

Noise Source[1]	Operational Noise Levels by Receiver Location (dBA Leq)			
	R1	R2	R3	R4
Loading Dock Activity	52.7	35.0	41.1	45.0
Roof-Top Air Conditioning Units	33.4	21.8	28.2	33.3
Trash Enclosure Activity	28.5	10.3	15.3	17.3
Parking Lot Vehicle Movements	54.3	32.3	39.0	43.3
Truck Movements	40.6	27.9	34.2	38.6
Total (All Noise Sources)	**56.7**	**37.5**	**43.8**	**48.0**

[1] See Exhibit 9-A for the noise source locations. CadnaA noise model calculations are included in Appendix 9.1.

Table 9-3 shows the Project operational noise levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. The nighttime hourly noise levels at the off-site receiver locations are expected to range from 37.5 to 56.7 dBA L_{eq}. The differences between the daytime and nighttime noise levels are largely related to the estimated duration of noise activity as outlined in Table 9-1 and Appendix 9.1.

TABLE 9-3: NIGHTTIME PROJECT OPERATIONAL NOISE LEVELS

Noise Source[1]	Operational Noise Levels by Receiver Location (dBA Leq)			
	R1	R2	R3	R4
Loading Dock Activity	52.7	35.0	41.1	45.0
Roof-Top Air Conditioning Units	31.0	19.4	25.8	30.9
Trash Enclosure Activity	27.5	9.4	14.3	16.3
Parking Lot Vehicle Movements	54.3	32.3	39.0	43.3
Truck Movements	40.6	27.9	34.2	38.6
Total (All Noise Sources)	**56.7**	**37.5**	**43.8**	**47.9**

[1] See Exhibit 9-A for the noise source locations. CadnaA noise model calculations are included in Appendix 9.1.

9.5 PROJECT OPERATIONAL NOISE LEVEL INCREASES

To describe the Project operational noise level increases, the Project operational noise levels are combined with the existing ambient noise levels measurements for the nearby receiver locations potentially impacted by Project operational noise sources. Since the units used to measure noise, decibels (dB), are logarithmic units, the Project-operational and existing ambient noise levels cannot be combined using standard arithmetic equations. (2) Instead, they must be logarithmically added using the following base equation:

$$SPL_{Total} = 10\log_{10}[10^{SPL1/10} + 10^{SPL2/10} + \ldots 10^{SPLn/10}]$$

Where "SPL1," "SPL2," etc. are equal to the sound pressure levels being combined, or in this case, the Project-operational and existing ambient noise levels. The difference between the combined Project and ambient noise levels describes the Project noise level increases to the existing ambient noise environment. As indicated on Table 9-4, the Project will generate a daytime noise level increase ranging from 0.0 to 2.1 dBA L_{eq} operational noise level increase at the nearest receiver locations. Table 9-5 shows that the Project will generate a nighttime operational noise level increase ranging from 0.0 to 4.4 dBA L_{eq} at the nearest receiver locations.

The Project-related operational noise level increases will satisfy the operational noise level increase significance criteria presented in Table 4-1. Therefore, the incremental Project operational noise level increase is considered *less than significant* at all receiver locations.

TABLE 9-4: DAYTIME PROJECT OPERATIONAL NOISE LEVEL INCREASES

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Increase Criteria[7]	Increase Criteria Exceeded?
R1	56.7	L1	58.9	61.0	2.1	5.0	No
R2	37.5	L2	62.7	62.7	0.0	5.0	No
R3	43.8	L3	68.0	68.0	0.0	1.5	No
R4	48.0	L4	66.7	66.8	0.1	1.5	No

[1] See Exhibit 8-A for the receiver locations.
[2] Total Project daytime operational noise levels as shown on Table 9-2.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed daytime ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance increase criteria as shown on Table 4-1.

TABLE 9-5: NIGHTTIME OPERATIONAL NOISE LEVEL INCREASES

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Increase Criteria[7]	Increase Criteria Exceeded?
R1	56.7	L1	54.3	58.7	4.4	5.0	No
R2	37.5	L2	57.9	57.9	0.0	5.0	No
R3	43.8	L3	62.3	62.4	0.1	5.0	No
R4	47.9	L4	63.7	63.8	0.1	5.0	No

[1] See Exhibit 8-A for the receiver locations.
[2] Total Project nighttime operational noise levels as shown on Table 9-3.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed nighttime ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance increase criteria as shown on Table 4-1.

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10 CONSTRUCTION ANALYSIS

This section analyzes potential impacts resulting from the short-term construction activities associated with the development of the Project. Exhibit 10-A shows the construction activity boundaries in relation to the nearest receiver locations previously described in Section 8. Section 4-1-1115[b] of the City of San Leandro Municipal Code prohibits construction work or related activity which is adjacent to or across a street or right-of-way from a residential use, except between the hours of 7:00 a.m. and 7:00 p.m. on weekdays, or between 8:00 a.m. and 7:00 p.m. on Sunday and Saturday. (12)

In addition, since neither the City of San Leandro General Plan or County Code establish numeric maximum acceptable construction source noise levels at potentially affected receivers for CEQA analysis purposes. Therefore, a numerical construction threshold based on Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual is used for analysis of daytime construction impacts. The FTA considers a daytime exterior construction noise level of 80 dBA L_{eq} as a reasonable threshold for noise sensitive residential land use. (8 p. 179).

10.1 CONSTRUCTION NOISE LEVELS

The FTA *Transit Noise and Vibration Impact Assessment Manual* recognizes that construction projects are accomplished in several different stages and outlines the procedures for assessing noise impacts during construction. Each stage has a specific equipment mix, depending on the work to be completed during that stage. As a result of the equipment mix, each stage has its own noise characteristics; some stages have higher continuous noise levels than others, and some have higher impact noise levels than others. The Project construction activities are expected to occur in the following stages:

- Site Preparation
- Grading
- Building Construction
- Paving
- Architectural Coating

10.2 CONSTRUCTION REFERENCE NOISE LEVELS

To describe construction noise activities, this construction noise analysis was prepared using reference construction equipment noise levels from the Federal Highway Administration (FHWA) published the Roadway Construction Noise Model (RCNM), which includes a national database of construction equipment reference noise emission levels. (22) The RCNM equipment database, provides a comprehensive list of the noise generating characteristics for specific types of construction equipment. In addition, the database provides an acoustical usage factor to estimate the fraction of time each piece of construction equipment is operating at full power (i.e., its loudest condition) during a construction operation.

EXHIBIT 10-A: CONSTRUCTION NOISE SOURCE LOCATIONS

10.3 CONSTRUCTION NOISE ANALYSIS

Using the reference construction equipment noise levels and the CadnaA noise prediction model, calculations of the Project construction noise level impacts at the nearby receiver locations were completed. Consistent with FTA guidance for general construction noise assessment, Table 10-1 presents the combined noise levels for the loudest construction equipment, assuming they operate at the same time. As shown on Table 10-2, the construction noise levels are expected to range from 43.4 to 70.9 dBA L_{eq} at the nearby receiver locations. Appendix 10.1 includes the detailed CadnaA construction noise model inputs.

TABLE 10-1: CONSTRUCTION REFERENCE NOISE LEVELS

Construction Stage	Reference Construction Activity	Reference Noise Level @ 50 Feet (dBA L_{eq})[1]	Combined Noise Level (dBA L_{eq})[2]	Combined Sound Power Level (PWL)[3]
Site Preparation	Crawler Tractors	78	80	112
	Hauling Trucks	72		
	Rubber Tired Dozers	75		
Grading	Graders	81	83	115
	Excavators	77		
	Compactors	76		
Building Construction	Cranes	73	81	113
	Tractors	80		
	Welders	70		
Paving	Pavers	74	83	115
	Paving Equipment	82		
	Rollers	73		
Architectural Coating	Cranes	73	77	109
	Air Compressors	74		
	Generator Sets	70		

[1] FHWA Roadway Construction Noise Model (RCNM).
[2] Represents the combined noise level for all equipment assuming they operate at the same time consistent with FTA Transit Noise and Vibration Impact Assessment guidance.
[3] Sound power level represents the total amount of acoustical energy (noise level) produced by a sound source independent of distance or surroundings. Sound power levels calibrated using the CadnaA noise model at the reference distance to the noise source.

TABLE 10-2: CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})					
	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Levels[2]
R1	67.9	70.9	68.9	70.9	64.9	70.9
R2	46.4	49.4	47.4	49.4	43.4	49.4
R3	52.1	55.1	53.1	55.1	49.1	55.1
R4	55.7	58.7	56.7	58.7	52.7	58.7

[1] Noise receiver locations are shown on Exhibit 10-A.
[2] Construction noise level calculations based on distance from the construction activity, which is measured from the Project site boundary to the nearest receiver locations. CadnaA construction noise model inputs are included in Appendix 10.1.

10.4 CONSTRUCTION NOISE LEVEL COMPLIANCE

To evaluate whether the Project will generate potentially significant short-term noise levels at nearest receiver locations, a construction-related daytime noise level threshold of 80 dBA L_{eq} is used as a reasonable threshold to assess the daytime construction noise level impacts. The construction noise analysis shows that the nearest receiver locations will satisfy the reasonable daytime 80 dBA L_{eq} significance threshold during Project construction activities as shown on Table 10-3. Therefore, the noise impacts due to Project construction noise are considered *less than significant* at all receiver locations.

TABLE 10-3: CONSTRUCTION NOISE LEVEL COMPLIANCE

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})		
	Highest Construction Noise Levels[2]	Threshold[3]	Threshold Exceeded?[4]
R1	70.9	80	No
R2	49.4	80	No
R3	55.1	80	No
R4	58.7	80	No

[1] Noise receiver locations are shown on Exhibit 10-A.
[2] Highest construction noise level calculations based on distance from the construction noise source activity to the nearest receiver locations as shown on Table 10-2.
[3] Construction noise level thresholds as shown on Table 4-1.
[4] Do the estimated Project construction noise levels exceed the construction noise level threshold?

10.5 CONSTRUCTION VIBRATION ANALYSIS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods employed. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Ground vibration levels associated with various types of construction equipment are summarized on Table 10-4. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the potential for human response (annoyance) and

building damage using the following vibration assessment methods defined by the FTA. To describe the vibration impacts the FTA provides the following equation: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$

TABLE 10-4: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	PPV (in/sec) at 25 feet
Small bulldozer	0.003
Jackhammer	0.035
Loaded Trucks	0.076
Large bulldozer	0.089

Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual

Table 10-5 presents the expected Project related vibration levels at the nearby receiver locations. At distances ranging from 17 to 1,240 feet from Project construction activities, construction vibration velocity levels are estimated to range from 0.000 to 0.159 in/sec PPV. Based on maximum acceptable continuous vibration damage threshold of 0.2 PPV (in/sec), the typical Project construction vibration levels will fall below the building damage thresholds at all the noise receiver locations. Therefore, the Project-related vibration impacts are considered *less than significant* during typical construction activities at the Project site.

Moreover, the vibration levels reported at the receiver locations are unlikely to be sustained during the entire construction period but will occur rather only during the times that heavy construction equipment is operating adjacent to the Project site perimeter.

TABLE 10-5: PROJECT CONSTRUCTION VIBRATION LEVELS

Receiver[1]	Distance to Const. Activity (Feet)[2]	Typical Construction Vibration Levels PPV (in/sec)[3]					Thresholds PPV (in/sec)[4]	Thresholds Exceeded?[5]
		Small bulldozer	Jackhammer	Loaded Trucks	Large bulldozer	Highest Vibration Level		
R1	17'	0.005	0.062	0.136	0.159	0.159	0.2	No
R2	1,240'	0.000	0.000	0.000	0.000	0.000	0.2	No
R3	518'	0.000	0.000	0.001	0.001	0.001	0.2	No
R4	345'	0.000	0.001	0.001	0.002	0.002	0.2	No

[1] Receiver locations are shown on Exhibit 10-A.
[2] Distance from receiver location to Project construction boundary (Project site boundary).
[3] Based on the Vibration Source Levels of Construction Equipment (Table 10-4).
[4] Caltrans Transportation and Construction Vibration Manual, April 2020 Table 19.
[5] Does the peak vibration exceed the acceptable vibration thresholds?
"PPV" = Peak Particle Velocity

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11 REFERENCES

1. **State of California.** *California Environmental Quality Act, Environmental Checklist Form Appendix G.* 2021.
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10. **City of San Leandro.** *General Plan 2035.* September 19, 2016.
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15. **California Department of Transportation.** *Technical Noise Supplement.* November 2009.
16. **American National Standards Institute (ANSI).** *Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.*
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18. **California Department of Transportation Environmental Program, Office of Environmental Engineering.** *Use of California Vehicle Noise Reference Energy Mean Emission Levels (Calveno REMELs) in FHWA Highway Traffic Noise Prediction.* September 1995. TAN 95-03.
19. **California Department of Transportation.** *Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report.* June 1995. FHWA/CA/TL-95/23.
20. **Urban Crossroads, Inc.** *San Leandro Industrial.* May 2022.

21. **U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning.** *FHWA Roadway Construction Noise Model.* January, 2006.

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12 CERTIFICATIONS

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed San Leandro Industrial Project. The information contained in this noise study report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 584-3148.

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EDUCATION

Master of Science in Civil and Environmental Engineering
California Polytechnic State University, San Luis Obispo • December, 1993

Bachelor of Science in City and Regional Planning
California Polytechnic State University, San Luis Obispo • June, 1992

PROFESSIONAL REGISTRATIONS

PE – Registered Professional Traffic Engineer – TR 2537 • January, 2009
AICP – American Institute of Certified Planners – 013011 • June, 1997–January 1, 2012
PTP – Professional Transportation Planner • May, 2007 – May, 2013
INCE – Institute of Noise Control Engineering • March, 2004

PROFESSIONAL AFFILIATIONS

ASA – Acoustical Society of America
ITE – Institute of Transportation Engineers

PROFESSIONAL CERTIFICATIONS

Certified Acoustical Consultant – County of San Diego • March, 2018
Certified Acoustical Consultant – County of Orange • February, 2011
FHWA-NHI-142051 Highway Traffic Noise Certificate of Training • February, 2013

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APPENDIX 3.1:

CITY OF SAN LEANDRO MUNICIPAL CODE

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ARTICLE 11. NOISE

4-1-1100 SHORT TITLE.

This Article shall be known and may be cited as the “Noise Ordinance.”

4-1-1105 POLICY AND PURPOSE.

It is hereby declared to be the policy of the City of San Leandro, in the exercise of its police power, to protect the peace, health, safety and general welfare of the citizens of San Leandro from excessive, unnecessary and unreasonable noises from any and all sources in the community. It is the intention of the City Council to control the adverse effect of such noise sources on the citizens by prescribing standards prohibiting detrimental levels of noise and by providing a remedy for violations. The provisions of this Article and the remedies contained in this Code shall be cumulative and are not intended to replace any otherwise available remedies for public or private nuisances, nor any other civil or criminal remedies otherwise available. In addition, the regulations contained herein are not intended to substitute for any noise analysis conducted as a part of the City’s environmental review process for discretionary permit approvals, nor is it intended to limit more strict noise control requirements for discretionary permit approvals should more strict measures be found to be necessary in order to maintain noise levels that are not detrimental to the health and welfare of the citizens of the City.

Among the unacceptable noise sources identified in the City's General Plan are mobile sources such as airplanes, commuter and freight railroads, and highway traffic and other sources which are regulated exclusively by the Federal or the State Government. While in most instances the City may not intervene to address these problems directly, it is the strong policy of the city to work with responsible government agencies and elected officials to reduce the real and damaging effects of these noise-producing activities on the quality of life of the City's residents.

4-1-1110 GENERAL PROHIBITION.

It is unlawful for any person, as defined in Section 1-14-100(h) of this Code, to make, continue, or cause to be made or continued any disturbing, excessive or offensive noise which causes discomfort or annoyance to reasonable persons of normal sensitivity. The factors which should be considered in determining whether a violation of this section exists include the following:

1. The sound level of the objectionable noise.
2. The sound level of the ambient noise.
3. The proximity of the noise to residential property.
4. The zoning of the area.
5. The population density of the area.
6. The time of day or night.
7. The duration of the noise.
8. Whether the noise is recurrent, intermittent, or constant.
9. Whether the noise is produced by an industrial, commercial, or noncommercial activity.
10. Whether the nature of the noise is usual or unusual.

4-1-1115 PROHIBITED ACTS.

It is the intent of this Article to prohibit all disturbing, excessive and offensive noises except those specifically exempted by Section 4-1-1120 and those permitted under an exception permit issued pursuant to Section 4-1-1125. Notwithstanding any other provisions of this Article, the following acts, which are not in any way exclusive, are declared to be disturbing, excessive and offensive noises in violation of Section 4-1-1110:

(a) **Noises by Animals.** The permitting, by any person having charge, care, custody, or control of any animal, of such animal to emit any noise which is disturbing, excessive or offensive. For the purposes

of this subsection, the animal noise shall not be deemed a disturbance if a person is trespassing or threatening to trespass upon private property in or upon which the animal is situated or if the noise is for any other legitimate cause, such as someone teasing or provoking the animal. The scope of this subsection is intended to be and shall be interpreted to be broader than any similar prohibition set forth in Section 4-11-435 of this Title.

(b) **Construction-related Noise Near Residential Uses.** Construction work or related activity which is adjacent to or across a street or right-of-way from a residential use, except between the hours of 7:00 a.m. and 7:00 p.m. on weekdays, or between 8:00 a.m. and 7:00 p.m. on Sunday and Saturday. No such construction is permitted on Federal holidays. As used in this Article, “construction” shall mean any site preparation, assembly, erection, substantial repair, alteration, demolition or similar action, for or on any private property, public or private right-of-way, streets, structures, utilities, facilities, or other similar property. Construction activities carried on in violation of this Article may be enforced as provided in Section 4-11-1130, and may also be enforced by issuance of a stop work order and/or revocation of any or all permits issued for such construction activity.

(c) **Conflicts with Residential Uses.** Subject to the restrictions on constructions contained in subdivision (b), the sustained operation or use between the hours of 9:00 p.m. and 8:00 a.m. of any electric or gasoline powered motor or engine or the repair, modification, reconstruction, testing or operation of any automobile, motorcycle, sweeper, vacuum, public address system, whistle muffler, motorized scooter, machine or mechanical device or other contrivance or facility unless such motor, engine, automobile, motorcycle, sweeper, vacuum, public address system, whistle muffler, motorized scooter, machine or mechanical device is enclosed within a sound insulated structure so as to prevent noise and sound from being plainly audible from any residential property line.

(d) **Loud Music in Parks.** The use of electronic equipment, including but not limited to amplifiers, radio loudspeakers, phonographs, tape amplifiers, electronically operated or acoustic musical instruments or other device of like design used for producing sound in or upon any public street, park or grounds, or any other open area to which the public has access, whether publicly or privately owned, between the hours of 10:00 p.m. and 9:00 a.m. is unlawful. At any other time of day, such equipment may not be used in a manner which disturbs the peace, quiet and comfort of neighboring residents or persons of normal sensitivity who are using such areas. This subsection shall not apply to events for which a permit has been obtained pursuant to Chapter 4-20.

(e) **Music, Stereos and Electronics.**

(1) Operating, playing or permitting the operation or playing of any radio, television set, audio equipment, drum, musical instrument, or similar device which produces or reproduces sound at any time of day in such a manner as to disturb the peace, quiet and comfort of neighboring residents or persons of normal sensitivity. The operation of any such instrument, audio equipment, television set, machine or similar device between the hours of 10:00 p.m. and 8:00 a.m. in such manner as to be plainly audible at a distance of fifty (50) feet from the building, structure or vehicle in which it is located, shall be prima facie evidence of a violation of this subsection.

(2) The conducting of or carrying on of band or orchestral concerts, rehearsals or practice between the hours of 10:00 p.m. and 8:00 a.m. sufficiently loud as to disturb the peace, quiet or repose of persons of ordinary and normal sensitivity who reside in the immediate vicinity of such band or orchestral concerts or rehearsals or practice.

(3) Using, or operating, or permitting to be used or operated, for any purpose, any loud speaker, loudspeaker system, public address or similar device between the hours of 10:00 p.m. and 8:00 a.m. in such a manner as to disturb the peace, quiet and comfort of neighboring residents or persons of normal sensitivity, except for any noncommercial public speaking, public assembly or other activity for which a permit has been issued pursuant Chapter 4-20 of this Title.

4-1-1120 EXEMPTIONS.

The following activities shall be exempt from the provisions of this Title:

(a) **Emergency Work.** The provisions of this title shall not apply to the emission of sound for the purpose of alerting persons to the existence of an emergency or in the performance of emergency work, and activities involving the execution of the duties of duly authorized governmental personnel and others providing emergency response to the general public, including, but not limited to, sworn peace officers, emergency personnel, utility personnel, and the operation of emergency response vehicles and equipment.

(b) **Entertainment Events.** The provisions of this Article shall not apply to those reasonable sounds emanating from authorized school bands, school athletic and school entertainment events and occasional public and private outdoor or indoor gatherings, public dances, shows, bands, sporting and entertainment events conducted between the hours of 7:00 a.m. and 10:00 p.m., and special events for which a permit has been issued pursuant to Chapter 4-20 of this Title.

(c) **Federal or State Preempted Activities.** The provisions of this Article shall not apply to any other activity the noise level of which is regulated by State or Federal law.

(d) **Maintenance to Residential Property.** The provisions of this Article shall not apply to noise sources associated with maintenance to property used for residential purposes, provided the activities take place between the hours of 8:00 a.m. and 10:00 p.m.

(e) **Public Health, Welfare and Safety Activities.** The provisions of this Article shall not apply to construction maintenance and repair operations conducted by public agencies, franchisees of the City and/or utility companies or their contractors which are deemed necessary to serve the best interests of the public and to protect the public health, welfare and safety, including, but not limited to, trash collection, street sweeping, tree removal, debris and limb removal, removal of downed wires, restoring electrical service, repairing traffic signals, unplugging sewers, vacuuming catch basins, repairing of damaged poles, removal of abandoned vehicles, repairing of water hydrants and mains, gas lines, oil lines, sewers, storm drains, roads, sidewalks, etc.

4-1-1125 EXCEPTIONS.

If an applicant can show to the City Manager or his/her designee that a diligent investigation of available noise abatement techniques indicates that immediate compliance with the requirements of this Article would be impractical or unreasonable, a permit to allow exception from the provisions contained in all or a portion of this chapter may be issued, with appropriate conditions to minimize the public detriment caused by such exceptions. Any such permit shall be of as short duration as possible up to six months, but renewable upon a showing of good cause, and shall be conditioned by a schedule for compliance and details of methods therefor in appropriate cases. Any person aggrieved with the decision of the City Manager or his/her designee may appeal to the City Council pursuant to Article 4 of Chapter 1-12 of this Code.

4-1-1130 ENFORCEMENT.

Any violations of the provisions of this Article are expressly deemed and declared to be a public nuisance, and such violation shall be abated in the manner provided in Chapter 1-12 of this Code.

(Legislative History: Ordinance No. 2003-005, 3/17/03 (Sections 4-1-1100—4-1-1130); Ordinance No. 2011-006, 4/4/11 (Section 4-1-1125))

Contact:

City Clerk: 510-577-3367

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APPENDIX 5.1:

STUDY AREA PHOTOS

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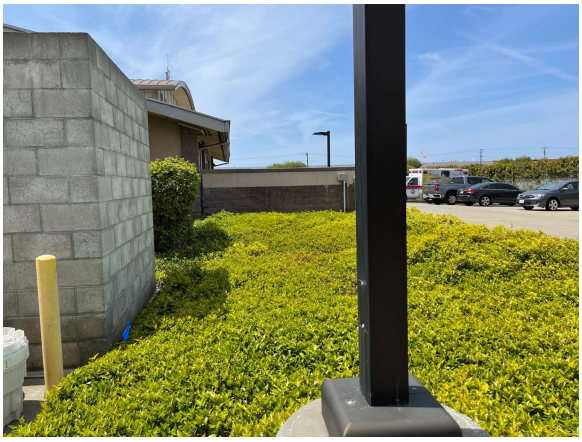
JN: 14593 Study Area Photos

L1_E
37, 42' 33.310000"122, 10' 52.780000"

L1_N
37, 42' 33.250000"122, 10' 52.940000"

L1_S
37, 42' 33.290000"122, 10' 52.860000"



L1_W
37, 42' 33.320000"122, 10' 52.810000"

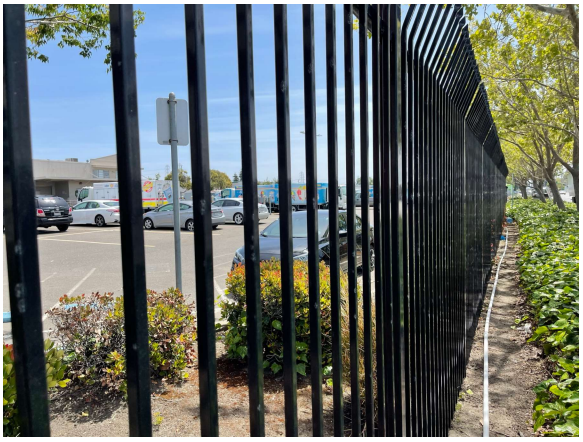
L2_E
37, 42' 22.250000"122, 10' 39.600000"

L2_N
37, 42' 22.260000"122, 10' 39.680000"

JN: 14593 Study Area Photos

L2_S
37, 42' 22.280000"122, 10' 39.650000"

L2_W
37, 42' 22.250000"122, 10' 39.600000"



L3_E
37, 42' 26.780000"122, 10' 54.180000"

L3_N
37, 42' 26.800000"122, 10' 54.180000"

L3_S
37, 42' 26.780000"122, 10' 54.180000"

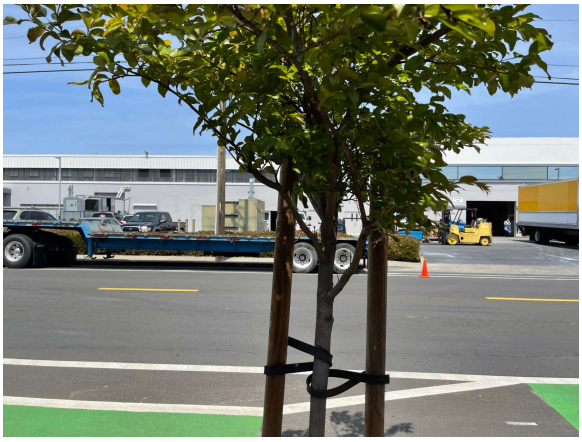
L3_W
37, 42' 26.770000"122, 10' 54.180000"

JN: 14593 Study Area Photos

L4_E
37, 42' 28.320000"122, 10' 59.430000"

L4_N
37, 42' 28.390000"122, 10' 59.430000"

L4_S
37, 42' 28.370000"122, 10' 59.450000"



L4_W
37, 42' 28.370000"122, 10' 59.430000"

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APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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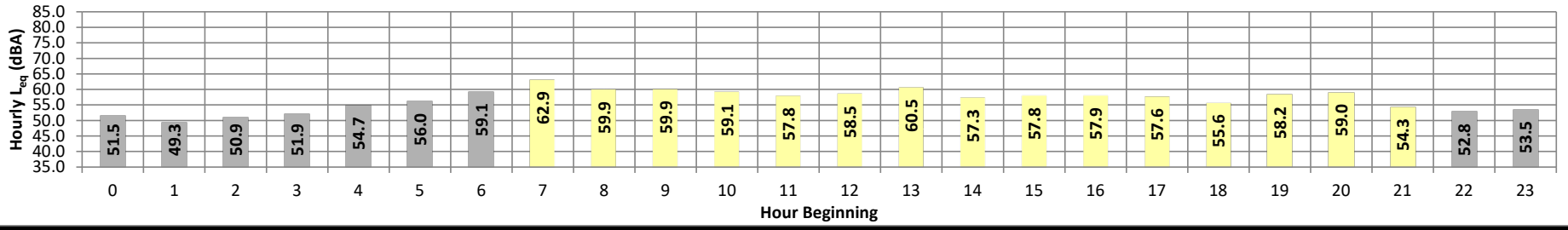
24-Hour Noise Level Measurement Summary

Date: Wednesday, April 27, 2022 *Location:* L1 - Located east of the Project site near Alameda County Fire *Meter:* Piccolo II *JN:* 14593

Project: San Leandro Industrial *Source:* Department Station 10 at 2194 Williams Street. *Analyst:* A. Khan

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	51.5	57.4	47.8	57.1	56.7	55.8	54.9	51.8	50.2	48.4	48.2	47.9	51.5	10.0	61.5
	1	49.3	55.4	45.5	55.1	54.7	53.8	53.2	49.6	47.7	46.0	45.8	45.6	49.3	10.0	59.3
	2	50.9	57.8	46.4	57.4	57.0	55.7	54.8	51.4	49.0	47.1	46.8	46.5	50.9	10.0	60.9
	3	51.9	57.4	47.8	57.2	56.9	56.1	55.4	52.5	50.4	48.4	48.1	47.9	51.9	10.0	61.9
	4	54.7	63.4	49.1	63.0	62.4	60.3	59.2	54.2	52.0	49.8	49.6	49.2	54.7	10.0	64.7
	5	56.0	75.6	51.9	75.5	75.1	74.5	72.0	67.7	62.6	52.7	52.4	52.0	56.0	10.0	66.0
	6	59.1	66.3	54.5	65.9	65.4	64.1	63.0	59.2	57.4	55.4	55.0	54.6	59.1	10.0	69.1
Day	7	62.9	72.2	58.6	71.2	69.9	67.3	65.7	62.7	61.5	59.7	59.2	58.8	62.9	0.0	62.9
	8	59.9	67.1	55.2	66.7	66.2	64.3	63.0	60.2	58.5	56.3	55.8	55.4	59.9	0.0	59.9
	9	59.9	97.5	59.3	97.4	97.2	95.8	95.3	91.8	61.7	59.9	59.8	59.4	59.9	0.0	59.9
	10	59.1	67.9	53.2	67.4	66.8	64.7	63.0	58.9	56.6	54.3	53.8	53.3	59.1	0.0	59.1
	11	57.8	64.4	53.3	64.0	63.5	62.3	61.3	58.2	56.5	54.2	53.8	53.4	57.8	0.0	57.8
	12	58.5	65.9	54.0	65.5	64.9	62.8	61.3	59.0	57.2	54.9	54.5	54.1	58.5	0.0	58.5
	13	60.5	69.0	56.9	68.4	67.3	65.1	63.4	60.2	58.9	57.5	57.3	57.1	60.5	0.0	60.5
	14	57.3	64.4	51.2	64.1	63.6	62.6	61.6	57.6	55.3	52.3	51.7	51.3	57.3	0.0	57.3
	15	57.8	70.4	51.8	69.7	68.7	67.1	66.0	59.9	56.2	53.4	52.6	52.0	57.8	0.0	57.8
	16	57.9	65.6	51.8	65.1	64.4	63.0	61.9	58.2	56.0	53.0	52.5	52.0	57.9	0.0	57.9
	17	57.6	65.9	51.7	65.4	64.8	62.8	61.1	57.7	55.7	52.8	52.3	51.8	57.6	0.0	57.6
	18	55.6	62.3	50.6	61.8	61.3	60.1	59.0	56.1	54.2	51.6	51.1	50.7	55.6	0.0	55.6
	19	58.2	67.8	52.0	67.3	66.3	63.5	62.1	57.8	55.6	53.2	52.7	52.2	58.2	5.0	63.2
	20	59.0	69.1	51.3	68.7	67.9	65.9	64.2	57.3	54.6	52.2	51.8	51.4	59.0	5.0	64.0
	21	54.3	59.7	50.2	59.4	59.0	58.1	57.5	54.9	53.4	51.1	50.7	50.3	54.3	5.0	59.3
Night	22	52.8	59.3	48.6	58.9	58.5	57.1	55.9	53.1	51.4	49.4	49.0	48.7	52.8	10.0	62.8
	23	53.5	63.9	46.2	63.5	63.0	60.2	58.3	51.8	49.2	46.8	46.6	46.3	53.5	10.0	63.5

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	54.3	59.7	50.2	59.4	59.0	58.1	57.5	54.9	53.4	51.1	50.7	50.3
	Max	62.9	97.5	59.3	97.4	97.2	95.8	95.3	91.8	61.7	59.9	59.8	59.4
Energy Average		58.9	Average:		68.1	67.5	65.7	64.4	60.7	56.8	54.4	54.0	53.5
Night	Min	49.3	55.4	45.5	55.1	54.7	53.8	53.2	49.6	47.7	46.0	45.8	45.6
	Max	59.1	75.6	54.5	75.5	75.1	74.5	72.0	67.7	62.6	55.4	55.0	54.6
Energy Average		54.3	Average:		61.5	61.1	59.7	58.5	54.6	52.2	49.3	49.1	48.8

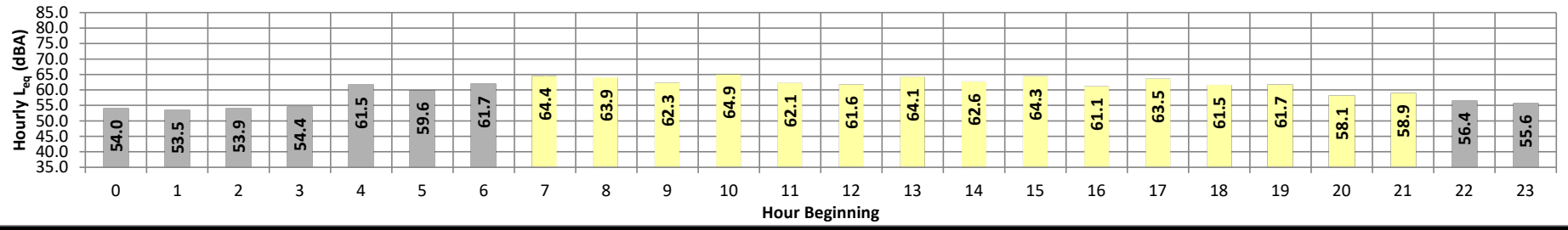
24-Hour	L_{eq} (dBA) Daytime (7am-10pm)	Nighttime (10pm-7am)
57.7	**58.9**	**54.3**

24-Hour Noise Level Measurement Summary

Date: Wednesday, April 27, 2022 *Location:* L2 - Located southeast of the Project site near single-family *Meter:* Piccolo II *JN:* 14593

Project: San Leandro Industrial *Source:* residence at 2021 Marina Boulevard. *Analyst:* A. Khan

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	54.0	63.3	48.4	62.8	62.2	60.3	58.8	53.0	50.9	49.1	48.8	48.5	54.0	10.0	64.0
	1	53.5	63.0	47.9	62.7	62.1	59.9	57.8	52.3	50.0	48.5	48.2	48.0	53.5	10.0	63.5
	2	53.9	62.3	49.2	61.7	61.0	59.3	57.8	53.7	51.5	49.8	49.6	49.3	53.9	10.0	63.9
	3	54.4	62.8	50.1	62.3	61.8	60.0	58.4	54.0	52.0	50.6	50.4	50.1	54.4	10.0	64.4
	4	61.5	70.8	52.5	70.4	70.0	68.6	66.7	61.0	56.9	53.6	53.1	52.6	61.5	10.0	71.5
	5	59.6	69.3	53.1	68.8	68.0	65.8	64.0	59.2	56.4	53.9	53.6	53.2	59.6	10.0	69.6
	6	61.7	73.8	55.4	73.4	72.6	70.1	67.8	62.4	59.7	56.7	56.1	55.6	61.7	10.0	71.7
Day	7	64.4	73.6	55.7	73.0	72.4	70.5	69.5	64.3	60.4	56.8	56.4	55.9	64.4	0.0	64.4
	8	63.9	73.4	55.5	72.8	72.0	69.7	68.1	64.1	61.1	56.9	56.2	55.7	63.9	0.0	63.9
	9	62.3	84.9	53.3	84.3	82.8	78.8	76.0	64.0	59.5	55.1	54.2	53.5	62.3	0.0	62.3
	10	64.9	75.3	54.4	74.7	73.9	71.9	70.2	63.9	60.4	56.1	55.2	54.6	64.9	0.0	64.9
	11	62.1	71.9	53.5	71.3	70.6	68.9	67.1	61.4	58.6	54.7	54.1	53.6	62.1	0.0	62.1
	12	61.6	91.9	67.6	91.5	91.0	88.5	84.0	76.1	72.1	69.1	68.4	67.8	61.6	0.0	61.6
	13	64.1	90.8	55.2	90.3	88.9	83.8	81.6	74.5	60.3	56.6	55.9	55.4	64.1	0.0	64.1
	14	62.6	73.2	52.1	72.3	71.3	69.2	67.8	61.7	59.0	53.9	53.0	52.2	62.6	0.0	62.6
	15	64.3	75.4	52.1	74.8	73.8	71.4	69.7	62.4	58.2	53.5	52.9	52.3	64.3	0.0	64.3
	16	61.1	70.2	52.0	69.7	69.2	67.9	66.2	60.7	58.1	53.7	53.0	52.2	61.1	0.0	61.1
	17	63.5	73.6	52.5	72.6	71.8	70.5	69.2	62.4	58.7	54.2	53.3	52.7	63.5	0.0	63.5
	18	61.5	71.6	51.3	71.3	70.7	68.5	66.4	60.6	57.4	52.8	52.0	51.4	61.5	0.0	61.5
	19	61.7	82.4	52.5	82.1	81.9	80.3	77.7	74.9	61.1	53.8	53.2	52.6	61.7	5.0	66.7
	20	58.1	66.4	50.8	65.9	65.3	63.5	62.2	58.6	55.9	51.9	51.4	50.9	58.1	5.0	63.1
	21	58.9	69.5	50.4	68.7	67.8	65.6	63.6	58.3	54.8	51.3	50.9	50.5	58.9	5.0	63.9
Night	22	56.4	65.5	49.3	65.2	64.6	63.1	61.4	56.2	53.0	49.9	49.7	49.4	56.4	10.0	66.4
	23	55.6	77.8	48.0	76.8	76.3	75.6	74.6	68.4	52.5	48.8	48.5	48.2	55.6	10.0	65.6

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	58.1	66.4	50.4	65.9	65.3	63.5	62.2	58.3	54.8	51.3	50.9	50.5
	Max	64.9	91.9	67.6	91.5	91.0	88.5	84.0	76.1	72.1	69.1	68.4	67.8
Energy Average		62.7	Average:		75.7	74.9	72.6	70.6	64.5	59.7	55.4	54.7	54.1
Night	Min	53.5	62.3	47.9	61.7	61.0	59.3	57.8	52.3	50.0	48.5	48.2	48.0
	Max	61.7	77.8	55.4	76.8	76.3	75.6	74.6	68.4	59.7	56.7	56.1	55.6
Energy Average		57.9	Average:		67.1	66.5	64.8	63.0	57.8	53.7	51.2	50.9	50.5

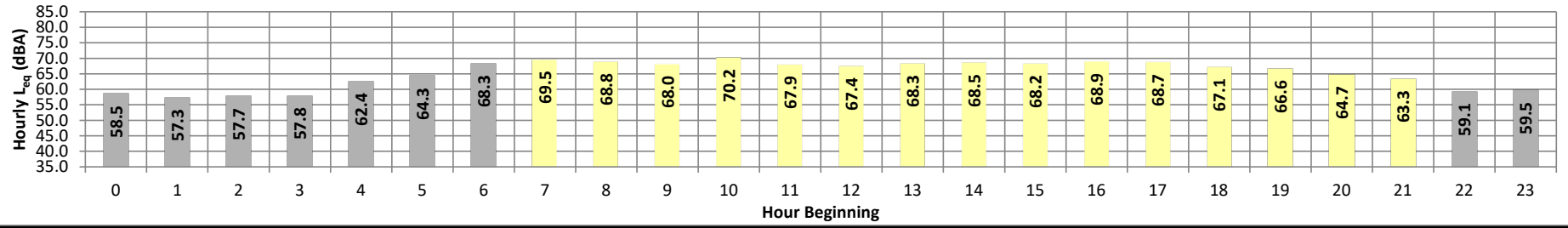
L_{eq} (dBA)		
24-Hour	Daytime (7am-10pm)	Nighttime (10pm-7am)
61.5	**62.7**	**57.9**

24-Hour Noise Level Measurement Summary

Date: Wednesday, April 27, 2022 *Location:* L3 - Located south of the Project site near Doolittle *Meter:* Piccolo II *JN:* 14593

Project: San Leandro Industrial *Source:* Apartments at 2011 Doolittle Drive # A1. *Analyst:* A. Khan

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	58.5	65.2	55.8	64.9	64.6	63.3	61.8	58.2	56.8	56.1	56.0	55.9	58.5	10.0	68.5
	1	57.3	63.0	55.7	62.6	62.2	60.7	59.2	57.1	56.5	56.0	55.9	55.8	57.3	10.0	67.3
	2	57.7	64.8	55.1	64.5	64.2	62.8	60.8	56.9	56.0	55.4	55.3	55.2	57.7	10.0	67.7
	3	57.8	65.3	55.0	64.9	64.6	62.9	61.0	57.5	56.1	55.3	55.2	55.0	57.8	10.0	67.8
	4	62.4	70.0	58.4	69.5	68.9	67.3	66.1	62.5	60.2	58.8	58.7	58.5	62.4	10.0	72.4
	5	64.3	71.9	57.9	71.5	71.0	69.3	68.2	64.9	62.1	59.6	58.5	58.0	64.3	10.0	74.3
	6	68.3	77.5	60.0	77.1	76.5	74.5	72.9	68.4	64.6	60.7	60.4	60.1	68.3	10.0	78.3
Day	7	69.5	80.2	57.8	79.7	78.6	75.7	74.3	69.1	65.5	60.0	58.9	58.0	69.5	0.0	69.5
	8	68.8	78.8	57.5	78.4	77.7	75.3	73.1	68.8	65.3	59.6	58.5	57.7	68.8	0.0	68.8
	9	68.0	78.1	55.2	77.6	76.9	74.2	72.6	68.2	64.1	57.1	56.2	55.4	68.0	0.0	68.0
	10	70.2	82.2	56.4	81.7	80.6	77.0	74.5	68.5	64.5	58.3	57.4	56.7	70.2	0.0	70.2
	11	67.9	77.5	56.4	77.1	76.4	73.9	72.4	68.1	64.4	58.3	57.3	56.6	67.9	0.0	67.9
	12	67.4	76.9	57.2	76.3	75.6	73.4	71.8	67.7	64.4	59.2	58.2	57.3	67.4	0.0	67.4
	13	68.3	78.7	57.9	78.2	77.2	74.3	72.4	68.2	65.0	59.5	58.7	58.0	68.3	0.0	68.3
	14	68.5	79.3	57.7	78.6	77.5	74.6	72.7	68.4	64.9	59.1	58.4	57.8	68.5	0.0	68.5
	15	68.2	78.7	57.2	78.1	77.0	74.1	72.3	68.2	64.8	59.1	58.1	57.4	68.2	0.0	68.2
	16	68.9	79.3	57.6	78.9	78.1	75.6	73.6	68.2	65.2	59.4	58.5	57.8	68.9	0.0	68.9
	17	68.7	79.6	57.6	79.1	78.4	75.2	72.8	67.7	64.6	59.1	58.4	57.8	68.7	0.0	68.7
	18	67.1	79.2	56.3	78.5	77.4	73.5	70.9	66.1	62.4	57.5	56.9	56.4	67.1	0.0	67.1
	19	66.6	78.8	56.2	78.2	77.1	73.2	70.5	64.8	61.2	57.1	56.7	56.3	66.6	5.0	71.6
	20	64.7	75.7	56.1	75.1	74.2	71.1	68.9	64.0	60.3	56.9	56.6	56.2	64.7	5.0	69.7
	21	63.3	74.8	55.9	73.9	72.8	69.8	67.3	62.3	58.9	56.5	56.3	56.0	63.3	5.0	68.3
Night	22	59.1	66.6	56.1	66.2	65.7	64.1	62.3	58.8	57.4	56.5	56.3	56.2	59.1	10.0	69.1
	23	59.5	68.5	56.0	68.0	67.4	65.2	63.1	58.6	57.1	56.3	56.2	56.1	59.5	10.0	69.5

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	63.3	74.8	55.2	73.9	72.8	69.8	67.3	62.3	58.9	56.5	56.2	55.4
	Max	70.2	82.2	57.9	81.7	80.6	77.0	74.5	69.1	65.5	60.0	58.9	58.0
Energy Average		68.0	Average:		78.0	77.0	74.1	72.0	67.2	63.7	58.5	57.7	57.0
Night	Min	57.3	63.0	55.0	62.6	62.2	60.7	59.2	56.9	56.0	55.3	55.2	55.0
	Max	68.3	77.5	60.0	77.1	76.5	74.5	72.9	68.4	64.6	60.7	60.4	60.1
Energy Average		62.3	Average:		67.7	67.2	65.6	63.9	60.3	58.5	57.2	57.0	56.8

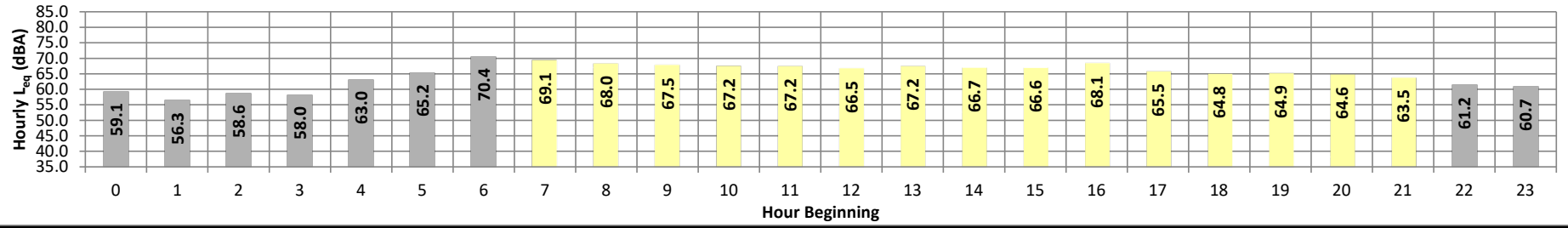
L_{eq} (dBA)		
24-Hour	Daytime (7am-10pm)	Nighttime (10pm-7am)
66.6	**68.0**	**62.3**

24-Hour Noise Level Measurement Summary

Date: Wednesday, April 27, 2022 | *Location:* L4 - Located west of the Project site near single-family residence at 2232 Sitka Street. | *Meter:* Piccolo II | *JN:* 14593

Project: San Leandro Industrial | *Source:* | *Analyst:* A. Khan

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	59.1	70.3	52.5	69.9	69.3	66.6	63.4	56.0	54.2	53.0	52.8	52.6	59.1	10.0	69.1
	1	56.3	65.8	52.3	65.4	64.8	62.1	59.5	54.9	53.7	52.7	52.6	52.4	56.3	10.0	66.3
	2	58.6	68.7	52.9	68.3	67.6	65.6	63.7	56.7	54.6	53.4	53.2	53.0	58.6	10.0	68.6
	3	58.0	67.6	53.4	67.2	66.7	64.4	62.1	56.4	54.9	53.9	53.7	53.5	58.0	10.0	68.0
	4	63.0	74.5	54.3	74.1	73.6	70.6	67.7	60.3	56.9	55.0	54.8	54.5	63.0	10.0	73.0
	5	65.2	76.3	56.5	75.9	75.2	72.5	69.8	63.4	59.6	57.3	57.0	56.6	65.2	10.0	75.2
	6	70.4	82.6	58.2	82.0	80.9	78.0	75.5	67.5	63.0	59.1	58.7	58.3	70.4	10.0	80.4
Day	7	69.1	78.8	58.5	78.3	77.6	75.3	73.9	69.6	65.2	60.1	59.3	58.7	69.1	0.0	69.1
	8	68.0	78.5	58.9	78.0	77.1	74.4	72.4	67.7	63.7	60.0	59.5	59.0	68.0	0.0	68.0
	9	67.5	77.9	57.3	77.4	76.8	74.4	72.4	66.8	62.8	58.5	58.0	57.4	67.5	0.0	67.5
	10	67.2	77.7	57.1	77.3	76.6	74.5	72.1	66.3	62.5	58.4	57.8	57.3	67.2	0.0	67.2
	11	67.2	77.5	57.0	77.2	76.4	74.0	72.1	66.3	62.1	58.2	57.7	57.1	67.2	0.0	67.2
	12	66.5	77.9	56.6	77.4	76.4	73.1	70.8	65.2	61.4	57.6	57.1	56.7	66.5	0.0	66.5
	13	67.2	78.9	56.1	78.2	77.3	74.3	72.1	65.4	61.4	57.1	56.6	56.2	67.2	0.0	67.2
	14	66.7	76.9	55.9	76.5	75.8	73.4	71.5	66.1	62.0	57.2	56.6	56.1	66.7	0.0	66.7
	15	66.6	77.2	55.9	76.8	76.1	73.8	71.8	65.5	60.9	57.0	56.5	56.1	66.6	0.0	66.6
	16	68.1	80.0	55.4	79.6	78.7	75.3	72.6	66.1	61.5	56.6	56.1	55.5	68.1	0.0	68.1
	17	65.5	76.1	54.2	75.6	74.9	72.2	70.2	65.1	60.3	55.2	54.7	54.3	65.5	0.0	65.5
	18	64.8	74.7	54.0	74.4	73.8	71.7	70.2	64.3	59.6	54.8	54.4	54.1	64.8	0.0	64.8
	19	64.9	76.3	54.2	75.9	75.1	72.2	69.4	63.4	58.9	55.1	54.7	54.3	64.9	5.0	69.9
	20	64.6	75.3	55.0	74.9	74.3	71.8	69.4	63.2	58.8	55.8	55.5	55.1	64.6	5.0	69.6
	21	63.5	76.0	54.2	75.5	74.6	70.9	67.4	59.9	57.1	54.9	54.6	54.3	63.5	5.0	68.5
Night	22	61.2	73.3	52.4	72.7	71.7	68.3	65.9	58.5	55.3	53.0	52.7	52.5	61.2	10.0	71.2
	23	60.7	71.6	52.6	71.1	70.5	68.1	65.5	58.6	55.1	53.2	53.0	52.7	60.7	10.0	70.7

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	63.5	74.7	54.0	74.4	73.8	70.9	67.4	59.9	57.1	54.8	54.4	54.1
	Max	69.1	80.0	58.9	79.6	78.7	75.3	73.9	69.6	65.2	60.1	59.5	59.0
Energy Average		66.7	Average:		76.9	76.1	73.4	71.2	65.4	61.2	57.1	56.6	56.1
Night	Min	56.3	65.8	52.3	65.4	64.8	62.1	59.5	54.9	53.7	52.7	52.6	52.4
	Max	70.4	82.6	58.2	82.0	80.9	78.0	75.5	67.5	63.0	59.1	58.7	58.3
Energy Average		63.7	Average:		71.8	71.1	68.5	65.9	59.1	56.4	54.5	54.3	54.0

L_{eq} (dBA)	Daytime (7am-10pm)	Nighttime (10pm-7am)
24-Hour		
65.8	**66.7**	**63.7**

URBAN CROSSROADS

APPENDIX 7.1:

OFF-SITE TRAFFIC NOISE CONTOURS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E
Road Name: Doolittle Dr.
Road Segment: n/o Williams St.
Project Name: San Leandro Industrial
Job Number: 14593

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	16,846 vehicles
Peak Hour Percentage:	9.48%
Peak Hour Volume:	1,597 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	46 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	71.9%	12.2%	15.9%	92.20%
Medium Trucks:	75.3%	7.0%	17.7%	2.00%
Heavy Trucks:	60.4%	12.0%	27.6%	5.80%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	33.106
Medium Trucks:	32.838
Heavy Trucks:	32.864

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	0.35	2.58	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-16.28	2.64	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-11.66	2.63	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.2	66.3	64.6	61.0	68.5	69.0
Medium Trucks:	62.9	61.1	56.8	56.0	63.4	63.7
Heavy Trucks:	72.8	70.0	69.0	67.9	74.6	74.9
Vehicle Noise:	74.4	71.9	70.5	68.9	75.8	76.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	98	211	455	979
CNEL:	103	222	478	1,031

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E+P
Road Name: Doolittle Dr.
Road Segment: n/o Williams St.
Project Name: San Leandro Industrial
Job Number: 14593

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,005 vehicles
Peak Hour Percentage:	9.48%
Peak Hour Volume:	1,612 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	46 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	71.9%	12.2%	15.9%	92.21%
Medium Trucks:	75.3%	7.0%	17.7%	1.99%
Heavy Trucks:	60.4%	12.0%	27.6%	5.79%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	33.106
Medium Trucks:	32.838
Heavy Trucks:	32.864

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	0.40	2.58	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-16.26	2.64	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-11.62	2.63	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.3	66.3	64.6	61.0	68.6	69.0
Medium Trucks:	62.9	61.1	56.8	56.1	63.5	63.7
Heavy Trucks:	72.8	70.1	69.0	67.9	74.7	75.0
Vehicle Noise:	74.4	72.0	70.6	68.9	75.9	76.2

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	98	212	457	985
CNEL:	104	223	481	1,037

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: OYC
Road Name: Doolittle Dr.
Road Segment: n/o Williams St.
Project Name: San Leandro Industrial
Job Number: 14593

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,589 vehicles
Peak Hour Percentage:	9.48%
Peak Hour Volume:	1,857 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	46 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	71.9%	12.2%	15.9%	92.20%
Medium Trucks:	75.3%	7.0%	17.7%	2.00%
Heavy Trucks:	60.4%	12.0%	27.6%	5.80%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	33.106
Medium Trucks:	32.838
Heavy Trucks:	32.864

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	1.01	2.58	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-15.63	2.64	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-11.00	2.63	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.9	66.9	65.2	61.6	69.2	69.6
Medium Trucks:	63.5	61.7	57.4	56.7	64.1	64.3
Heavy Trucks:	73.4	70.7	69.7	68.5	75.3	75.6
Vehicle Noise:	75.1	72.6	71.2	69.6	76.5	76.8

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	108	233	503	1,083
CNEL:	114	246	529	1,140

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: OYCP
Road Name: Doolittle Dr.
Road Segment: n/o Williams St.
Project Name: San Leandro Industrial
Job Number: 14593

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	19,748 vehicles
Peak Hour Percentage:	9.48%
Peak Hour Volume:	1,872 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	46 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	71.9%	12.2%	15.9%	92.21%
Medium Trucks:	75.3%	7.0%	17.7%	1.99%
Heavy Trucks:	60.4%	12.0%	27.6%	5.79%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	33.106
Medium Trucks:	32.838
Heavy Trucks:	32.864

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	1.05	2.58	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-15.61	2.64	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-10.97	2.63	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.9	66.9	65.3	61.6	69.2	69.7
Medium Trucks:	63.5	61.8	57.4	56.7	64.1	64.4
Heavy Trucks:	73.5	70.7	69.7	68.6	75.3	75.6
Vehicle Noise:	75.1	72.6	71.2	69.6	76.5	76.9

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	109	234	505	1,088
CNEL:	115	247	532	1,145

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E
Road Name: Doolittle Dr.
Road Segment: s/o Williams St.
Project Name: San Leandro Industrial
Job Number: 14593

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,156 vehicles
Peak Hour Percentage:	9.48%
Peak Hour Volume:	1,437 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	46 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	71.9%	12.2%	15.9%	92.20%
Medium Trucks:	75.3%	7.0%	17.7%	2.00%
Heavy Trucks:	60.4%	12.0%	27.6%	5.80%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	33.106
Medium Trucks:	32.838
Heavy Trucks:	32.864

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-0.10	2.58	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-16.74	2.64	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-12.12	2.63	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.8	65.8	64.1	60.5	68.1	68.5
Medium Trucks:	62.4	60.6	56.3	55.6	63.0	63.2
Heavy Trucks:	72.3	69.6	68.5	67.4	74.2	74.5
Vehicle Noise:	73.9	71.5	70.1	68.4	75.4	75.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	91	197	424	913
CNEL:	96	207	446	961

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E+P
Road Name: Doolittle Dr.
Road Segment: s/o Williams St.
Project Name: San Leandro Industrial
Job Number: 14593

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	15,265 vehicles
Peak Hour Percentage:	9.48%
Peak Hour Volume:	1,447 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	46 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	71.9%	12.2%	15.9%	92.19%
Medium Trucks:	75.3%	7.0%	17.7%	2.00%
Heavy Trucks:	60.4%	12.0%	27.6%	5.81%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	33.106
Medium Trucks:	32.838
Heavy Trucks:	32.864

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	-0.07	2.58	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-16.71	2.64	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-12.08	2.63	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	67.8	65.8	64.2	60.5	68.1	68.6
Medium Trucks:	62.4	60.6	56.3	55.6	63.0	63.2
Heavy Trucks:	72.3	69.6	68.6	67.4	74.2	74.5
Vehicle Noise:	74.0	71.5	70.1	68.5	75.4	75.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	92	198	426	918
CNEL:	97	208	448	966

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: OYC
Road Name: Doolittle Dr.
Road Segment: s/o Williams St.
Project Name: San Leandro Industrial
Job Number: 14593

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,873 vehicles
Peak Hour Percentage:	9.48%
Peak Hour Volume:	1,694 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	46 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	71.9%	12.2%	15.9%	92.20%
Medium Trucks:	75.3%	7.0%	17.7%	2.00%
Heavy Trucks:	60.4%	12.0%	27.6%	5.80%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	33.106
Medium Trucks:	32.838
Heavy Trucks:	32.864

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	0.61	2.58	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-16.03	2.64	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-11.40	2.63	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.5	66.5	64.8	61.2	68.8	69.2
Medium Trucks:	63.1	61.3	57.0	56.3	63.7	63.9
Heavy Trucks:	73.0	70.3	69.3	68.1	74.9	75.2
Vehicle Noise:	74.7	72.2	70.8	69.2	76.1	76.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	102	219	473	1,019
CNEL:	107	231	498	1,072

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: OYCP
Road Name: Doolittle Dr.
Road Segment: s/o Williams St.
Project Name: San Leandro Industrial
Job Number: 14593

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	17,982 vehicles
Peak Hour Percentage:	9.48%
Peak Hour Volume:	1,705 vehicles
Vehicle Speed:	40 mph
Near/Far Lane Distance:	46 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	40.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	71.9%	12.2%	15.9%	92.19%
Medium Trucks:	75.3%	7.0%	17.7%	2.00%
Heavy Trucks:	60.4%	12.0%	27.6%	5.81%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	33.106
Medium Trucks:	32.838
Heavy Trucks:	32.864

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	66.51	0.64	2.58	-1.20	*-4.59*	0.000	0.000
Medium Trucks:	77.72	-16.00	2.64	-1.20	*-4.87*	0.000	0.000
Heavy Trucks:	82.99	-11.37	2.63	-1.20	*-5.56*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.5	66.5	64.9	61.2	68.8	69.3
Medium Trucks:	63.1	61.4	57.0	56.3	63.7	64.0
Heavy Trucks:	73.1	70.3	69.3	68.2	74.9	75.2
Vehicle Noise:	74.7	72.2	70.8	69.2	76.1	76.5

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	102	221	475	1,024
CNEL:	108	232	500	1,077

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E
Road Name: Williams St.
Road Segment: w/o Doolittle Dr.

Project Name: San Leandro Industrial
Job Number: 14593

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,776 vehicles
Peak Hour Percentage:	9.48%
Peak Hour Volume:	358 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	32 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	35.0 feet
Centerline Dist. to Observer:	35.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	71.9%	12.2%	15.9%	92.20%
Medium Trucks:	75.3%	7.0%	17.7%	2.00%
Heavy Trucks:	60.4%	12.0%	27.6%	5.80%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	31.528
Medium Trucks:	31.246
Heavy Trucks:	31.273

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	-5.56	2.90	-1.20	*-4.54*	0.000	0.000
Medium Trucks:	75.75	-22.20	2.96	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	81.57	-17.57	2.95	-1.20	*-5.65*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.4	58.4	56.8	53.1	60.7	61.2
Medium Trucks:	55.3	53.5	49.2	48.5	55.9	56.1
Heavy Trucks:	65.7	63.0	62.0	60.9	67.6	67.9
Vehicle Noise:	67.2	64.7	63.3	61.7	68.6	69.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	28	61	132	284
CNEL:	30	64	139	299

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E+P
Road Name: Williams St.
Road Segment: w/o Doolittle Dr.

Project Name: San Leandro Industrial
Job Number: 14593

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,776 vehicles
Peak Hour Percentage:	9.48%
Peak Hour Volume:	358 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	32 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	35.0 feet
Centerline Dist. to Observer:	35.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	71.9%	12.2%	15.9%	92.20%
Medium Trucks:	75.3%	7.0%	17.7%	2.00%
Heavy Trucks:	60.4%	12.0%	27.6%	5.80%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	31.528
Medium Trucks:	31.246
Heavy Trucks:	31.273

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	-5.56	2.90	-1.20	*-4.54*	0.000	0.000
Medium Trucks:	75.75	-22.20	2.96	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	81.57	-17.57	2.95	-1.20	*-5.65*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.4	58.4	56.8	53.1	60.7	61.2
Medium Trucks:	55.3	53.5	49.2	48.5	55.9	56.1
Heavy Trucks:	65.7	63.0	62.0	60.9	67.6	67.9
Vehicle Noise:	67.2	64.7	63.3	61.7	68.6	69.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	28	61	132	284
CNEL:	30	64	139	299

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: OYC
Road Name: Williams St.
Road Segment: w/o Doolittle Dr.

Project Name: San Leandro Industrial
Job Number: 14593

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,834 vehicles
Peak Hour Percentage:	9.48%
Peak Hour Volume:	363 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	32 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	35.0 feet
Centerline Dist. to Observer:	35.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	71.9%	12.2%	15.9%	92.20%
Medium Trucks:	75.3%	7.0%	17.7%	2.00%
Heavy Trucks:	60.4%	12.0%	27.6%	5.80%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	31.528
Medium Trucks:	31.246
Heavy Trucks:	31.273

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	-5.49	2.90	-1.20	*-4.54*	0.000	0.000
Medium Trucks:	75.75	-22.13	2.96	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	81.57	-17.51	2.95	-1.20	*-5.65*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.5	58.5	56.8	53.2	60.8	61.2
Medium Trucks:	55.4	53.6	49.3	48.5	55.9	56.2
Heavy Trucks:	65.8	63.1	62.1	60.9	67.7	68.0
Vehicle Noise:	67.2	64.7	63.4	61.8	68.7	69.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	29	62	133	287
CNEL:	30	65	140	302

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: OYCP
Road Name: Williams St.
Road Segment: w/o Doolittle Dr.

Project Name: San Leandro Industrial
Job Number: 14593

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	3,834 vehicles
Peak Hour Percentage:	9.48%
Peak Hour Volume:	363 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	32 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	35.0 feet
Centerline Dist. to Observer:	35.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	71.9%	12.2%	15.9%	92.20%
Medium Trucks:	75.3%	7.0%	17.7%	2.00%
Heavy Trucks:	60.4%	12.0%	27.6%	5.80%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	31.528
Medium Trucks:	31.246
Heavy Trucks:	31.273

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	-5.49	2.90	-1.20	*-4.54*	0.000	0.000
Medium Trucks:	75.75	-22.13	2.96	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	81.57	-17.51	2.95	-1.20	*-5.65*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	60.5	58.5	56.8	53.2	60.8	61.2
Medium Trucks:	55.4	53.6	49.3	48.5	55.9	56.2
Heavy Trucks:	65.8	63.1	62.1	60.9	67.7	68.0
Vehicle Noise:	67.2	64.7	63.4	61.8	68.7	69.0

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	29	62	133	287
CNEL:	30	65	140	302

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E
Road Name: Williams St.
Road Segment: e/o Doolittle Dr.

Project Name: San Leandro Industrial
Job Number: 14593

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	6,965 vehicles
Peak Hour Percentage:	9.48%
Peak Hour Volume:	660 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	32 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	35.0 feet
Centerline Dist. to Observer:	35.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	71.9%	12.2%	15.9%	92.20%
Medium Trucks:	75.3%	7.0%	17.7%	2.00%
Heavy Trucks:	60.4%	12.0%	27.6%	5.80%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	31.528
Medium Trucks:	31.246
Heavy Trucks:	31.273

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	-2.90	2.90	-1.20	*-4.54*	0.000	0.000
Medium Trucks:	75.75	-19.54	2.96	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	81.57	-14.91	2.95	-1.20	*-5.65*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.1	61.1	59.4	55.8	63.4	63.8
Medium Trucks:	58.0	56.2	51.9	51.1	58.5	58.8
Heavy Trucks:	68.4	65.7	64.6	63.5	70.3	70.6
Vehicle Noise:	69.8	67.3	66.0	64.4	71.3	71.6

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	43	92	199	428
CNEL:	45	97	209	450

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: E+P
Road Name: Williams St.
Road Segment: e/o Doolittle Dr.

Project Name: San Leandro Industrial
Job Number: 14593

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	7,097 vehicles
Peak Hour Percentage:	9.48%
Peak Hour Volume:	673 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	32 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	35.0 feet
Centerline Dist. to Observer:	35.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	71.9%	12.2%	15.9%	92.35%
Medium Trucks:	75.3%	7.0%	17.7%	1.96%
Heavy Trucks:	60.4%	12.0%	27.6%	5.69%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	31.528
Medium Trucks:	31.246
Heavy Trucks:	31.273

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	-2.81	2.90	-1.20	*-4.54*	0.000	0.000
Medium Trucks:	75.75	-19.54	2.96	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	81.57	-14.91	2.95	-1.20	*-5.65*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.2	61.2	59.5	55.9	63.5	63.9
Medium Trucks:	58.0	56.2	51.9	51.1	58.5	58.8
Heavy Trucks:	68.4	65.7	64.6	63.5	70.3	70.6
Vehicle Noise:	69.8	67.3	66.0	64.4	71.3	71.7

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	43	92	199	429
CNEL:	45	97	209	451

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: OYC
Road Name: Williams St.
Road Segment: e/o Doolittle Dr.

Project Name: San Leandro Industrial
Job Number: 14593

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,373 vehicles
Peak Hour Percentage:	9.48%
Peak Hour Volume:	794 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	32 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	35.0 feet
Centerline Dist. to Observer:	35.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	71.9%	12.2%	15.9%	92.20%
Medium Trucks:	75.3%	7.0%	17.7%	2.00%
Heavy Trucks:	60.4%	12.0%	27.6%	5.80%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	31.528
Medium Trucks:	31.246
Heavy Trucks:	31.273

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	-2.10	2.90	-1.20	*-4.54*	0.000	0.000
Medium Trucks:	75.75	-18.74	2.96	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	81.57	-14.11	2.95	-1.20	*-5.65*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.9	61.9	60.2	56.6	64.2	64.6
Medium Trucks:	58.8	57.0	52.7	51.9	59.3	59.6
Heavy Trucks:	69.2	66.5	65.4	64.3	71.1	71.4
Vehicle Noise:	70.6	68.1	66.8	65.2	72.1	72.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	48	104	225	484
CNEL:	51	110	236	509

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (9/12/2021)

Scenario: OYCP
Road Name: Williams St.
Road Segment: e/o Doolittle Dr.

Project Name: San Leandro Industrial
Job Number: 14593

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	8,505 vehicles
Peak Hour Percentage:	9.48%
Peak Hour Volume:	806 vehicles
Vehicle Speed:	35 mph
Near/Far Lane Distance:	32 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	35.0 feet
Centerline Dist. to Observer:	35.0 feet
Barrier Distance to Observer:	0.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	0.0 feet
Road Elevation:	0.0 feet
Road Grade:	0.0%
Left View:	-90.0 degrees
Right View:	90.0 degrees

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	71.9%	12.2%	15.9%	92.32%
Medium Trucks:	75.3%	7.0%	17.7%	1.97%
Heavy Trucks:	60.4%	12.0%	27.6%	5.71%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.004	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	31.528
Medium Trucks:	31.246
Heavy Trucks:	31.273

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	64.30	-2.03	2.90	-1.20	*-4.54*	0.000	0.000
Medium Trucks:	75.75	-18.74	2.96	-1.20	*-4.86*	0.000	0.000
Heavy Trucks:	81.57	-14.11	2.95	-1.20	*-5.65*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.0	62.0	60.3	56.7	64.3	64.7
Medium Trucks:	58.8	57.0	52.7	51.9	59.3	59.6
Heavy Trucks:	69.2	66.5	65.4	64.3	71.1	71.4
Vehicle Noise:	70.6	68.1	66.8	65.2	72.1	72.4

Centerline Distance to Noise Contour (in feet)

	70 dBA	*65 dBA*	*60 dBA*	*55 dBA*
Ldn:	48	104	225	485
CNEL:	51	110	237	510

APPENDIX 9.1:

CADNAA OPERATIONAL NOISE MODEL INPUTS

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14593 - San Leandro Industrial

CadnaA Noise Prediction Model: 14593_02.cna
Date: 09.06.22
Analyst: B. Lawson

Calculation Configuration

Configuration	
Parameter	**Value**
General	
Max. Error (dB)	**0.00**
Max. Search Radius (#(Unit,LEN))	**2000.01**
Min. Dist Src to Rcvr	**0.00**
Partition	
Raster Factor	**0.50**
Max. Length of Section (#(Unit,LEN))	**999.99**
Min. Length of Section (#(Unit,LEN))	**1.01**
Min. Length of Section (%)	**0.00**
Proj. Line Sources	**On**
Proj. Area Sources	**On**
Ref. Time	
Reference Time Day (min)	**960.00**
Reference Time Night (min)	**480.00**
Daytime Penalty (dB)	**0.00**
Recr. Time Penalty (dB)	**5.00**
Night-time Penalty (dB)	**10.00**
DTM	
Standard Height (m)	**0.00**
Model of Terrain	**Triangulation**
Reflection	
max. Order of Reflection	**2**
Search Radius Src	**100.00**
Search Radius Rcvr	**100.00**
Max. Distance Source - Rcvr	**1000.00 1000.00**
Min. Distance Rvcr - Reflector	**1.00 1.00**
Min. Distance Source - Reflector	**0.10**
Industrial (ISO 9613)	
Lateral Diffraction	**some Obj**
Obst. within Area Src do not shield	**On**
Screening	**Incl. Ground Att. over Barrier**
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	**3.0 20.0 0.0**
Temperature (#(Unit,TEMP))	**10**
rel. Humidity (%)	**70**
Ground Absorption G	**0.50**
Wind Speed for Dir. (#(Unit,SPEED))	**3.0**
Roads (TNM)	
Railways (FTA/FRA)	
Aircraft (???)	
Strictly acc. to AzB	

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
RECEIVERS		R1	56.7	56.7	63.4	0.0	0.0	0.0				5.00	a	4841534.42	3708110.55	5.00
RECEIVERS		R2	37.5	37.5	44.2	0.0	0.0	0.0				5.00	a	4842039.66	3706854.49	5.00
RECEIVERS		R3	43.8	43.8	50.4	0.0	0.0	0.0				5.00	a	4841433.17	3707451.06	5.00
RECEIVERS		R4	48.0	47.9	54.6	0.0	0.0	0.0				5.00	a	4841212.29	3707758.56	5.00

Point Source(s)

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night			X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(ft)		(ft)	(ft)	(ft)
POINTSOURCE		PARK13	87.8	87.8	87.8	Lw	87.8					5.00	a	4841322.90	3708105.12	5.00
POINTSOURCE		PARK12	87.8	87.8	87.8	Lw	87.8					5.00	a	4841341.40	3708067.45	5.00
POINTSOURCE		PARK11	87.8	87.8	87.8	Lw	87.8					5.00	a	4841398.03	3708094.20	5.00
POINTSOURCE		PARK10	87.8	87.8	87.8	Lw	87.8					5.00	a	4841410.06	3708146.66	5.00
POINTSOURCE		PARK09	87.8	87.8	87.8	Lw	87.8					5.00	a	4841478.39	3708149.00	5.00
POINTSOURCE		PARK08	87.8	87.8	87.8	Lw	87.8					5.00	a	4841466.23	3708084.56	5.00
POINTSOURCE		PARK07	87.8	87.8	87.8	Lw	87.8					5.00	a	4841497.80	3708100.31	5.00
POINTSOURCE		PARK06	87.8	87.8	87.8	Lw	87.8					5.00	a	4841487.40	3708029.81	5.00
POINTSOURCE		PARK05	87.8	87.8	87.8	Lw	87.8					5.00	a	4841523.96	3708054.02	5.00
POINTSOURCE		PARK04	87.8	87.8	87.8	Lw	87.8					5.00	a	4841392.55	3708166.99	5.00
POINTSOURCE		PARK03	87.8	87.8	87.8	Lw	87.8					5.00	a	4841314.34	3708133.41	5.00
POINTSOURCE		PARK02	87.8	87.8	87.8	Lw	87.8					5.00	a	4841305.26	3708190.69	5.00
POINTSOURCE		PARK01	87.8	87.8	87.8	Lw	87.8					5.00	a	4841339.18	3708207.01	5.00
POINTSOURCE		TRASH01	89.0	89.0	89.0	Lw	89.0		150.00	0.00	90.00	5.00	a	4841643.66	3708281.37	5.00

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night			X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(ft)		(ft)	(ft)	(ft)
POINTSOURCE		AC01	88.9	88.9	88.9	Lw	88.9		585.00	0.00	252.00	5.00	g	4841253.12	3708202.37	40.00

Line Source(s)

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Operating Time			Moving Pt. Src				Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	Number			Speed		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	Day	Evening	Night	(mph)	(ft)	
LINESOURCE		TRUCK01	93.2	93.2	93.2	76.0	76.0	76.0	Lw	93.2									8	a

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
LINESOURCE	8.00	a			4841407.74	3708208.18	8.00	0.00
					4841250.77	3708134.54	8.00	0.00

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Operating Time			Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	(ft)	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)		
AREASOURCE		DOCK01	103.4	103.4	103.4	68.0	68.0	68.0	Lw	103.4					8	a

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
AREASOURCE	8.00	a			4841362.85	3708301.96	8.00	0.00
					4841593.66	3708407.81	8.00	0.00
					4841620.19	3708353.85	8.00	0.00
					4841656.14	3708276.89	8.00	0.00
					4841425.31	3708170.70	8.00	0.00
					4841388.43	3708249.37	8.00	0.00

Barrier(s)

Name	M.	ID	Absorption		Z-Ext.	Cantilever		Height				Coordinates			
			left	right		horz.	vert.	Begin		End		x	y	z	Ground
					(ft)	(ft)	(ft)	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
BARRIEREXISTING		0						6.00	a			4841665.00	3708266.92	6.00	0.00
												4841482.69	3708183.26	6.00	0.00
												4841566.35	3708000.94	6.00	0.00

Building(s)

Name	M.	ID	RB	Residents	Absorption	Height		Coordinates			
						Begin		x	y	z	Ground
						(ft)		(ft)	(ft)	(ft)	(ft)
BUILDING		BUILDING00001	x	0		35.00	a	4841158.22	3708372.51	35.00	0.00
								4841529.67	3708542.46	35.00	0.00
								4841593.66	3708407.81	35.00	0.00
								4841362.85	3708301.96	35.00	0.00
								4841388.43	3708249.37	35.00	0.00
								4841290.84	3708205.23	35.00	0.00
								4841289.92	3708207.27	35.00	0.00
								4841249.58	3708188.53	35.00	0.00
								4841233.55	3708221.44	35.00	0.00
								4841231.82	3708219.51	35.00	0.00

APPENDIX 10.1:

CADNAA CONSTRUCTION NOISE MODEL INPUTS

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14593 - San Leandro Industrial

CadnaA Noise Prediction Model: 14593_02 - Construction.cna
Date: 09.06.22
Analyst: B. Lawson

Calculation Configuration

Configuration	
Parameter	**Value**
General	
Max. Error (dB)	**0.00**
Max. Search Radius (#(Unit,LEN))	**2000.01**
Min. Dist Src to Rcvr	**0.00**
Partition	
Raster Factor	**0.50**
Max. Length of Section (#(Unit,LEN))	**999.99**
Min. Length of Section (#(Unit,LEN))	**1.01**
Min. Length of Section (%)	**0.00**
Proj. Line Sources	**On**
Proj. Area Sources	**On**
Ref. Time	
Reference Time Day (min)	**960.00**
Reference Time Night (min)	**480.00**
Daytime Penalty (dB)	**0.00**
Recr. Time Penalty (dB)	**5.00**
Night-time Penalty (dB)	**10.00**
DTM	
Standard Height (m)	**0.00**
Model of Terrain	**Triangulation**
Reflection	
max. Order of Reflection	**2**
Search Radius Src	**100.00**
Search Radius Rcvr	**100.00**
Max. Distance Source - Rcvr	**1000.00 1000.00**
Min. Distance Rvcr - Reflector	**1.00 1.00**
Min. Distance Source - Reflector	**0.10**
Industrial (ISO 9613)	
Lateral Diffraction	**some Obj**
Obst. within Area Src do not shield	**On**
Screening	**Incl. Ground Att. over Barrier**
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	**3.0 20.0 0.0**
Temperature (#(Unit,TEMP))	**10**
rel. Humidity (%)	**70**
Ground Absorption G	**0.50**
Wind Speed for Dir. (#(Unit,SPEED))	**3.0**
Roads (TNM)	
Railways (FTA/FRA)	
Aircraft (???)	
Strictly acc. to AzB	

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height		Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type			X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)		(ft)	(ft)	(ft)
RECEIVERS		R1	70.9	70.9	77.5	80.0	0.0	0.0				5.00	a	4841534.42	3708110.55	5.00
RECEIVERS		R2	49.4	49.4	56.0	80.0	0.0	0.0				5.00	a	4842039.66	3706854.49	5.00
RECEIVERS		R3	55.1	55.1	61.8	80.0	0.0	0.0				5.00	a	4841433.17	3707451.06	5.00
RECEIVERS		R4	58.7	58.7	65.4	80.0	0.0	0.0				5.00	a	4841212.29	3707758.56	5.00

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Operating Time			Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	(ft)	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)		
SITEBOUNDARY		CONSTRUCTION	115.0	115.0	115.0	73.3	73.3	73.3	Lw	115					8	a

Name	Height			Coordinates			
	Begin		End	x	y	z	Ground
	(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
SITEBOUNDARY	8.00	a		4841147.25	3708372.66	8.00	0.00
				4841535.09	3708550.01	8.00	0.00
				4841665.00	3708266.92	8.00	0.00
				4841482.69	3708183.26	8.00	0.00
				4841566.35	3708000.94	8.00	0.00
				4841488.22	3707965.68	8.00	0.00
				4841432.23	3708094.48	8.00	0.00
				4841295.38	3708031.91	8.00	0.00

Barrier(s)

Name	M.	ID	Absorption		Z-Ext.	Cantilever		Height				Coordinates			
			left	right		horz.	vert.	Begin		End		x	y	z	Ground
					(ft)	(ft)	(ft)	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
BARRIEREXISTING		0						6.00	a			4841665.00	3708266.92	6.00	0.00
												4841482.69	3708183.26	6.00	0.00
												4841566.35	3708000.94	6.00	0.00