Appendix H

Noise Impact Assessment,
Collier Commercial Properties

Noise Impact Assessment

Collier Commercial Properties

Lake Elsinore, California

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LIST OF ACRONYMS AND ABBREVIATIONS

Term	Description
City	City of Lake Elsinore
CNEL	Community Noise Equivalent Level
County	Riverside County
dB	Decibel
dBA	Decibel is A-weighted

LIST OF ACRONYMS AND ABBREVIATIONS

Term	**Description**
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
I-15	Interstate 15
ITE	Institute of Transportation Engineers
L_{eq}	Measure of ambient noise
OPR	Office of Planning and Research
OSHA	Federal Occupational Safety and Health Administration
PPV	Peak particle velocity
Project	Collier Commercial Properties Project
RMS	Root mean square

1.0 INTRODUCTION

This report documents the results of a Noise Impact Assessment completed for the Collier Commercial Properties Project (Project), which proposes the construction of two new buildings to accommodate a construction equipment rental facility in Lake Elsinore, California. This assessment was prepared as a comparison of predicted Project noise levels to noise standards promulgated by the City of Lake Elsinore General Plan Public Safety and Welfare Chapter and the City of Lake Elsinore Municipal Code. The purpose of this report is to estimate Project-generated noise levels and to determine the level of impact the Project would have on the environment.

1.1 Project Location and Description

The Project Site is located in the City of Lake Elsinore (City), located in western Riverside County. The irregular shaped site positioned between Collier Avenue and Minthorn Street spans three parcels and totals 2.8 acres. It is currently vacant, undeveloped land and is generally bound by undeveloped land to the north with Collier Avenue and Interstate 15 beyond, Steve's Towing Services to the east with Collier Avenue beyond, West Minthorn Street to the south with a corporation yard beyond, and West Minthorn Street to the west with the City Department of Public Social Services beyond.

The Project is proposing the construction and operation of two new buildings totaling 11,975 square feet to accommodate a construction rental facility with associated features. "Building A" is proposed to span 3,000 square feet and "Building B" would span 8,975 square feet. The Project also proposes to construct 24 parking spaces and a block wall along the southern and western Project Site boundary.

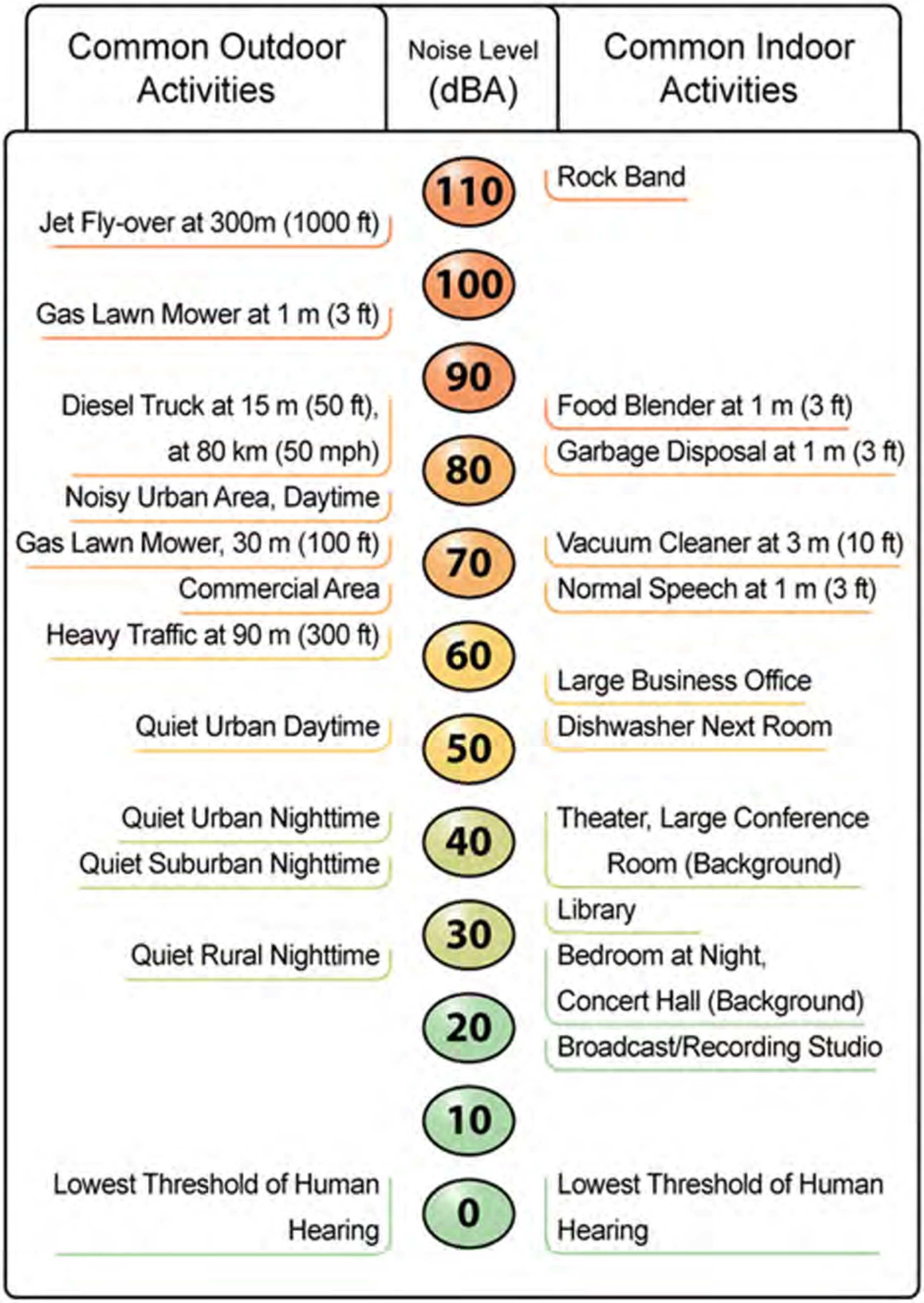
2.0 ENVIRONMENTAL NOISE AND GROUNDBORNE VIBRATION ANALYSIS

2.1 Fundamentals of Noise and Environmental Sound

2.1.1 Addition of Decibels

The decibel (dB) scale is logarithmic, not linear, and therefore sound levels cannot be added or subtracted through ordinary arithmetic. Two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted (dBA), an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70-dBA sound is half as loud as an 80-dBA sound and twice as loud as a 60-dBA sound. When two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be three dB higher than one source under the same conditions (Federal Transit Administration [FTA] 2018). For example, a 65-dB source of sound, such as a truck, when joined by another 65 dB source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by three dB). Under the decibel scale, three sources of equal loudness together would produce an increase of five dB.

Typical noise levels associated with common noise sources are depicted in Figure 2-1.



Source: California Department of Transportation (Caltrans) 2020a

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Figure 2-1. Common Noise Levels

2.1.2 Sound Propagation and Attenuation

Noise can be generated by a number of sources, including mobile sources such as automobiles, trucks and airplanes, and stationary sources such as construction sites, machinery, and industrial operations. Sound spreads (propagates) uniformly outward in a spherical pattern, and the sound level decreases (attenuates) at a rate of approximately six dB for each doubling of distance from a stationary or point source. Sound from a line source, such as a highway, propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of approximately three dB for each doubling of distance from a line source, such as a roadway, depending on ground surface characteristics (Federal Highway Administration [FHWA] 2011). No excess attenuation is assumed for hard surfaces like a parking lot or a body of water. Soft surfaces, such as soft dirt or grass, can absorb sound, so an excess ground-attenuation value of 1.5 dB per doubling of distance is normally assumed. For line sources, an overall attenuation rate of three dB per doubling of distance is assumed (FHWA 2011).

Noise levels may also be reduced by intervening structures; generally, a single row of detached buildings between the receptor and the noise source reduces the noise level by about five dBA (FHWA 2006), while a solid wall or berm generally reduces noise levels by 10 to 20 dBA (FHWA 2011). However, noise barriers or enclosures specifically designed to reduce site-specific construction noise can provide a sound reduction 35 dBA or greater (Western Electro-Acoustic Laboratory, Inc. 2000). To achieve the most potent noise-reducing effect, a noise enclosure/barrier must physically fit in the available space, must completely break the "line of sight" between the noise source and the receptors, must be free of degrading holes or gaps, and must not be flanked by nearby reflective surfaces. Noise barriers must be sizable enough to cover the entire noise source and extend lengthwise and vertically as far as feasibly possible to be most effective. The limiting factor for a noise barrier is not the component of noise transmitted through the material, but rather the amount of noise flanking around and over the barrier. In general, barriers contribute to decreasing noise levels only when the structure breaks the "line of sight" between the source and the receiver.

The manner in which older homes in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows (Caltrans 2002). The exterior-to-interior reduction of newer residential units is generally 30 dBA or more (Harris Miller, Miller & Hanson Inc. 2006). Generally, in exterior noise environments ranging from 60 dBA Community Noise Equivalent Level (CNEL) to 65 dBA CNEL, interior noise levels can typically be maintained below 45 dBA, a typically residential interior noise standard, with the incorporation of an adequate forced air mechanical ventilation system in each residential building, and standard thermal-pane residential windows/doors with a minimum rating of Sound Transmission Class (STC) 28. (STC is an integer rating of how well a building partition attenuates airborne sound. In the U.S., it is widely used to rate interior partitions, ceilings, floors, doors, windows, and exterior wall configurations.) In exterior noise environments of 65 dBA CNEL or greater, a combination of forced-air mechanical ventilation and sound-rated construction methods is often required to meet the interior noise level limit. Attaining the necessary noise reduction from exterior to interior spaces is readily achievable in noise environments less than 75 dBA CNEL with proper wall construction techniques following California Building Code methods, the selections of proper windows and doors, and the incorporation of forced-air mechanical ventilation systems.

2.1.3 Noise Descriptors

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Several rating scales have been developed to analyze the adverse effect of community noise on people. Because environmental noise fluctuates over time, these scales consider that the effect of noise on people is largely dependent on the total acoustical energy content of the noise, as well as the time of day when the noise occurs. The L_{eq} is a measure of ambient noise, while the L_{dn} and CNEL (Community Noise Equivalent Level) are measures of community noise. Each is applicable to this analysis and defined in Table 2-1.

Table 2-1. Common Acoustical Descriptors	
Descriptor	**Definition**
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micropascals (or 20 micronewtons per square meter), where 1 pascal is the pressure resulting from a force of 1 newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micropascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn} or DNL	A 24-hour average L_{eq} with a 10 dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the nighttime. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.4 dBA L_{dn}.
Community Noise Equivalent Level, CNEL	A 24-hour average L_{eq} with a 5 dBA "weighting" during the hours of 7:00 p.m. to 10:00 p.m. and a 10 dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively. The logarithmic effect of these additions is that a 60 dBA 24-hour L_{eq} would result in a measurement of 66.7 dBA CNEL.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.

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

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about ±1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends on the distance between the receptor and the noise source. Close to the noise source, the models are accurate to within about ±1 to 2 dBA.

2.1.4 Human Response to Noise

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

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

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

2.1.5 Effects of Noise on People

2.1.5.1 Hearing Loss

While physical damage to the ear from an intense noise impulse is rare, a degradation of auditory acuity can occur even within a community noise environment. Hearing loss occurs mainly due to chronic exposure to excessive noise but may be due to a single event such as an explosion. Natural hearing loss associated with aging may also be accelerated from chronic exposure to loud noise.

The Occupational Safety and Health Administration (OSHA) has a noise exposure standard that is set at the noise threshold where hearing loss may occur from long-term exposures. The maximum allowable level is 90 dBA averaged over eight hours. If the noise is above 90 dBA, the allowable exposure time is correspondingly shorter.

2.1.5.2 Annoyance

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

2.2 Fundamentals of Environmental Groundborne Vibration

2.2.1 Vibration Sources and Characteristics

Sources of earthborne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or manmade causes (explosions, machinery, traffic, trains, construction equipment, etc.). Vibration sources may be continuous (e.g., factory machinery) or transient (e.g., explosions).

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One is the peak particle velocity (PPV); another is the root mean square (RMS) velocity. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. The RMS velocity is defined as the average of the squared amplitude of the signal. The PPV and RMS vibration velocity amplitudes are used to evaluate human response to vibration.

PPV is generally accepted as the most appropriate descriptor for evaluating the potential for building damage. For human response, however, an average vibration amplitude is more appropriate because it takes time for the human body to respond to the excitation (the human body responds to an average vibration amplitude, not a peak amplitude). Because the average particle velocity over time is zero, the RMS amplitude is typically used to assess human response. The RMS value is the average of the amplitude squared over time, typically a 1- sec. period (FTA 2018).

Table 2-2 displays the reactions of people and the effects on buildings produced by continuous vibration levels. The annoyance levels shown in the table should be interpreted with care since vibration may be found to be annoying at much lower levels than those listed, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. In high-noise environments, which are more prevalent where groundborne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

Ground vibration can be a concern in instances where buildings shake, and substantial rumblings occur. However, it is unusual for vibration from typical urban sources such as buses and heavy trucks to be perceptible. For instance, heavy-duty trucks generally generate groundborne vibration velocity levels of 0.006 PPV at 50 feet under typical circumstances, which as identified in Table 2-2 is considered very unlikely to cause damage to buildings of any type. Common sources for groundborne vibration are planes, trains, and construction activities such as earth-moving which requires the use of heavy-duty earth moving equipment.

Table 2-2. Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibration Levels

Peak Particle Velocity (inches/second)	Approximate Vibration Velocity Level (VdB)	Human Reaction	Effect on Buildings
0.006–0.019	64–74	Range of threshold of perception	Vibrations unlikely to cause damage of any type
0.08	87	Vibrations readily perceptible	Recommended upper level to which ruins and ancient monuments should be subjected
0.1	92	Level at which continuous vibrations may begin to annoy people, particularly those involved in vibration sensitive activities	Virtually no risk of architectural damage to normal buildings
0.2	94	Vibrations may begin to annoy people in buildings	Threshold at which there is a risk of architectural damage to normal dwellings
0.4–0.6	98–104	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Architectural damage and possibly minor structural damage

Source: Caltrans 2020b

3.0 EXISTING ENVIRONMENTAL NOISE SETTING

3.1 Noise Sensitive Land Uses

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as hospitals, historic sites, cemeteries, and certain recreation areas are considered sensitive to increases in exterior noise levels. Schools, churches, hotels, libraries, and other places where low interior noise levels are essential are also considered noise-sensitive land uses.

The nearest existing noise-sensitive land uses to the Project Site is a residential property located approximately 700 feet distant from the northern Project Site boundary, fronting Collier Avenue.

3.2 Existing Ambient Noise Environment

The most common and significant source of noise in the City of Lake Elsinore is mobile noise generated by transportation-related sources. Other sources of noise are the various land uses (i.e., residential and commercial) that generate stationary-source noise. The Project Site is currently undeveloped and bound by Collier Avenue and undeveloped land to the north, Steve's Towing Services to the east, West Minthorn Street and a corporation yard to the south, and West Minthorn Street the City Department of Public Social Services to the west. As shown in Table 3-1 below, the ambient recorded daytime noise levels range from 54.5 to 68.6 dBA L_{eq} near the Project Site.

Interstate 15 (I-15) is located approximately 250 feet east of the Project Site and is a major noise source within the Project Area. Per the California Department of Transportation (Caltrans) traffic counts, the segment of I-15 traversing the Project Area (I-15 between North of Main and State Route 74) accommodates an average daily traffic count of 125,000 vehicles (Caltrans 2021). According to the FHWA Highway Traffic Noise Prediction Model (FHWA-RD-77-108), which calculates the average noise level at specific locations based on traffic volumes, average speeds, roadway geometry, and site environmental conditions; roadway traffic on I-15 generates an ambient noise level of 78.0 dBA L_{dn} at 100 feet from the centerline. Vehicular noise varies with the volume, speed, and type of traffic. Slower traffic produces less noise than fast-moving traffic. Trucks typically generate more noise than cars. Infrequent or intermittent noise also is associated with vehicles including sirens, vehicle alarms, slamming of doors, garbage and construction vehicle activity, and honking of horns. These noises add to urban noise and are regulated by a variety of agencies.

3.2.1 Existing Ambient Noise Measurements

The Project Site is currently undeveloped land surrounded mainly by industrial and commercial land uses. In order to quantify existing ambient noise levels in the Project Area, ECORP Consulting, Inc. conducted three short-term noise measurements on the afternoon of February 3, 2022. These short-term noise measurements are representative of typical existing noise exposure within and immediately adjacent to the Project Site during the daytime (see Attachment A). The 15-minute measurements were taken between 12:05 p.m. and 1:06 p.m. The average noise levels of noise measured at each location are listed in Table 3-1.

Table 3-1. Existing (Baseline) Noise Measurements

Location Number	Location	L_{eq} dBA	L_{min} dBA	L_{max} dBA	Time
1	North shoulder of Collier Avenue adjacent to Project Site.	**67.6 dBA**	59.0 dBA	79.3 dBA	12:50 p.m. – 1:06 p.m.
2	Along walking trail south of storage facility off West Minthorn Street.	**54.5 dBA**	46.1 dBA	64.3 dBA	12:28 p.m. – 12:43 p.m.
3	Along Chaney Avenue.	**68.6 dBA**	49.2 dBA	92.9 dBA	12:05 p.m. – 12:20 p.m.

Source: Measurements were taken by ECORP with a Larson Davis SoundExpert LxT precision sound level meter, which satisfies the American National Standards Institute for general environmental noise measurement instrumentation. Prior to the measurements, the SoundExpert LxT sound level meter was calibrated according to manufacturer specifications with a Larson Davis CAL200 Class I Calibrator. See Attachment A for noise measurement outputs.

Notes: L_{eq} is the average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. L_{min} is the minimum noise level during the measurement period and L_{max} is the maximum noise level during the measurement period.

As shown in Table 3-1, the ambient recorded daytime noise levels range from 54.5 to 68.6 dBA L_{eq} over the course of the three short-term noise measurements taken in the Project vicinity. The most common noise in the Project vicinity is produced by automotive vehicles (e.g., cars, trucks, buses, motorcycles) on area roadways.

4.0 REGULATORY FRAMEWORK

4.1 Federal

4.1.1 Occupational Safety and Health Act of 1970

OSHA regulates onsite noise levels and protects workers from occupational noise exposure. To protect hearing, worker noise exposure is limited to 90 decibels with A-weighting (dBA) over an eight-hour work shift (29 Code of Regulations 1910.95). Employers are required to develop a hearing conservation program when employees are exposed to noise levels exceeding 85 dBA. These programs include provision of hearing protection devices and testing employees for hearing loss on a periodic basis.

4.1.2 U.S. Environmental Protection Agency Office of Noise Abatement and Control

The U.S. Environmental Protection Agency (EPA) Office of Noise Abatement and Control was originally established to coordinate Federal noise control activities. In 1981, USEPA administrators determined that subjective issues such as noise would be better addressed at more local levels of government. Consequently, in 1982 responsibilities for regulating noise control policies were transferred to State and local governments. However, documents and research completed by the EPA Office of Noise Abatement and Control continue to provide value in the analysis of noise effects.

4.1.3 National Institute of Occupational Safety and Health

A division of the US Department of Health and Human Services, the National Institute for Occupational Safety and Health (NIOSH) has established a construction-related noise level threshold as identified in the Criteria for a Recommended Standard: Occupational Noise Exposure prepared in 1998. NIOSH identifies a noise level threshold based on the duration of exposure to the source. The NIOSH construction-related noise level threshold starts at 85 dBA for more than 8 hours per day; for every 3-dBA increase, the exposure time is cut in half. This reduction results in noise level thresholds of 88 dBA for more than 4 hours per day, 92 dBA for more than 1 hour per day, 96 dBA for more than 30 minutes per day, and up to 100 dBA for more than 15 minutes per day. The intention of these thresholds is to protect people from hearing losses resulting from occupational noise exposure.

4.2 State

4.2.1 State of California General Plan Guidelines

The State of California regulates vehicular and freeway noise affecting classrooms, sets standards for sound transmission and occupational noise control, and identifies noise insulation standards and airport noise/land-use compatibility criteria. The State of California General Plan Guidelines (State of California 2003), published by the Governor's Office of Planning and Research (OPR), also provides guidance for the acceptability of projects within specific CNEL/L_{dn} contours. The guidelines also present adjustment factors that may be used in order to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.

4.2.2 State Office of Planning and Research Noise Element Guidelines

The State OPR Noise Element Guidelines include recommended exterior and interior noise level standards for local jurisdictions to identify and prevent the creation of incompatible land uses due to noise. The Noise Element Guidelines contain a land use compatibility table that describes the compatibility of various land uses with a range of environmental noise levels in terms of the CNEL.

4.2.3 California Department of Transportation

In 2020, the California Department of Transportation (Caltrans) published the Transportation and Construction Vibration Manual (Caltrans 2020b). The manual provides general guidance on vibration issues associated with the construction and operation of projects concerning human perception and structural damage. Table 2 presents recommendations for levels of vibration that could result in damage to structures exposed to continuous vibration.

4.3 Local

4.3.1 City of Lake Elsinore General Plan

The Public Safety and Welfare Chapter of the General Plan provides policy direction for minimizing noise impacts on the community and for coordinating with surrounding jurisdictions and other entities regarding noise control. By identifying noise-sensitive land uses and establishing compatibility guidelines for land use and noises, noise considerations will influence the general distribution, location, and intensity of future land uses. The result is that effective land use planning and mitigation can alleviate the majority of noise problems.

The Public Safety and Welfare Chapter contains goals and policies that are intended to achieve the vision of the Public Safety and Welfare Chapter and guide the City's efforts to protect noise sensitive land uses and support the health and serenity of its citizens. The General Plan goals and policies applicable to the Proposed Project are listed below.

- **Goal 7- Maintain and environment for all City residents and visitors free of unhealthy, obtrusive, or otherwise excessive noise.**
  - *Policy 7.1:* Apply the noise standards set forth in the Lake Elsinore Noise and Land Use Compatibility Matrix and Interior and Exterior Noise Standards when considering all new development and redevelopment proposed within the City.

    [*The Proposed Project would be considered "Compatible" at any level below 70 dB L_{dn} and considered "Normally Compatible" at any level 70 dB L_{dn} and above.*]
  - *Policy 7.2:* Require that mixed-use structures and areas being designated to prevent transfer of noise and vibration from commercial areas to residential areas.

4.3.2 City of Lake Elsinore Municipal Code

The City regulations with respect to noise are also included in Chapter 17.176, *Noise Control*, of the City's Municipal Code. Section 17.176.060, *Exterior Noise Limits*, includes exterior noise levels for the receiving land uses and are presented in Table 4-1.

Table 4-1. Exterior Noise Limits

Receiving Land Use Category	Time Period	Noise Level (dBA)
Single Family Residential	10:00 p.m. – 7:00 a.m. 7:00 a.m. – 10:00 p.m.	40 50
Multiple Dwelling Residential	10:00 p.m. – 7:00 a.m. 7:00 a.m. – 10:00 p.m.	45 50
Limited Commercial and Office	10:00 p.m. – 7:00 a.m. 7:00 a.m. – 10:00 p.m.	55 60
General Commercial	10:00 p.m. – 7:00 a.m. 7:00 a.m. – 10:00 p.m.	60 65
Light Industrial	Anytime	70
Heavy Industrial	Anytime	75

Source: City of Lake Elsinore Municipal Code 2021

Additionally, the City's regulations pertaining to construction are included in Section 17.176.080 and presented in Table 4-2.

Table 4-2. Construction Noise Standards			
Residential Properties Mobile Equipment			
Time Period	**Single-Family Residential**	**Multifamily Residential**	**Semi-Residential/Commercial**
7:00 a.m. – 7:00 p.m. (except Sundays and Legal Holidays)	75 dBA	80 dBA	85 dBA
7:00 p.m. – 7:00 a.m. (including Sundays and Legal Holidays)	60 dBA	65 dBA	70 dBA
Residential Properties Stationary Equipment			
Time Period	**Single-Family Residential**	**Multifamily Residential**	**Semi-Residential/Commercial**
7:00 a.m. – 7:00 p.m. (except Sundays and Legal Holidays)	60 dBA	65 dBA	70 dBA
7:00 p.m. – 7:00 a.m. (including Sundays and Legal Holidays)	50 dBA	55 dBA	60 dBA
Commercial Properties Mobile Equipment			
Time Period	**Maximum Noise Level**		
7:00 a.m. – 7:00 p.m. (including Sundays and Legal Holidays)	85 dBA		
Commercial Properties Stationary Equipment			
7:00 a.m. – 7:00 p.m. (including Sundays and Legal Holidays)	75 dBA		

Source: City of Lake Elsinore Municipal Code 2021

5.0 IMPACT ASSESSMENT

5.1 Thresholds of Significance

The impact analysis provided below is based on the following California Environmental Quality Act Guidelines Appendix G thresholds of significance. The Project would result in a significant noise-related impact if it would produce:

1) 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.

2) Generation of excessive groundborne vibration or groundborne noise levels.

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

For purposes of this analysis, the City noise standards were used for evaluation of Project-related noise impacts.

5.2 Methodology

This analysis of the existing and future noise environments is based on noise-prediction modeling. In order to estimate the construction noise levels that may occur at the nearest noise-sensitive receptors in the Project vicinity, predicted construction noise levels were calculated utilizing the FHWA's Roadway Construction Noise Model (2006). For the purposes of a conservative analysis, the estimations of the Roadway Construction Noise Model account for all pieces of equipment being used simultaneously. Groundborne vibration levels associated with construction-related activities for the Project were evaluated utilizing typical groundborne vibration levels associated with construction equipment, obtained from the Caltrans guidelines set forth in Table 2-2 above. Potential groundborne vibration impacts related to structural damage and human annoyance were evaluated, taking into account the distance from construction activities to nearby structures.

An assessment of the Project's impact on the existing noise environment was completed by conducting existing ambient baseline noise measurements around the Project Site with the use of a Larson Davis SoundExpert LxT precision sound level meter, which satisfies the American National Standards Institute standard for general environmental noise measurement instrumentation. Prior to the measurements, the SoundExpert LxT sound level meter was calibrated according to manufacturer specifications with a Larson Davis CAL200 Class I Calibrator. Additionally, onsite stationary source noise levels have been calculated with the SoundPLAN 3D noise model, which predicts noise propagation from a noise source based on the location, noise level, and frequency spectra of the noise sources as well as the geometry and reflective properties of the local terrain, buildings and barriers. The size, location and noise producing level of each source is discussed in detail below. The Project's contribution to roadway noise levels is discussed qualitatively with operational daily trips counts provided by K2 Traffic Engineering, Inc. (2022).

5.3 Impact Analysis

5.3.1 Project Construction Noise

Would the Project Result in Short-Term Construction-Generated Noise in Excess of Standards?

Onsite Construction Noise

Construction noise associated with the Proposed Project would be temporary and would vary depending on the nature of the activities being performed. Noise generated would primarily be associated with the operation of off-road equipment for onsite construction activities as well as construction vehicle traffic on area roadways. Construction noise typically occurs intermittently and varies depending on the nature or phase of construction (e.g., land clearing, grading, excavation, building construction, paving). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. Typical operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. Other primary sources of acoustical disturbance would be random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts). During construction, exterior noise levels could negatively affect sensitive land uses in the vicinity of the construction site.

As previously described in Table 4-2, the City's Municipal Code has mobile and stationary construction noise standards for residential and commercial land uses. It is noted that in the case of the Proposed Project, all phases of construction would employ stationary equipment only, as the city defines mobile equipment standards as nonscheduled, intermittent, short-term operations (less than 10 days) while defining stationary equipment as repetitively scheduled and relatively long-term operation (period of 10 days or more). The Project would require use of stationary equipment through all phases. The nearest residential land use is located to the northwest of the Project Site boundary, fronting Collier Avenue. The nearest commercial land use is Steve's Towing located directly east of the Project Site. It is acknowledged that the majority of construction equipment is not situated at any one location during construction activities, but rather spread throughout the Project Site and at various distances from sensitive receptors. Therefore, this analysis employs the Federal Transit Administration (FTA) guidance for calculating construction noise, which recommends measuring construction noise produced by all construction equipment operating simultaneously from the center of the Project Site (FTA 2018). The anticipated short-term construction noise levels generated for the necessary equipment during each phase for the nearest residential and commercial land uses are summarized in Table 5-1.

Table 5-1. Construction Average (dBA) Noise Levels at Nearest Receptor- Project Site					
Equipment	**Estimated Exterior Construction Noise Level at Nearest Receptor**	**Construction Noise Standards (dBA L_{eq})**		**Exceed Standards?**	
		Daytime	**Nighttime**	**Daytime**	**Nighttime**
Residential Land Use (approximately 820 feet from Project Site Center)					
Site Preparation	**59.5 dBA**	*60 dBA*	*50 dBA*	**No**	**Yes**
Grading	**59.3 dBA**	*60 dBA*	*50 dBA*	**No**	**Yes**
Building Construction, Paving and Painting	**59.6 dBA**	*60 dBA*	*50 dBA*	**No**	**Yes**
Commercial Land Use (approximately 175 feet from Project Site center)					
Site Preparation	**72.9 dBA**	*75 dBA*	-	**No**	**N/A**
Grading	**72.8 dBA**	*75 dBA*	-	**No**	**N/A**
Building Construction, Paving and Painting	**73.1 dBA**	*75 dBA*	-	**No**	**N/A**

Source: Construction noise levels were calculated by ECORP Consulting using the FHWA Roadway Noise Construction Model (FHWA 2006). Refer to Attachment C for Model Data Outputs.

Notes: Construction equipment used during construction derived from the California Emissions Estimator Model (CalEEMod). CalEEMod is designed to calculate air pollutant emissions from construction activity and contains default construction equipment and usage parameters for typical construction projects based on several construction surveys conducted in order to identify such parameters. Consistent with FTA recommendations for calculating construction noise, construction noise was measured from the center of the Project Site (FTA 2018), which is 820 feet from the nearest residential land use and 175 feet from the nearest commercial land use. Construction is considered to be a stationary equipment source, and therefore only stationary equipment thresholds apply.

Construction, paving and painting are assumed to occur simultaneously.

L_{eq} = The equivalent energy noise level, is the average acoustic energy content of noise for a stated period of time. Thus, the L_{eq} of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.

As shown in Table 5-1, construction activities would not exceed the City’s daytime residential standard at the nearest residences, or the City standard for commercial land uses. However, Project construction would exceed the City’s nighttime standard for residential uses. As such the following mitigation is recommended.

Mitigation Measure

NOI-1: **Construction Noise-Reducing Measures**

The Project improvement and building plans will include the following requirements for construction activities:

- Project construction shall be limited to the daytime hours of 7:00 a.m. to 7:00 p.m. Monday through Saturday. All construction on Sundays and legal holidays shall be prohibited.

Implementation of mitigation measure NOI-1 would ensure that City noise standards are not surpassed during Project construction.

Offsite Construction Worker Traffic Noise

Project construction would result in additional traffic on adjacent roadways over the period that construction occurs. According to the California Emissions Estimator Model, which is used to predict the number of worker commute trips, the maximum number of construction workers traveling to and from the Project Site during a single construction phase would not be expected to exceed 23 trips in total (21 construction worker trips and 2 vendor trips). According to the California Department of Transportation (Caltrans) *Technical Noise Supplement to the Traffic Noise Analysis Protocol* (2013), doubling of traffic on a roadway is required to result in an increase of 3 dB (outside of the laboratory, a 3-dBA change is considered a just-perceivable difference). The Project Site is mainly accessible from Collier Avenue. According to the City of Lake Elsinore General Plan Draft Environmental Impact Report (2011b), Collier Avenue is a Major Roadway within the City and has a traffic volume capacity of 34,100 average daily trips. Thus, the Project construction would not result in a doubling of traffic, and therefore its contribution to existing traffic noise would not be perceptible. Additionally, it is noted that construction is temporary, and these trips would cease upon completion of the Project.

5.3.2 Project Operational Noise

Would the Project Result in a Substantial Permanent Increase in Ambient Noise Levels in Excess of City Standards During Operations?

As previously described, noise-sensitive land uses are locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Residences, schools, hospitals, guest lodging, libraries, and some passive recreation areas would each be considered noise-sensitive and may warrant unique measures for protection from intruding noise.

Project Operations

As previously described, noise-sensitive land uses are locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Residences, schools, hospitals, guest lodging, libraries, and some passive recreation areas would each be considered noise-sensitive and may warrant unique measures for protection from intruding noise. The nearest existing noise-sensitive land uses to the Project Site is a residential property located approximately 700 feet distant from the northern Project Site boundary, fronting Collier Avenue.

Operational noise sources associated with the Proposed Project include mobile and stationary (i.e., people talking, car door opening and closing, the loading of equipment, stereo music and internal circulation) sources.

Operational Offsite Traffic Noise

Project operation would also result in additional traffic on adjacent roadways, thereby increasing vehicular noise in the Project vicinity. The Project Site is mainly accessible from Collier Avenue. According to the General Plan Environmental Impact Report (2011b), Collier Avenue is a Major Roadway within the City and has a traffic volume capacity of 34,100 average daily trips. According to the Caltrans *Technical Noise Supplement to the Traffic Noise Analysis Protocol* (2013), doubling of traffic on a roadway would result in an increase of 3 dB (a barely perceptible increase). Per the Trip Generation and VMT Screening Memo prepared by K2 Traffic Engineering, Inc. (2022), the Project is anticipated to generate 119 average daily trips. The Project would not result in a doubling of traffic, thus its contribution to existing traffic noise would not be perceptible.

Operational Onsite Stationary Noise

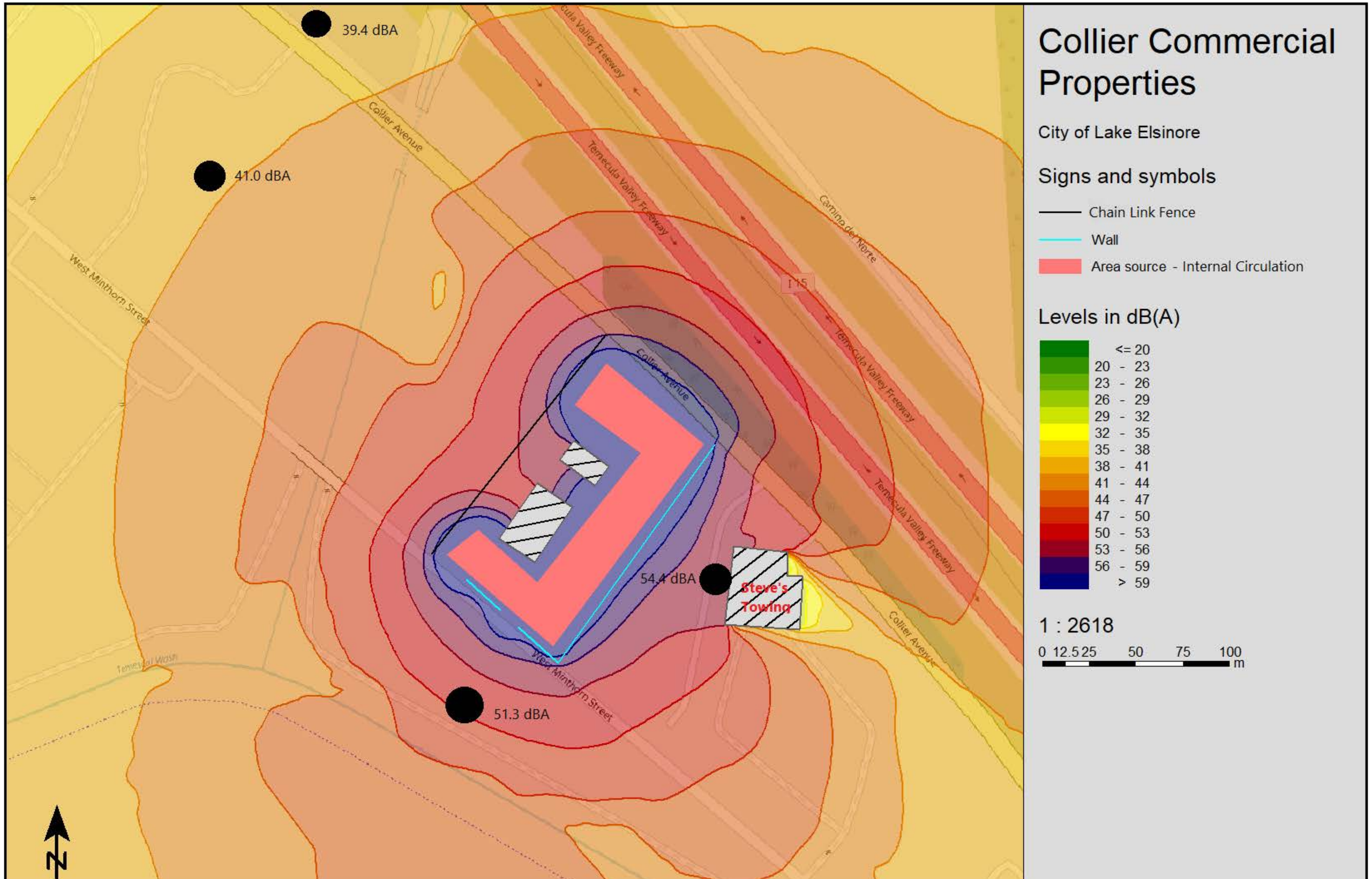
The Project is proposing the development of the Site for an equipment rental facility. The main stationary operational noise associated with the Project would be activities occurring on the Project Site. Such activity would include internal circulation/ parking lot activity (i.e., people talking, car door opening and closing, the loading of equipment, stereo music and internal circulation). On-site Project operations have been calculated using the SoundPLAN 3D noise model. The results of this model can be found in Attachment D. Table 5-2 shows the predicted Project noise levels at four locations in the Project vicinity, as predicted by SoundPLAN. These four locations represent the three nearest commercial/ industrial land uses and nearest residence to the Project Site. Additionally, a noise contour graphic (see Figure 5-1) has been prepared to provide a visual depiction of the predicted noise levels in the Project vicinity from Project operations.

Table 5-2. Modeled Operational Noise Levels

Location	Land Use	Modeled Operational Noise Attributed to Project (L_{eq} dBA)	City Noise Standard Day/Night (L_{eq} dBA)
Residential property north of the Project Site.	Residential	39.4 dBA	*50 dBA / 40 dBA*
Steve's Towing (south of Project Site)	Commercial	54.4 dBA	*65 dBA / 60 dBA*
RightWay Temporary Power (north of Project Site)	Commercial	41.0 dBA	*65 dBA / 60 dBA*
DC Pantry (across West Minthorn Street)	Commercial	51.3 dBA	*65 dBA / 60 dBA*

Source: Stationary source noise levels were modeled by ECORP Consulting using SoundPLAN 3D noise model. Refer to Attachment D for noise modeling assumptions and results.

As shown in Table 5-2, the modeled operational noise levels as a result of operational activities on the Project Site would not exceed the daytime or nighttime noise standards for the commercial/industrial or residential land uses as presented in Table 4-2. Additionally, as shown Table 3-1 above, which depicts existing average noise levels of noise measured in the Project vicinity, the Project Area currently experiences noise levels above those modeled as a result of Project operations. Furthermore, it is noted that the modeled noise levels identified are a conservative scenario. Not all events taking place on the Project Site would generate as much noise as predicted.



Map Date: 4/25/2022
Photo (or Base) Source: *SoundPLAN*

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 5-1. Modeled Operational Noise Levels

2022-020

5.3.3 Project Groundborne Vibration

Would the Project Expose Structures to Substantial Groundborne Vibration During Construction?

Excessive groundborne vibration impacts result from continuously occurring vibration levels. Increases in groundborne vibration levels attributable to the Project would be primarily associated with short-term construction-related activities. Construction on the Project Site would have the potential to result in varying degrees of temporary groundborne vibration, depending on the specific construction equipment used and the operations involved. Ground vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance.

Construction-related ground vibration is normally associated with impact equipment such as pile drivers, jackhammers, and the operation of some heavy-duty construction equipment, such as dozers and trucks. It is noted that pile drivers would not be necessary during Project construction. Vibration decreases rapidly with distance, and it is acknowledged that construction activities would occur throughout the Project Site and would not be concentrated at the point closest to sensitive receptors. Groundborne vibration levels associated with standard construction equipment at 25 feet distant are summarized in Table 5-3.

Table 5-3. Representative Vibration Source Levels for Construction Equipment

Equipment Type	Peak Particle Velocity at 25 Feet (inches per second)
Large Bulldozer	0.089
Caisson Drilling	0.089
Loaded Trucks	0.076
Hoe Ram	0.089
Jackhammer	0.035
Small Bulldozer/Tractor	0.003
Vibratory Roller	0.210

Source: FTA 2018; Caltrans 2020b

The City does not have a numeric threshold associated with construction vibrations. However, a discussion of construction vibration is included for full disclosure purposes. For comparison purposes, the Caltrans (2020b) recommended standard of 0.2 inches per second PPV with respect to the prevention of structural damage for older residential buildings is used as a threshold. This is also the level at which vibrations may begin to annoy people in buildings. Consistent with FTA recommendations for calculating vibration generated from construction equipment, construction vibration was measured from the center of the Project Site (FTA 2018). The nearest structure of concern to the construction site is Steve's Towing located approximately 150 feet south of the Project Site center.

Based on the representative vibration levels presented for various construction equipment types in Table 5-3 and the construction vibration assessment methodology published by the FTA (2018), it is possible to estimate the potential Project construction vibration levels. The FTA provides the following equation:

$$[PPVequip = PPVref \times (25/D)^{1.5}].$$

Table 5-4 presents the expected Project related vibration levels at a distance of 150 feet.

Table 5-4. Onsite Construction Vibration Levels at 150 Feet							
Receiver PPV Levels (in/sec)[1]					Peak Vibration	Threshold	Exceed Threshold
Large Bulldozer, Caisson Drilling, & Hoe Ram	Loaded Trucks	Jackhammer	Small Bulldozer	Vibratory Roller			
0.0060	0.0051	0.0023	0.0002	0.0142	**0.0142**	0.2	**No**

Notes: [1]Based on the Vibration Source Levels of Construction Equipment included on Table 5-3 (FTA 2018). Distance to the nearest structure of concern is approximately 150 feet measured from Project Site center.

As shown in Table 5-4, vibration as a result of onsite construction activities on the Project Site would not exceed 0.2 PPV at the nearest structure. Thus, onsite Project construction would not exceed the recommended threshold.

Would the Project Expose Structures to Substantial Groundborne Vibration During Operations?

Project operations would not include the use of any stationary equipment that would result in excessive vibration levels. Therefore, the Project would not result in groundborne vibration impacts during operations.

5.3.4 Excess Airport Noise

Would the Project Expose People Residing or Working in the Project area to Excessive Airport Noise?

The Project Site is located approximately 8.35 miles northeast of the Perris Valley Airport-L65. According to the City of Perris General Plan Noise Element (2016), the airport is a center for skydiving. Aircraft traffic at the airport typically consist of Twin Otter Turbo Prop, 20-passenger planes equipped with jet engines and propellers. Due to the limited activities occurring at the airport, the lack of commercial flights and distance of more than three miles from the airport to the Site, it can be assumed that those working on the Project Site would not be negatively impacted by airport operations.

6.0 REFERENCES

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LIST OF ATTACHMENTS

ATTACHMENT A

Baseline (Existing) Noise Measurements –Project Vicinity

Site Number: 1
Recorded By: Lindsay Liegler
Job Number: 2022-020
Date: 2/3/2022
Time: 12:50 p.m. – 1:06 p.m.
Location: North shoulder of Collier Avenue adjacent to Project Site.
Source of Peak Noise: Vehicles on Collier Avenue and I-15.

Noise Data			
Leq (dB)	Lmin (dB)	Lmax (dB)	Peak (dB)
67.6	59.0	79.3	103.2

Equipment						
Category	Type	Vendor	Model	Serial No.	Cert. Date	Note
Sound	Sound Level Meter	Larson Davis	LxT SE	0006133	02/24/2021	
	Microphone	Larson Davis	377B02	315201	02/24/2021	
	Preamp	Larson Davis	PRMLxT1L	069947	02/24/2021	
	Calibrator	Larson Davis	CAL200	17325	02/25/2021	

Weather Data			
Est.	Duration: 15 min.		Sky: Clear
	Note: dBA Offset = 0.14		Sensor Height (ft): 3.5
	Wind Ave Speed (mph)	Temperature (degrees Fahrenheit)	Barometer Pressure (hPa)
	8	61	30.20

Photo of Measurement Location

Measurement Report

Report Summary

Meter's File Name	LxT_Data.097.s	Computer's File Name	LxT_0006133-20220203 125049-LxT_Data.097.ldbin
Meter	LxT1 0006133		
Firmware	2.404		
User		Location	
Job Description			
Note			

Start Time	2022-02-03 12:50:49	Duration	0:15:31.0		
End Time	2022-02-03 13:06:20	Run Time	0:15:31.0	Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	67.6 dB		
LAE	97.3 dB	SEA	--- dB
EA	592.1 µPa²h		
EA8	18.3 mPa²h		
EA40	91.6 mPa²h		
LZS_{peak}	103.2 dB	2022-02-03 13:00:07	
LAS_{max}	79.3 dB	2022-02-03 13:06:03	
LAS_{min}	59.0 dB	2022-02-03 12:58:25	
LA_{eq}	67.6 dB		
LC_{eq}	76.8 dB	LC_{eq} - LA_{eq}	9.3 dB
LAI_{eq}	68.6 dB	LAI_{eq} - LA_{eq}	1.0 dB

Exceedances

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

Community Noise

LDN	LDay	LNight	
67.6 dB	67.6 dB	0.0 dB	
LDEN	**LDay**	**LEve**	**LNight**
67.6 dB	67.6 dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	67.6 dB		--- dB		--- dB	
$Ls_{(max)}$	79.3 dB	2022-02-03 13:06:03	--- dB		--- dB	
$LS_{(min)}$	59.0 dB	2022-02-03 12:58:25	--- dB		--- dB	
$L_{Peak(max)}$	--- dB		--- dB		103.2 dB	2022-02-03 13:00:07

Overloads

Count	Duration
0	0:00:00.0

Statistics

LAS 5.0	70.7 dB
LAS 10.0	69.7 dB
LAS 33.3	67.9 dB
LAS 50.0	66.9 dB
LAS 66.6	65.9 dB
LAS 90.0	63.8 dB

Site Number: 2			
Recorded By: Lindsay Liegler			
Job Number: 2022-020			
Date: 2/3/2022			
Time: 12:28 p.m. – 12:43 p.m.			
Location: Along walking trail south of storage facility off West Minthorn Street.			
Source of Peak Noise: Vehicles on 1-15.			
Noise Data			
Leq (dB)	Lmin (dB)	Lmax (dB)	Peak (dB)
54.5	46.1	64.3	97.4

Equipment						
Category	Type	Vendor	Model	Serial No.	Cert. Date	Note
Sound	Sound Level Meter	Larson Davis	LxT SE	0006133	02/24/2021	
	Microphone	Larson Davis	377B02	315201	02/24/2021	
	Preamp	Larson Davis	PRMLxT1L	069947	02/24/2021	
	Calibrator	Larson Davis	CAL200	17325	02/25/2021	

Weather Data			
Est.	Duration: 15 min.		Sky: Clear
	Note: dBA Offset = 0.14		Sensor Height (ft): 3.5
	Wind Ave Speed (mph)	Temperature (degrees Fahrenheit)	Barometer Pressure (hPa)
	8	61	30.20

Photo of Measurement Location

Measurement Report

Report Summary

Meter's File Name	LxT_Data.096.s	Computer's File Name	LxT_0006133-20220203 122806-LxT_Data.096.ldbin
Meter	LxT1 0006133		
Firmware	2.404		
User		Location	
Job Description			
Note			

Start Time	2022-02-03 12:28:06	Duration	0:15:00.0		
End Time	2022-02-03 12:43:06	Run Time	0:15:00.0	Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	54.5 dB		
LAE	84.0 dB	SEA	--- dB
EA	28.0 µPa²h		
EA8	894.6 µPa²h		
EA40	4.5 mPa²h		
LZS_{peak}	97.4 dB	2022-02-03 12:28:52	
LAS_{max}	64.3 dB	2022-02-03 12:37:02	
LAS_{min}	46.1 dB	2022-02-03 12:31:01	
LA_{eq}	54.5 dB		
LC_{eq}	65.4 dB	LC_{eq} - LA_{eq}	10.9 dB
LAI_{eq}	57.4 dB	LAI_{eq} - LA_{eq}	3.0 dB

Exceedances

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

Community Noise

LDN	LDay	LNight	
54.5 dB	54.5 dB	0.0 dB	
LDEN	**LDay**	**LEve**	**LNight**
54.5 dB	54.5 dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	54.5 dB		--- dB		--- dB	
$Ls_{(max)}$	64.3 dB	2022-02-03 12:37:02	--- dB		--- dB	
$LS_{(min)}$	46.1 dB	2022-02-03 12:31:01	--- dB		--- dB	
$L_{Peak(max)}$	--- dB		--- dB		97.4 dB	2022-02-03 12:28:52

Overloads

Count	Duration
0	0:00:00.0

Statistics

LAS 5.0	57.9 dB
LAS 10.0	57.4 dB
LAS 33.3	55.3 dB
LAS 50.0	53.4 dB
LAS 66.6	51.3 dB
LAS 90.0	48.8 dB

Site Number: 3			
Recorded By: Lindsay Liegler			
Job Number: 2022-020			
Date: 2/3/2022			
Time: 12:05 p.m. – 12:20 p.m.			
Location: Along Chaney Avenue.			
Source of Peak Noise: Vehicles on Chaney Avenue.			
Noise Data			
Leq (dB)	Lmin (dB)	Lmax (dB)	Peak (dB)
68.6	49.2	92.9	104.7

Equipment						
Category	Type	Vendor	Model	Serial No.	Cert. Date	Note
Sound	Sound Level Meter	Larson Davis	LxT SE	0006133	02/24/2021	
	Microphone	Larson Davis	377B02	315201	02/24/2021	
	Preamp	Larson Davis	PRMLxT1L	069947	02/24/2021	
	Calibrator	Larson Davis	CAL200	17325	02/25/2021	

Weather Data			
Est.	**Duration:** 15 min.		**Sky:** Clear
	Note: dBA Offset = 0.14		**Sensor Height (ft):** 3.5
	Wind Ave Speed (mph)	Temperature (degrees Fahrenheit)	Barometer Pressure (hPa)
	8	61	30.20

Photo of Measurement Location

Measurement Report

Report Summary

Meter's File Name	LxT_Data.095.s	Computer's File Name	LxT_0006133-20220203 120516-LxT_Data.095.ldbin
Meter	LxT1 0006133		
Firmware	2.404		
User		Location	
Job Description			
Note			

Start Time	2022-02-03 12:05:16	Duration	0:15:00.2		
End Time	2022-02-03 12:20:16	Run Time	0:15:00.2	Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	68.6 dB		
LAE	98.2 dB	SEA	--- dB
EA	731.9 µPa²h		
EA8	23.4 mPa²h		
EA40	117.1 mPa²h		
LZS_{peak}	104.7 dB	2022-02-03 12:18:36	
LAS_{max}	92.9 dB	2022-02-03 12:18:36	
LAS_{min}	49.2 dB	2022-02-03 12:10:54	
LA_{eq}	68.6 dB		
LC_{eq}	73.6 dB	LC_{eq} - LA_{eq}	5.0 dB
LAI_{eq}	72.1 dB	LAI_{eq} - LA_{eq}	3.4 dB

Exceedances

Exceedances	Count	Duration
LAS > 85.0 dB	1	0:00:04.9
LAS > 115.0 dB	0	0:00:00.0
LZSpeak > 135.0 dB	0	0:00:00.0
LZSpeak > 137.0 dB	0	0:00:00.0
LZSpeak > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight	
68.6 dB	68.6 dB	0.0 dB	
LDEN	**LDay**	**LEve**	**LNight**
68.6 dB	68.6 dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	68.6 dB		--- dB		--- dB	
$Ls_{(max)}$	92.9 dB	2022-02-03 12:18:36	--- dB		--- dB	
$LS_{(min)}$	49.2 dB	2022-02-03 12:10:54	--- dB		--- dB	
$L_{Peak(max)}$	--- dB		--- dB		104.7 dB	2022-02-03 12:18:36

Overloads

Count	Duration
0	0:00:00.0

Statistics

LAS 5.0	68.2 dB
LAS 10.0	66.3 dB
LAS 33.3	61.7 dB
LAS 50.0	59.2 dB
LAS 66.6	56.4 dB
LAS 90.0	52.9 dB

ATTACHMENT B

Highway Noise Prediction Model (FHWA-RD-77-108) Outputs – Existing Traffic Noise

TRAFFIC NOISE LEVELS

Project Number: 2022-020
Project Name: Collier Commercial Properties

Background Information

Model Description:	FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Analysis Scenario(s):	Existing
Source of Traffic Volumes:	Caltrans 2017
Community Noise Descriptor:	L_{dn}: x CNEL:

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

Traffic Noise Levels

Analysis Condition Roadway Segment	Land Use	Lanes	Median Width	Peak Hour Volume	ADT Volume	Design Speed (mph)	Dist. from Center to Receptor[1]	Alpha Factor	Barrier Attn. dB(A)	Vehicle Mix Medium Trucks	Vehicle Mix Heavy Trucks	Peak Hour dB(A) L_{eq}	24-Hour dB(A) Ldn
Analysis Condition													
Roadway, Segment	Residential	6	0	0	125,000	65	100	0.5	0	1.8%	0.7%	0.0	78.0

[1] Distance is from the centerline of the roadway segment to the receptor location.

ATTACHMENT C

Federal Highway Administration Roadway Construction Noise Model Outputs – Project Construction

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 8/22/2024
Case Description: Collier Commercial Properties - Site Preparation at Nearest Residence

Description	**Affected Land Use**
Site Preparation	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Grader	No	40	85		820	0
Scraper	No	40		83.6	820	0
Backhoe	No	40		77.6	820	0

Results

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Grader		60.7	56.7
Scraper		59.3	55.3
Backhoe		53.3	49.3
	Total	60.7	**59.5**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 8/22/2024
Case Description: Collier Commercial Properties - Grading at Nearest Residence

Description	**Affected Land Use**
Grading	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Grader	No	40	85		820	0
Dozer	No	40		81.7	820	0
Backhoe	No	40		77.6	820	0
Backhoe	No	40		77.6	820	0

Results

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Grader		60.7	56.7
Dozer		57.4	53.4
Backhoe		53.3	49.3
Backhoe		53.3	49.3
	Total	60.7	**59.3**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date:	8/22/2024
Case Description:	Collier Commercial Properties - Construction, Paving, & Painting at Nearest Reside

Description	**Affected Land Use**
Construction	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Crane	No	16		80.6	820	0
Man Lift	No	20		74.7	820	8
Man Lift	No	20		74.7	820	0
Backhoe	No	40		77.6	820	0
Vibratory Concrete Mixer	No	20		80	820	0
Paver	No	50		77.2	820	0
Roller	No	20		80	820	0
Roller	No	20		80	820	0
Paver	No	50		77.2	820	0
Backhoe	No	40		77.6	820	0
Generator (<25KVA, VMS signs)	No	50		72.8	820	0
Welder / Torch	No	40		74	820	0
Welder / Torch	No	40		74	820	0
Welder / Torch	No	40		74	820	0
Compressor (air)	No	40		77.7	820	0

Results

Calculated (dBA)

Equipment	***Lmax**	**Leq**
Crane	56.3	48.3
Man Lift	42.4	35.4
Man Lift	50.4	43.4
Backhoe	53.3	49.3
Vibratory Concrete Mixer	55.7	48.7
Paver	52.9	49.9
Roller	55.7	48.7
Roller	55.7	48.7
Paver	52.9	49.9
Backhoe	53.3	49.3

Generator (<25KVA, VMS signs)	48.5	45.5
Welder / Torch	49.7	45.7
Welder / Torch	49.7	45.7
Welder / Torch	49.7	45.7
Compressor (air)	53.4	49.4
Total	56.3	**59.6**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 8/22/2024
Case Description: Collier Commercial Properties - Site Preparation at Nearest Commercial Land Use

Description	**Affected Land Use**
Site Preparation	Commercial

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Grader	No	40	85		175	0
Scraper	No	40		83.6	175	0
Backhoe	No	40		77.6	175	0

Results

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Grader		74.1	70.1
Scraper		72.7	68.7
Backhoe		66.7	62.7
	Total	74.1	**72.9**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 8/22/2024
Case Description: Collier Commercial Properties - Grading at Nearest Commercial Land Use

Description	**Affected Land Use**
Grading	Commercial

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Grader	No	40	85		175	0
Dozer	No	40		81.7	175	0
Backhoe	No	40		77.6	175	0
Backhoe	No	40		77.6	175	0

Results

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Grader		74.1	70.1
Dozer		70.8	66.8
Backhoe		66.7	62.7
Backhoe		66.7	62.7
	Total	74.1	**72.8**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 8/22/2024

Case Description: Collier Commercial Properties - Construction, Paving, & Painting At Nearest Commerical Land Use

Description	**Affected Land Use**
Construction	Commercial

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Crane	No	16		80.6	175	0
Man Lift	No	20		74.7	175	0
Man Lift	No	20		74.7	175	0
Backhoe	No	40		77.6	175	0
Vibratory Concrete Mixer	No	20		80	175	0
Paver	No	50		77.2	175	0
Roller	No	20		80	175	0
Roller	No	20		80	175	0
Paver	No	50		77.2	175	0
Backhoe	No	40		77.6	175	0
Generator (<25KVA, VMS signs)	No	50		72.8	175	0
Welder / Torch	No	40		74	175	0
Welder / Torch	No	40		74	175	0
Welder / Torch	No	40		74	175	0
Compressor (air)	No	40		77.7	175	0

Results

	Calculated (dBA)	
Equipment	***Lmax**	**Leq**
Crane	69.7	61.7
Man Lift	63.8	56.8
Man Lift	63.8	56.8
Backhoe	66.7	62.7
Vibratory Concrete Mixer	69.1	62.1
Paver	66.3	63.3
Roller	69.1	62.1
Roller	69.1	62.1
Paver	66.3	63.3
Backhoe	66.7	62.7

Generator (<25KVA, VMS signs)	61.9	58.9
Welder / Torch	63.1	59.1
Welder / Torch	63.1	59.1
Welder / Torch	63.1	59.1
Compressor (air)	66.8	62.8
Total	69.7	**73.1**

*Calculated Lmax is the Loudest value.

ATTACHMENT D

SoundPLAN Outputs – Onsite Project Noise

SoundPLAN
Output Source Information

Number	Reciever Name	Location	Level at Ground Floor
1	Residential	Residential property north of the Project Site.	39.4 dBA
2	Industrial/Commercial	Steve's Towing (south of Project Site)	54.4 dBA
3	Industrial/Commercial	RightWay Temporary Power (north of Project Site)	41.0 dBA
4	Industrial/Commercial	DC Pantry (across West Minthorn Street)	51.3 dBA

Number	Noise Source Information	Citation	Level at Source
1	internal circulation/ parking lot & shop activity	ECORP Consultinjg, Inc. Refrence Noise Measurment (Pbig O Tires)	66.3 dBA