Sartin Storage Yard

Noise Impact Analysis

Calimesa, CA



Prepared for:

City of Calimesa

Prepared by:

Entech Consulting Group

Planning • Environmental • Construction Management

September 2025

Table of Contents

1.0 Introduction 4
1.1 Purpose of Analysis and Study Objectives 4
1.2 Site Location and Study Area 4

2.0 Fundamentals of Noise 7
2.1 Sound, Noise and Acoustics 7
2.2 Frequency and Hertz 7
2.3 Sound Pressure Levels and Decibels 7
2.4 Addition of Decibels 7
2.5 Human Response to Changes in Noise Levels 8
2.6 Noise Descriptors 8
2.7 Traffic Noise Prediction 9
2.8 Sound Propagation 10

3.0 Ground-Borne Vibration Fundamentals 11
3.1 Vibration Descriptors 11
3.2 Vibration Perception 11
3.3 Vibration Propagation 11

4.0 Regulatory Setting 12
4.1 Federal Regulations 12
4.2 State Regulations 12
4.3 Local Regulations and Standards 14
4.3.1 City of Calimesa General Plan 14
4.3.2 City of Calimesa Municipal Code 16

5.0 Study Methods and Procedures 18
5.1 Noise Measurement Procedure and Criteria 18
5.2 Construction Noise Methodology 18
5.3 Construction Vibration Methodology 19
5.4 Operational Noise Methodology 19
5.4.1 Stationary Noise Modeling 19
5.4.2 Operational Traffic Noise Analysis Methods 20

6.0 Existing Noise Environment 22
6.1 Long-Term Noise Measurement Results 22

7.0 Thresholds of Significance 23

8.0 Future Noise Environment Impacts 24
8.1 Future Exterior Noise 24
8.1.1 Noise Impacts to Off-Site Receptors Due to Project Generated Traffic 24
8.1.2 Noise Impacts to Off-Site Receptors Due to Stationary Sources 25

9.0 Construction Noise & Vibration Impacts 29
9.1 Construction Noise 29
9.2 Construction Vibration 30
9.3 Construction Noise Reduction Measures 32

10.0 References 33

Appendix A: Noise Monitoring Data 34

Appendix B: FHWA Model Output 35

Appendix C: Sound Plan Model Input and Output 36

Appendix D: Construction Noise & Vibration Output 37

List of Figures

Figure 1-1 5
Figure 1-2 6
Figure 8-1 28

List of Tables

Table 2-1:Typical A-Weighted Noise Levels 7
Table 4-1. Land Use Compatibility for Community Noise Environments 13
Table 5-1 : Reference Sound Level Measurements for SoundPlan Model 20
Table 5-2: Roadway Parameters and Vehicle Distribution 20
Table 6-1: Long-Term Nosie Measurement Data (dBA)[1] Location LT1 22
Table 8-1: Existing Scenario - Noise Levels Along Roadways (dBA CNEL) 25
Table 8-2: Worst-Case Predicted Operational Noise Levels (dBA, Leq) 27
Table 9-1: Typical Construction Noise Levels[1] 29
Table 9-2: Guideline Vibration Damage Potential Threshold Criteria 31
Table 9-3: Vibration Source Levels for Construction Equipment[1] 31

1.0 Introduction

1.1 Purpose of Analysis and Study Objectives

This noise assessment was prepared to evaluate the potential noise impacts for the project study area and to recommend noise mitigation measures, if necessary, to minimize the potential noise impacts. The assessment was conducted and compared to the noise standards set forth by the Federal, State and Local agencies. Consistent with the City's Noise Guidelines, the project must demonstrate compliance to the applicable noise criterion as outlined within the City's Noise Element and Municipal Code.

The following is provided in this report:

- A description of the study area and the project
- Information regarding the fundamentals of noise
- A description of the local noise guidelines and standards
- An analysis of traffic noise impacts to and from the project site
- An analysis of the stationary noise sources impact from the project site
- An analysis of construction noise impacts

1.2 Site Location and Study Area

The project site is located on an undeveloped parcel situated north of Chandler Avenue, in the City of Calimesa, California. The General Plan Amendment and Zone change will reduce the parcel from 4.17 acres to approximately 2.4 acres, which will include a storage yard with no buildings and 42 storage/parking spaces. Site improvements include a concrete driveway, AC paved yard area, and landscape buffer. A Lot Line Adjustment is proposed to reduce APN 413-210-023 in size from 4.17 acres to approximately 2.4 acres. There will be 42 storage/parking spaces and the yard. The development will also include 240 parking garages and 30 open spaces, and 70,500 square feet of common open space. The storage yard operating hours are from 7am to 7pm. A six-foot decorative masonry wall will be constructed in accordance with the City of Calimesa design guidelines around the perimeter of the project site.

Long Term Measurement Location

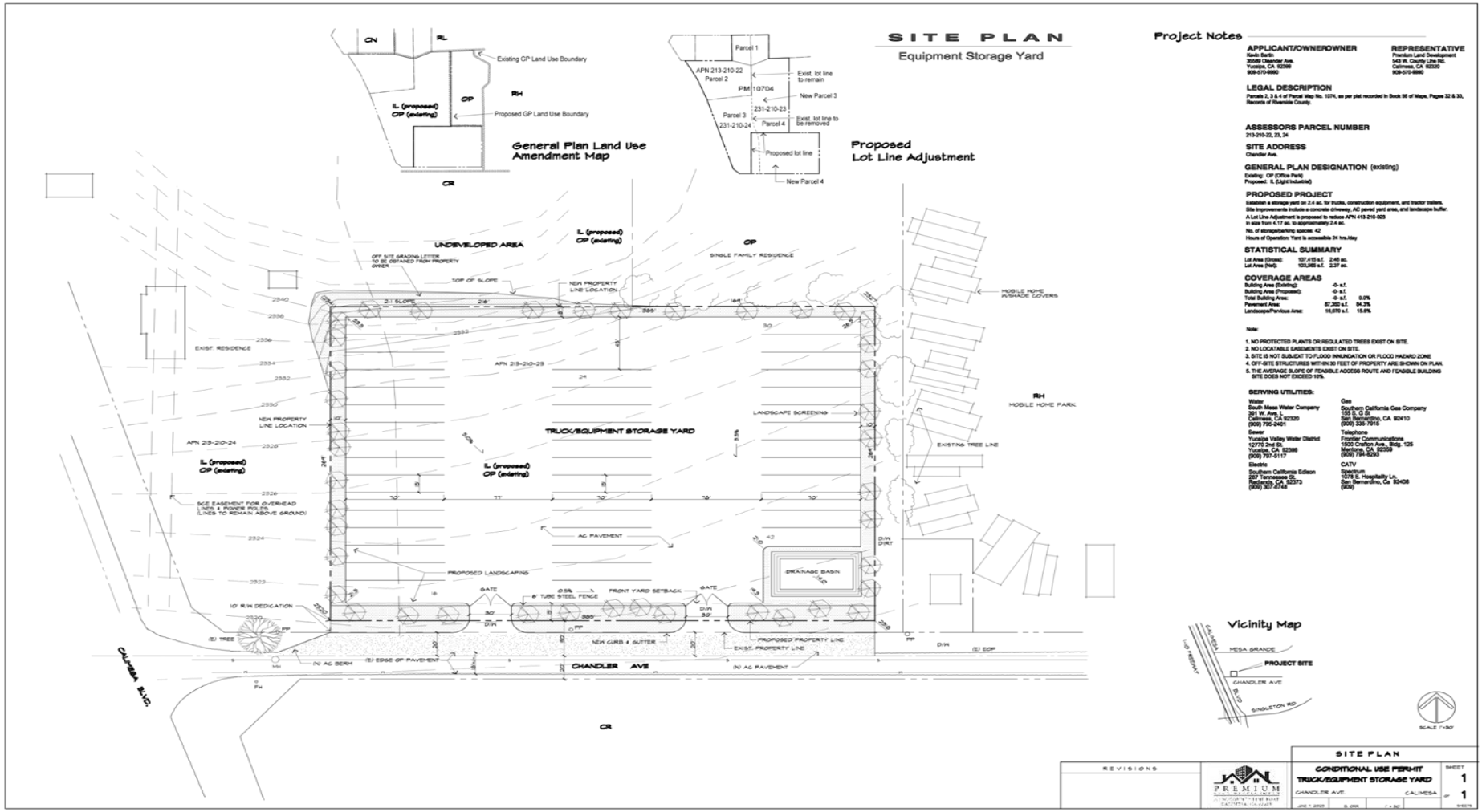
Figure 1-1

Location Map



Figure 1-2

Project Site Plan



2.0 Fundamentals of Noise

This section of the report provides basic information about noise and presents some of the terms used within the report.

2.1 Sound, Noise and Acoustics

Sound is a disturbance created by a moving or vibrating source and is capable of being detected by the hearing organs. Sound may be thought of as mechanical energy of a moving object transmitted by pressure waves through a medium to a human ear. For traffic, or stationary noise, the medium of concern is air. *Noise* is defined as sound that is loud, unpleasant, unexpected, or unwanted.

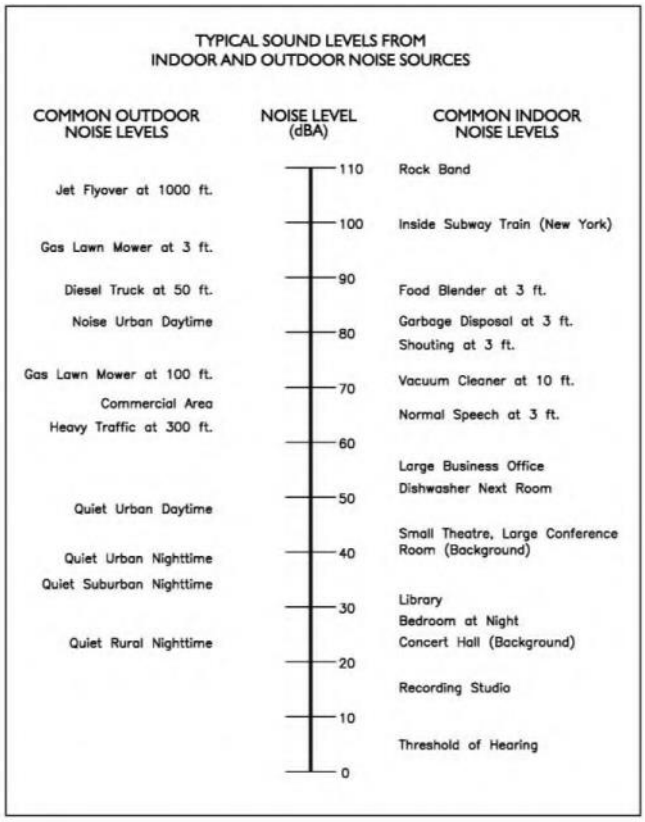
2.2 Frequency and Hertz

A continuous sound is described by its *frequency* (pitch) and its *amplitude* (loudness). Frequency relates to the number of pressure oscillations per second. Low-frequency sounds are low in pitch (bass sounding) and high-frequency sounds are high in pitch (squeak). These oscillations per second (cycles) are commonly referred to as Hertz (Hz). The human ear can hear from the bass pitch starting out at 20 Hz all the way to the high pitch of 20,000 Hz.

2.3 Sound Pressure Levels and Decibels

The *amplitude* of a sound determines it loudness. The loudness of sound increases or decreases as the amplitude increases or decreases. Sound pressure amplitude is measure in units of micro-Newton per square inch meter (N/m2), also called micro-Pascal (µPa). One µPa is approximately one hundred billionths (0.00000000001) of normal atmospheric pressure. Sound pressure level (SPL or L_p) is used to describe in logarithmic units the ratio of actual sound pressures to a reference pressure squared. These units are called decibels abbreviated dB. Exhibit noise sources.

Table 2-1:Typical A-Weighted Noise Levels



2.4 Addition of Decibels

Because decibels are on a logarithmic scale, sound pressure levels cannot be added or subtracted by simple plus or minus addition. When two sounds or equal SPL are combined, they will produce an SPL 3 dB greater than the original single SPL. In other words, sound energy must be doubled to produce a 3 dB increase. If two sounds differ by approximately 10 dB, the higher sound level is the predominant sound.

2.5 Human Response to Changes in Noise Levels

In general, the healthy human ear is most sensitive to sounds between 1,000 Hz and 5,000 Hz, (A-weighted scale) and it perceives a sound within that range as being more intense than a sound with a higher or lower frequency with the same magnitude. For purposes of this report as well as with most environmental documents, the A-scale weighting is typically reported in terms of A-weighted decibel (dBA). Typically, the human ear can barely perceive the change in noise level of 3 dB. A change in 5 dB is readily perceptible, and a change in 10 dB is perceived as being twice or half as loud. As previously discussed, a doubling of sound energy results in a 3 dB increase in sound, which means that a doubling of sound energy (e.g. doubling the volume of traffic on a highway) would result in a barely perceptible change in sound level.

Changes in Intensity Level, dBA	Changes in Apparent Loudness
1	Not perceptible
3	Just perceptible
5	Clearly noticeable
10	Twice (or half) as loud

https://www.fhwa.dot.gov/environMent/noise/regulations_and_guidance/polguide/polguide02.cfm

2.6 Noise Descriptors

Noise in our daily environment fluctuates over time. Some noise levels occur in regular patterns, others are random. Some noise levels are constant while others are sporadic. Noise descriptors were created to describe the different time-varying noise levels.

A-Weighted Sound Level: The sound pressure level in decibels as measured on a sound level meter using the A-weighted 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 response of the human ear. A numerical method of rating human judgment of loudness.

Ambient Noise Level: The composite of noise from all sources, near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

Community Noise Equivalent Level (CNEL): The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of five (5) decibels to sound levels in the evening from 7:00 to 10:00 PM and after addition of ten (10) decibels to sound levels in the night before 7:00 AM and after 10:00 PM.

Decibel (dB): A unit for measuring the amplitude of a 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, which is 20 micro-pascals.

dB(A): A-weighted sound level (see definition above).

Equivalent Sound Level (LEQ): The sound level corresponding to a steady noise level over a given sample period with the same amount of acoustic energy as the actual time varying noise level. The energy average noise level during the sample period.

Habitable Room: Any room meeting the requirements of the Uniform Building Code or other applicable regulations which is intended to be used for sleeping, living, cooking or dining purposes, excluding such enclosed spaces as closets, pantries, bath or toilet rooms, service rooms, connecting corridors, laundries, unfinished attics, foyers, storage spaces, cellars, utility rooms and similar spaces.

L(n): The A-weighted sound level exceeded during a certain percentage of the sample time. For example, L10 in the sound level exceeded 10 percent of the sample time. Similarly L50, L90 and L99, etc.

Noise: *A*ny unwanted sound or sound which is undesirable because it interferes with speech and hearing, or is intense enough to damage hearing, or is otherwise annoying. The State Noise Control Act defines noise as "...excessive undesirable sound...".

Outdoor Living Area: Outdoor spaces that are associated with residential land uses typically used for passive recreational activities or other noise-sensitive uses. Such spaces include patio areas, barbecue areas, jacuzzi areas, etc. associated with residential uses; outdoor patient recovery or resting areas associated with hospitals, convalescent hospitals, or rest homes; outdoor areas associated with places of worship which have a significant role in services or other noise-sensitive activities; and outdoor school facilities routinely used for educational purposes which may be adversely impacted by noise. Outdoor areas usually not included in this definition are: front yard areas, driveways, greenbelts, maintenance areas and storage areas associated with residential land uses; exterior areas at hospitals that are not used for patient activities; outdoor areas associated with places of worship and principally used for short-term social gatherings; and, outdoor areas associated with school facilities that are not typically associated with educational uses prone to adverse noise impacts (for example, school play yard areas).

Percent Noise Levels: See L(n).

Sound Level (Noise Level): The weighted sound pressure level obtained by use of a sound level meter having a standard frequency-filter for attenuating part of the sound spectrum.

Sound Level Meter: An instrument, including a microphone, an amplifier, an output meter, and frequency weighting networks for the measurement and determination of noise and sound levels.

Single Event Noise Exposure Level (SENEL): The dB(A) level which, if it lasted for one second, would produce the same A-weighted sound energy as the actual event.

2.7 Traffic Noise Prediction

Noise levels associated with traffic depends on a variety of factors: (1) volume of traffic, (2) speed of traffic, (3) auto, medium truck (2–3 axle) and heavy truck percentage (4 axle and greater), and sound propagation. The greater the volume of traffic, higher speeds and truck percentages equate to a louder volume in noise. A doubling of the Average Daily Traffic (ADT) along a roadway will increase noise levels by approximately 3 dB; reasons for this are discussed in the sections above.

2.8 Sound Propagation

As sound propagates from a source it spreads geometrically. Sound from a small, localized source (i.e., a point source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates at a rate of 6 dB per doubling of distance. The movement of vehicles down a roadway makes the source of the sound appear to propagate from a line (i.e., line source) rather than a point source. This line source results in the noise propagating from a roadway in a cylindrical spreading versus a spherical spreading that results from a point source. The sound level attenuates for a line source at a rate of 3 dB per doubling of distance.

As noise propagates from the source, it is affected by the ground and atmosphere. Noise models use hard site (reflective surfaces) and soft site (absorptive surfaces) to help calculate predicted noise levels. Hard site conditions assume no excessive ground absorption between the noise source and the receiver. Soft site conditions such as grass, soft dirt or landscaping attenuate noise at a rate of 1.5 dB per doubling of distance. When added to the geometric spreading, the excess ground attenuation results in an overall noise attenuation of 4.5 dB per doubling of distance for a line source and 7.5 dB per doubling of distance for a point source.

Research has demonstrated that atmospheric conditions can have a significant effect on noise levels when noise receivers are located 200 feet from a noise source. Wind, temperature, air humidity and turbulence can further impact have far sound can travel.

3.0 Ground-Borne Vibration Fundamentals

3.1 Vibration Descriptors

Ground-borne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. The effects of ground-borne vibrations typically only cause a nuisance to people, but at extreme vibration levels, damage to buildings may occur. Although ground-borne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. Ground-borne noise is an effect of ground-borne vibration and only exists indoors, since it is produced from noise radiated from the motion of the walls and floors of a room and may also consist of the rattling of windows or dishes on shelves.

Several different methods are used to quantify vibration amplitude.

PPV – Known as the peak particle velocity (PPV) which is the maximum instantaneous peak in vibration velocity, typically given in inches per second.

RMS – Known as root mean squared (RMS) can be used to denote vibration amplitude

3.2 Vibration Perception

Outdoor sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible ground-borne noise or vibration. To counter the effects of ground-borne vibration, the Federal Transit Administration (FTA) has published guidance relative to vibration impacts. According to the Caltrans, fragile buildings can be exposed to ground-borne vibration levels of 0.2 inches per second without experiencing structural damage.

3.3 Vibration Propagation

There are three main types of vibration propagation: surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wave front, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wave front. However, unlike P-waves, the particle motion is transverse, or side-to-side and perpendicular to the direction of propagation.

As vibration waves propagate from a source, the vibration energy decreases in a logarithmic nature and the vibration levels typically decrease by 6 VdB per doubling of the distance from the vibration source. As stated above, this drop-off rate can vary greatly depending on the soil but has been shown to be effective enough for screening purposes, in order to identify potential vibration impacts that may need to be studied through actual field tests.

4.0 Regulatory Setting

The project is located in the City of Calimesa and noise regulations are addressed through the efforts of various federal, state, and local government agencies. The agencies responsible for regulating noise are discussed below.

4.1 Federal Regulations

The adverse impact of noise was officially recognized by the federal government in the Noise Control Act of 1972, which serves three purposes:

- Publicize noise emission standards for interstate commerce
- Assist state and local abatement efforts
- Promote noise education and research

The Federal Office of Noise Abatement and Control (ONAC) originally was tasked with implementing the Noise Control Act. However, it was eventually eliminated leaving other federal agencies and committees to develop noise policies and programs. Some examples of these agencies are as follows: The Department of Transportation (DOT) assumed a significant role in noise control through its various agencies. The Federal Aviation Agency (FAA) is responsible to regulate noise from aircraft and airports. The Federal Highway Administration (FHWA) is responsible to regulate noise from the interstate highway system. The Occupational Safety and Health Administration (OSHA) is responsible for the prohibition of excessive noise exposure to workers.

The federal government advocates that local jurisdiction use their land use regulatory authority to arrange new development in such a way that "noise sensitive" uses are either prohibited from being constructed adjacent to a highway or, or alternatively that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

Since the federal government has preempted the setting of standards for noise levels that can be emitted by the transportation source, the City is restricted to regulating the noise generated by the transportation system through nuisance abatement ordinances and land use planning.

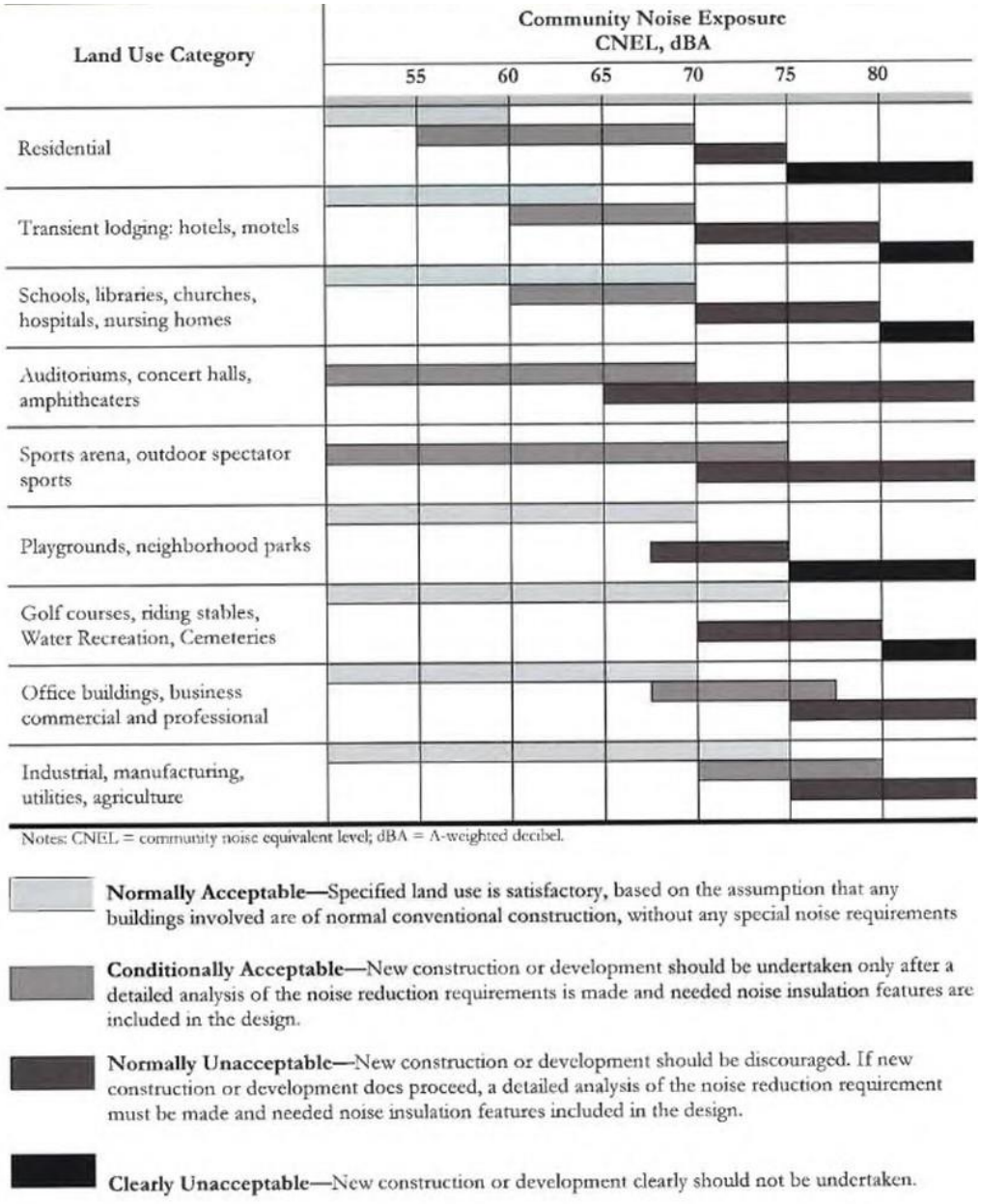
4.2 State Regulations

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

The State of California has established noise insulation standards as outlined in Title 24 and the Uniform Building Code (UBC) which in some cases requires acoustical analyses to outline exterior noise levels and to ensure interior noise levels do not exceed the interior threshold. The State mandates that the legislative body of each county and city adopt a noise element as part of its comprehensive general plan.

The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable as illustrated in Table 4-1.

Table 4-1. Land Use Compatibility for Community Noise Environments



4.3 Local Regulations and Standards

4.3.1 City of Calimesa General Plan

The City of Calimesa has included goals and policies within the General Plan Noise Element to minimize mobile-source generated noise levels. The following goals, policies, and implementation programs apply to this project as they apply to roadway improvement projects.

GOAL N-1: Ensure that all land uses are protected from excessive and unwanted noise.

GOAL N-2: Prevent and mitigate the adverse impacts of excessive noise exposure on the residents, employees, visitors, and noise-sensitive uses in Calimesa.

POLICY N-1: Future development that could increase ambient noise levels shall be required to mitigate the anticipated noise increase to the extent possible.

POLICY N-7: Consider the following uses to be sensitive to noise and vibration, and discourage these uses in areas where existing or projected future noise levels would be in excess of 65 dBA CNEL and/or vibration would be more than 0.0787 peak particle velocity (inches per second):

- Schools
- Hospitals
- Rest homes
- Long-term care facilities
- Mental care facilities
- Residential uses
- Libraries
- Passive recreation uses
- Places of worship

POLICY N-9: The City will work to create and preserve a quiet living environment for all residential neighborhoods.

POLICY N-10: When making decisions regarding changes to the General Plan or Zoning Maps, or regarding the suitability of a proposed use, the standards in Table N-C shall apply.

TABLE N-C: NOISE COMPATIBILITY BY LAND USE TYPE

Land Use Designations	Completely Compatible	Tentatively Compatible	Normally Incompatible	Completely Incompatible
All Residential (Single- and Multi-Family)	Less than 60 dBA	60–70 dBA	70–75 dBA	Greater than 75 dBA
All Nonresidential (Commercial, Industrial & Institutional)	Less than 70 dBA	70–75 dBA	Greater than 75 dBA	(1)
Public Parks (Lands on which public parks are located or planned)	Less than 65 dBA	65–70 dBA	70–75 dBA	Greater than 75 dBA

All noise levels shown in this table are designated CNEL.
1. To be determined as part of the project review process.

POLICY N-11: Table N-D provides the City's standards for maximum exterior non- transportation noise levels to which land designated for residential land uses may be exposed for any 30-minute period on any day. Where existing ambient noise levels exceed these standards, the ambient noise level shall be highest allowable noise level as measured in dBA LEQ (30 minutes).

TABLE N-D: EXTERIOR NOISE LEVEL STANDARDS FOR NON-TRANSPORTATION NOISE, MEASURED AS dBA L_{EQ} (30 MINUTES)

Land Use Type	Time Period	Maximum Noise Level (dBA)
Single-Family Homes and Duplexes	10 P.M. to 7 A.M.	50
	7 A.M. to 10 P.M.	60
Multi-Family Residential – 3 or More Units Per Building (Triplex +)	10 P.M. to 7 A.M.	55
	7 A.M. to 10 P.M.	60

POLICY N-20: The City shall adopt and apply measures to limit construction noise in residential areas.

POLICY N-31: Ensure that construction activities are regulated to establish hours of operation in order to prevent and/or mitigate the generation of excessive or adverse noise impacts on surrounding areas.

POLICY N-32: Require that all construction equipment be kept properly tuned and use noise reduction features (e.g., mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer.

4.3.2 City of Calimesa Municipal Code

The City of Calimesa Municipal Code contains regulations to protect residents from exposure to excessive noise and are summarized below.

Title 8 – Health and Safety, Chapter 8.15 – Noise Abatement and Control Section
8.15.010 of the Calimesa Municipal Code (CMC) states the purpose of Chapter 8.15 is to establish criteria and standards for regulating noise levels within the City and implementing the noise provisions contained in the City's General Plan.

8.15.080 Construction equipment.
Except for emergency work, it is unlawful for any person, including the city, to operate any single or a combination of powered construction equipment at any construction site, except as outlined in subsections (A) and (B) of this section:

A. It is unlawful for any person, including the city, to operate any single or a combination of powered construction equipment at any construction site before 7:00 a.m. or after 7:00 p.m. In addition, it is unlawful for any person, including the city, to operate any single or a combination of powered construction equipment at any construction site before 10:00 a.m. or after 5:00 p.m. on Saturdays and Sundays, January 1st, the last Monday in May, known as "Memorial Day," July 4th, the first Monday in September, Thanksgiving Day and December 25th. When January 1st, July 4th, or December 25th fall on a Sunday, it is unlawful for any person to operate any single or a combination of powered construction equipment at any construction site before 10:00 a.m. or after 5:00 p.m. on the following Monday.

B. No such equipment, or a combination of equipment regardless of age or date of acquisition, shall be operated so as to cause noise at a level in excess of 75 decibels for more than eight hours during any 24-hour period when measured at or within the property lines of any property which is developed and used either in part or in whole for residential purposes.

C. In the event that lower noise limit standards are established for construction equipment pursuant to state or federal law, said lower limits shall be used as a basis for revising and amending the noise level limits specified in subsection (B) of this section. [Ord. 91-21; Code 1990 § 4.2.08.]

8.15.090 Containers and construction material
It is unlawful for any person to handle or transport or cause to be handled or transported in any public place any container or any construction material in such a way as to create a disturbing, excessive, or offensive noise as defined in CMC 8.15.020. [Ord. 91-21; Code 1990 § 4.2.09.]

Public Works Construction The City of Calimesa will make reasonable efforts to limit construction hours as outlined in CMC 9.15.080 to protect the health, safety, or general welfare of Calimesa residents.

The regulations and policies discussed above are intended to protect the community from excessive noise and vibration to ensure residents' and workers' quality of life in the City. The City is responsible for the continued enforcement of federal, state, and local regulations pertaining to noise generation and impacts and implementing Safety Element policies and applicable regulations of the CMC to ensure continued protection of the community from excessive noise and vibration in the future growth and development.

In community noise assessment, changes in noise levels greater than 3 dBA are often identified as "barely perceptible" while changes of 5 dBA are "ready perceptible." In the range of 1 dBA to 3 dBA, people who are very sensitive to noise may perceive a slight change in noise level.

In laboratory testing situations, humans can detect noise level changes of slightly less than 1 dBA. However, in a community situation, noise exposure is extended over a long-time period, and changes in noise levels occur over the years rather than the immediate comparison made in a laboratory situation. Therefore, the level at which changes in community noise levels become discernible is likely to be some value greater than 1 dBA, and 3 dBA appears to be appropriate for most people.

5.0 Study Methods and Procedures

The following section describes the noise modeling procedures and assumptions used for this assessment.

5.1 Noise Measurement Procedure and Criteria

Noise measurements are taken to determine the existing noise levels. A noise receiver or receptor is any location in the noise analysis in which noise might produce an impact. The following criteria are used to select measurement locations and receptors:

- Locations expected to receive the highest noise impacts, such as first row of houses
- Locations that are acoustically representative and equivalent of the area of concern
- Human land usage
- Sites clear of major obstruction and contamination

Sound level measurements were conducted in accordance with Caltrans technical noise specifications. All measurements equipment meets American National Standards Institute (ANSI) specifications for sound level meters (S1.4-1983 identified in Chapter 19.68.020.AA). The following gives a brief description of the Caltrans Technical Noise Supplement procedures for sound level measurements:

- Microphones for sound level meters were placed 5-feet above the ground for all measurements
- Sound level meters were calibrated (Larson Davis CAL 200) before and after each measurement
- Following the calibration of equipment, a wind screen was placed over the microphone
- Frequency weighting was set on “A” and slow response
- Results of the long-term noise measurements were recorded on field data sheets
- During any short-term noise measurements any noise contaminations such as barking dogs, local traffic, lawn mowers, or aircraft fly-overs were noted
- Temperature and sky conditions were observed and documented

5.2 Construction Noise Methodology

This analysis focuses on the potential ground-borne vibration associated with vehicular traffic and construction activities. Ground-borne vibration levels from automobile traffic are generally overshadowed by vibration generated by heavy trucks that roll over the same uneven roadway surfaces. However, due to the rapid drop-off rate of ground-borne vibration and the short duration of the associated events, vehicular traffic-induced ground-borne vibration is rarely perceptible beyond the roadway right-of-way, and rarely results in vibration levels that cause damage to buildings in the vicinity.

The assessment of construction noise impacts must be relatively general at this phase of the project because many of the decisions affecting noise will be at the discretion of the contractor. However, an assessment based on the type of equipment expected to be used by the contractor can provide a reasonable estimate of potential noise impacts and the need for noise mitigation. A worst-case construction noise scenario was developed and the FHWA Road Construction Noise Model (RCNM)

was used to estimate construction noise levels for mobile and stationary sources. Noise levels were estimated based on a worst-case scenario of the noisiest pieces of mobile source construction equipment (i.e. earthmoving equipment) operating simultaneously. Earthmoving equipment includes machinery such as backhoes, bulldozers, excavators, and front loaders. For the stationary sources, the noisiest piece of equipment that would be utilize is an air compressor during the architectural coating phase of construction.

The calculated noise level was then compared to the respective local noise regulation to determine if construction would cause a short-term noise impact at nearby residential land uses. Receiver distance to the construction activity along with the construction equipment operating at maximum load will have the greatest influence on construction noise levels experienced at residential land uses.

5.3 Construction Vibration Methodology

However, while vehicular traffic is rarely perceptible, construction has the potential to result in varying degrees of temporary ground vibration, depending on the specific construction activities and equipment used. Ground vibration levels associated with various types of construction equipment are obtained from the FTA Noise and Vibration Manual (FTA, 2018). Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the human response (annoyance) using the following vibration assessment methods defined by the FTA. To describe the human response (annoyance) associated with vibration impacts the FTA provides the following equation:

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

5.4 Operational Noise Methodology

5.4.1 Stationary Noise Modeling

SoundPLAN (SP) acoustical modeling software was utilized to model future worst-case stationary noise impacts to the adjacent land uses. SP is capable of evaluating multiple stationary noise source impacts at various receiver locations. SP's software utilizes algorithms (based on the inverse square law and reference equipment noise level data) to calculate noise level projections. The software allows the user to input specific noise sources, spectral content, sound barriers, building placement, topography, and sensitive receptor locations.

The future worst-case noise level projections were modeled using referenced sound level data for the various stationary on-site sources (idling trucks and trailer parking). The SP model assumes truck idling and trailer parking are operating simultaneously (worst-case scenario) when the noise will in reality be intermittent and lower in noise level. In addition, the modeling takes into account the perimeter walls and site elevations. The reference sound level data are provided below in Table 5-1.

Table 5-1 : Reference Sound Level Measurements for SoundPlan Model

Source	Source Type	# of Units	Reference Level (Leq, dBA)	Reference Level (Lmax, dBA)	Distance (ft)
Idling Semi Truck	Point Source	25	73.8	74.9	10
Trailer Parking	Area(SP Parking Tool)	42	-	-	1 trailer per hr

5.4.2 Operational Traffic Noise Analysis Methods

Traffic noise from vehicular traffic was projected using a computer program that replicates the FHWA Traffic Noise Prediction Model (FHWA-RD-77-108). The FHWA model arrives at the predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). The referenced traffic data was applied to the model and is in Appendix B. The following outlines the key adjustments made to the REMEL for the roadway inputs:

- Roadway classification – (e.g. freeway, major arterial, arterial, secondary, collector, etc),
- Roadway Active Width – (distance between the center of the outer most travel lanes on each side of the roadway)
- Average Daily Traffic Volumes (ADT), Travel Speeds, Percentages of automobiles, medium trucks and heavy trucks
- Roadway grade and angle of view
- Site Conditions (e.g. soft vs. hard)
- Percentage of total ADT which flows each hour throughout a 24-hour period.

Table 5-2 indicates the roadway parameters and vehicle distribution utilized for this study.

Table 5-2: Roadway Parameters and Vehicle Distribution

Roadway	Segment	Existing ADT[1]	Existing Plus Project ADT	Speed (MPH)	Site Conditions
Calimesa Blvd	South of Sandalwood Dr	18,300	18,384	40	Soft
Chandler Ave	East of Calimesa Blvd	1,000	1,084	25	Soft
Secondary and Collector Vehicle Distribution (Truck Mix)[2]					
Motor-Vehicle Type		**Daytime % (7AM to 7 PM)**	**Evening % (7 PM to 10 PM)**	**Night % (10 PM to 7 AM)**	**Total % of Traffic Flow**
Automobiles		75.5	14.0	10.5	97.42
Medium Trucks		48.9	2.2	48.9	1.84
Heavy Trucks		47.3	5.4	47.3	0.74

Notes:
[1] Roadway capacity from HCM Tables (Round numbers based on Level of Service D/E thresholds in HCM 6th Edition)
[2] Vehicle distribution data is based on Riverside County Mix data for collectors and secondary roadways.

The following outlines key adjustments to the REMEL for project site parameter inputs:

- Vertical and horizontal distances (Sensitive receptor distance from noise source)
- Noise barrier vertical and horizontal distances (Noise barrier distance from sound source and receptor).
- Traffic noise source spectra
- Topography

Traffic noise levels were predicted at the closest residential area on the impacted roadway. The outputs of the project noise calculation worksheet are located in Appendix B.

6.0 Existing Noise Environment

One (1) long-term (24-hr) ambient noise measurement was conducted at or near the project site. The noise measurements were taken to determine the existing baseline noise conditions.

6.1 Long-Term Noise Measurement Results

The results of the long-term noise data are presented in Table 6-1.

Table 6-1: Long-Term Nosie Measurement Data (dBA)[1] Location LT1

Date	Start	Stop	Leq	Lmax	Lmin	L2	L8	L25	L50	L90
2/9/2024	12:00 AM	1:00 AM	63.5	66.9	58.7	66.4	65.7	64.3	63.4	60.5
2/9/2024	1:00 AM	2:00 AM	63.1	67.2	55.5	66.4	65.1	64.0	63.0	60.4
2/9/2024	2:00 AM	3:00 AM	62.5	68.7	55.0	66.6	64.9	63.4	61.5	58.7
2/9/2024	3:00 AM	4:00 AM	63.9	67.8	58.1	67.5	66.2	64.8	63.5	60.6
2/9/2024	4:00 AM	5:00 AM	65.9	69.7	58.3	68.4	67.7	66.9	65.8	62.7
2/9/2024	5:00 AM	6:00 AM	67.3	69.5	64.6	69.2	68.6	68.0	67.4	65.8
2/9/2024	6:00 AM	7:00 AM	68.2	70.8	64.2	70.5	69.8	68.6	68.4	66.0
2/9/2024	7:00 AM	8:00 AM	64.9	67.9	60.1	67.4	66.8	65.8	65.0	62.2
2/9/2024	8:00 AM	9:00 AM	66.1	68.8	60.9	68.4	67.7	66.9	66.0	63.6
2/9/2024	9:00 AM	10:00 AM	65.6	67.8	62.2	67.8	67.3	66.3	65.5	63.5
2/9/2024	10:00 AM	11:00 AM	65.0	67.7	60.9	67.3	66.6	65.6	64.9	63.3
2/9/2024	11:00 AM	12:00 PM	64.9	72.6	61.9	68.4	65.8	65.0	64.3	63.3
2/9/2024	12:00 PM	1:00 PM	65.7	68.3	61.4	68.0	67.5	66.7	65.6	63.3
2/9/2024	1:00 PM	2:00 PM	65.3	68.8	62.0	67.5	67.2	65.9	65.2	63.1
2/9/2024	2:00 PM	3:00 PM	65.5	68.9	62.7	67.2	66.8	65.9	65.3	64.0
2/9/2024	3:00 PM	4:00 PM	64.3	68.4	60.3	67.4	66.2	65.2	64.0	61.9
2/9/2024	4:00 PM	5:00 PM	67.3	68.9	65.3	68.7	68.3	67.9	67.2	66.0
2/9/2024	5:00 PM	6:00 PM	66.7	69.9	64.5	68.3	67.9	67.4	66.5	65.3
2/9/2024	6:00 PM	7:00 PM	66.6	69.5	64.3	68.8	68.0	67.2	66.3	65.1
2/9/2024	7:00 PM	8:00 PM	65.4	68.2	60.8	68.1	67.4	66.6	65.0	63.3
2/9/2024	8:00 PM	9:00 PM	64.2	68.7	60.3	66.9	66.1	64.7	63.7	61.9
2/9/2024	9:00 PM	10:00 PM	63.7	68.9	58.3	66.9	65.6	64.2	63.4	61.6
2/9/2024	10:00 PM	11:00 PM	62.7	65.7	58.5	65.5	64.6	63.5	62.3	60.5
2/9/2024	11:00 PM	12:00 AM	62.7	66.4	55.3	65.6	64.9	63.4	62.5	59.9
	CNEL		**71**							

Notes:
1. Long-term noise monitoring location (LT1) is illustrated in Figure 1-1.

Noise data indicate the equivalent ambient level measured from 63 up to 67 dBA L_{eq} near the location LT1 on the south side of the project site. The measured ambient level at or near the project site shows that the primary noise source is traffic along Chandler Avenue and Calimesa Blvd near I-10. For this analysis the quietest equivalent noise level will be used as the ambient baseline. Additional field notes and photographs are provided in Appendix A.

7.0 Thresholds of Significance

Appendix G of the California Environmental Quality Act (CEQA) Guidelines states that a project could have a noise impact if any of the following would occur:

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

b) Generation of excessive groundborne vibration or groundborne noise levels

Operational Noise

Stationary Source Noise

If project-related operational (stationary-source) noise levels exceed:

- the exterior noise level standard at nearby sensitive receiver locations identified by land use category or ambient if existing levels exceed the standard (see section 4.3.1 above Table N-D Exterior, Noise Level Standards for Non-Transportation Noise).

Traffic Noise

If the existing ambient noise levels at the nearby noise-sensitive receivers near the project site:

- are less than 60 dBA and the traffic noise from the project creates a readily perceptible 5 dBA or greater Project related noise level increase: or
- range from 60 to 65 dBA and the traffic noise from the project creates a barely perceptible 3 dBA or greater Project-related noise level increase; or
- already exceed 65 dBA, and the traffic noise from the project creates a community noise level increase of greater than 1.5 dBA (FICON, 1992).

Construction Noise and Vibration

For the purposes of this analysis, a significant impact would occur if:

- construction activities occurred outside of the City's permissible hours of construction (7:00 a.m. and 7:00 p.m. during weekdays and 10:00 a.m. and 5:00 p.m. on Saturdays, Sundays, and holidays) in excess of the noise thresholds.
- noise levels exceed 75 decibels for more than eight hours during any 24-hour period when measured at or within the property lines of any property which is developed and used either in part or in whole for residential purposes.

Vibration impacts would be significant if levels exceed the Caltrans recommended standard of 0.2 in/sec PPV with respect to the prevention of structural damage for normal buildings or if levels exceed the City of Calimesa vibration threshold of 0.0787 in/sec for residential or passive recreational land uses.

8.0 Future Noise Environment Impacts

This assessment analyzes future noise impacts from the project and compares the results to the City's Noise Standards. The analysis details the estimated exterior noise levels. Stationary noise impacts are analyzed from the on-site noise sources such as loading docks and trailer parking.

8.1 Future Exterior Noise

The following outlines the exterior noise levels associated with the project.

8.1.1 Noise Impacts to Off-Site Receptors Due to Project Generated Traffic

A worst-case project generated traffic noise level was modeled utilizing the FHWA Traffic Noise Prediction Model - FHWA-RD-77-108. The modeling is theoretical and does not take into account any existing barriers, structures, and/or topographical features that may further reduce noise levels. Therefore, the levels are shown for comparative purposes only to show the difference in with and without project conditions. In addition, the noise contours for 60, 65 and 70 dBA CNEL were calculated. The potential off-site noise impacts caused by an increase of traffic from operation of the project on the nearby roadways were calculated for the following scenarios:

Existing Year (without Project): This scenario refers to existing year traffic noise conditions.

Existing Year (Plus Project): This scenario refers to existing year + project traffic noise conditions.

Table 8-1 compares the without and with project scenario and shows the change in traffic noise levels as a result of the project. As shown in Table 8-1, the modeled changes in noise levels due to the project are 0.1 dB CNEL along Calimesa Boulevard (where the existing noise level is 68.4 dB CNEL) and 0.4 dB CNEL along Chandler Avenue (where the existing noise level is 51.8 dB CNEL). Since these increases fall well below the applicable FICON significance thresholds, the project is not expected to result in significant traffic noise impacts. Traffic noise calculations sheets are provided in Appendix B.

<Table 8-1, next page>

Table 8-1: Existing Scenario - Noise Levels Along Roadways (dBA CNEL)

Existing Without Project Exterior Noise Levels

Roadway	Segment	CNEL at 60 Ft (dBA)	Distance to Contour (Ft)			
			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
Calimesa Blvd	South of Sandalwood Dr	68.4	47	102	219	473
Chandler Ave	East of Calimesa Blvd	51.8	4	8	17	37

Existing With Project Exterior Noise Levels

Roadway	Segment	CNEL at 60 Ft (dBA)	Distance to Contour (Ft)			
			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
Calimesa Blvd	South of Sandalwood Dr	68.5	47	102	220	474
Chandler Ave	East of Calimesa Blvd	52.2	4	8	18	39

Change in Existing Noise Levels as a Result of Project

Roadway[1]	Segment	CNEL at 50 Feet dBA[2]				
		Existing Without Project	Existing With Project	Change in Noise Level	Allowable[3] Increase	Potential Significant Impact
Calimesa Blvd	South of Sandalwood Dr	68.4	68.5	0.1	1.5	No
Chandler Ave	East of Calimesa	51.8	52.2	0.4	5	No

Notes:
[1] Exterior noise levels calculated at 5 feet above ground level.
[2] Noise levels calculated from centerline of subject roadway.
[3] Allowable increases based on FICON thresholds. Calimesa Blvd segment ambient level above 65 dBA CNEL, allowable increase is 1.5 dBA; Chandler Ave ambient level below 60 dBA CNEL, allowable increase is 5 dBA.

8.1.2 Noise Impacts to Off-Site Receptors Due to Stationary Sources

Sensitive receptors that may be affected by project operational noise include existing residences to the north, south and east. The worst-case stationary noise was modeled using SoundPLAN acoustical modeling software as shown in Figure 8-1. Figure 8-1 shows the predicted Leq operational noise levels. Worst-case assumes the trailer parking and idling of trucks are always operational when in reality the noise will be intermittent and cycle on/off depending on the customer usage. The storage yard operating hours are from 7am to 7pm. Therefore, only daytime and evening thresholds apply.

A total of four (4) residential receptors (R1 – R4) were modeled to evaluate the project's operational impact. This study analyzes the project only operational noise level projections and the project plus ambient noise level projections, see Table 8-2 below.

The model indicates that the project-only noise levels at the existing residences around the project site with a six (6) foot wall will range from 41 to 50 dBA Leq. The Leq levels resulting from the project operation meet the City's residential daytime and evening noise standards as shown in Table 8-2. The impact is less than significant. The SoundPLAN modeling inputs and outputs, along with the equipment noise reference data are provided in Appendix C.

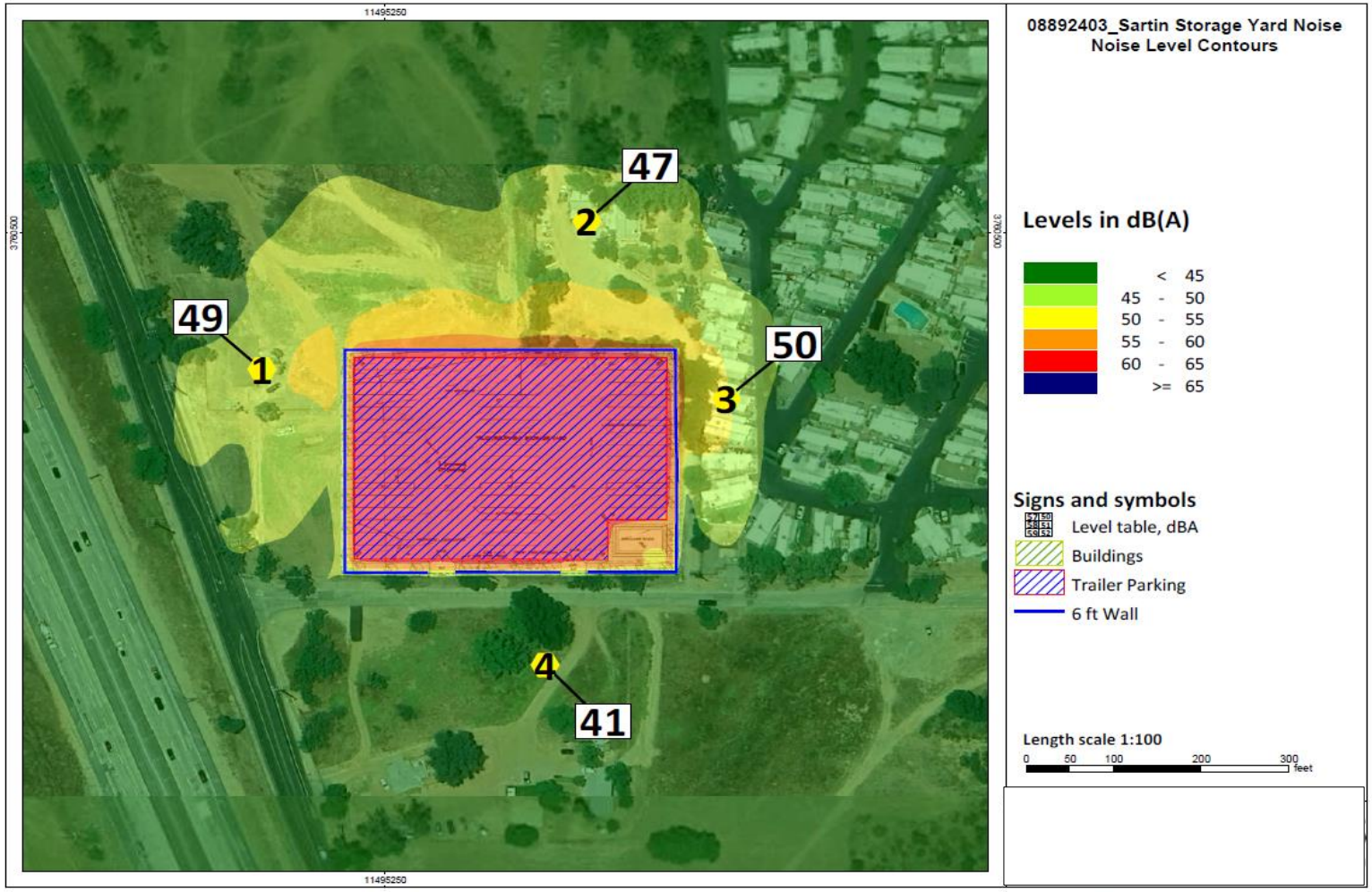
Table 8-2: Worst-Case Predicted Operational Noise Levels (dBA, Leq)

Receptor[1]	Project Noise Level, dBA Leq	City of Calimesa Residential Daytime/Night Noise Limit (dBA)[1]	Exceeds Limit (Day/Night
1	49	55/50	No/No
2	47		No/No
3	50		No/No
4	41		No/No

Notes:
[1] Residential land uses.
[2] Noise levels based on Table N-D: Exterior Noise Level Standards for Non-Transportation Noise.

Figure 8-1

Equivalent Operational Day/Night Noise Level Contours Leq



9.0 Construction Noise & Vibration Impacts

The degree of construction noise may vary for different areas of the project site and also vary depending on the construction activities. Noise levels associated with the construction will vary with the different phases of construction.

9.1 Construction Noise

The Environmental Protection Agency (EPA) has compiled data regarding the noise-generated characteristics of typical construction activities. The data is presented in Table 9-1. These typical construction noise levels are incorporated in the Federal Highway Roadway Construction Noise Model (RCNM) to predict construction noise levels.

Table 9-1: Typical Construction Noise Levels[1]

Earth Moving	
Compactors (Rollers)	73 - 76
Front Loaders	73 - 84
Backhoes	73 - 92
Tractors	75 - 95
Scrapers, Graders	78 - 92
Pavers	85 - 87
Trucks	81 - 94
Materials Handling	
Concrete Mixers	72 - 87
Concrete Pumps	81 - 83
Cranes (Movable)	72 - 86
Cranes (Derrick)	85 - 87
Stationary	
Pumps	68 - 71
Generators	71 - 83
Compressors	75 - 86

Impact Equipment

Type	**Noise Levels (dBA) at 50 Feet**
Saws	71 - 82
Vibrators	68 - 82

Notes:
[1] Referenced Noise Levels from the Environmental Protection Agency (EPA) that are incorporated into the Federal Highway Administration Roadway Construction Noise Model

Construction noise is considered a short-term impact and would be considered significant if construction activities are taken outside the allowable times as described in the City's Municipal Code and if noise levels exceed the City's threshold of 75 dBA.

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. Noise levels will be loudest during grading phase. A likely worst-case construction noise scenario during grading assumes the use of a grader, a dozer, a excavator, and a tractor operating at 230 feet from center of the project site to the nearest sensitive receptor (east residences).

Assuming a usage factor of 40 percent for each piece of equipment, unmitigated noise levels at 230 feet have the potential to reach up to 67 dBA Leq at the nearest sensitive receptors during grading. Noise levels for the other construction phases would be lower and range between 64 to 65 dBA Leq. These noise levels are below the City's Municipal Code Section 8.15.080.B. threshold of 75 dBA. The calculation sheet is provided in Appendix D.

Construction is anticipated to occur during the permissible hours according to the City's Municipal Code. Furthermore, noise reduction measures are provided to reduce construction noise further. The impact is less than significant.

9.2 Construction Vibration

Construction activities can produce a vibration that may be felt by adjacent land uses. The construction of the project would not require the use of equipment such as pile drivers, which are known to generate substantial construction vibration levels. The primary vibration source during construction may be from a bulldozer. A large bulldozer has a vibration impact of 0.089 inches per second peak particle velocity (PPV) at 25 feet, which is perceptible but below any risk of architectural damage.

The fundamental equation used to calculate vibration propagation through average soil conditions and distance is as follows:

$$PPV_{equipment} = PPV_{ref} (100/D_{rec})^n$$

Where: PPV_{ref} = reference PPV at 100ft.
D_{rec} = distance from equipment to receiver in ft.
n = 1.1 (the value related to the attenuation rate through ground)

The thresholds from the Caltrans Transportation and Construction Induced Vibration Guidance Manual in Table 9-2 (below) provide general thresholds and guidelines as to the vibration damage potential from vibratory impacts.

<Table 9-2, next page>

Table 9-2: Guideline Vibration Damage Potential Threshold Criteria

Structure and Condition	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Source: Table 19, Transportation and Construction Vibration Guidance Manual, Caltrans, Sept. 2013.
Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Table 9-3 gives approximate vibration levels for particular construction activities. This data provides a reasonable estimate for a wide range of soil conditions.

Table 9-3: Vibration Source Levels for Construction Equipment[1]

Equipment	Peak Particle Velocity (inches/second) at 25 feet
Large bulldozer	0.089
Loaded trucks	0.076
Small bulldozer	0.003

The greatest source of vibration from construction equipment would result from a large bulldozer during grading activities. A static or pneumatic roller will be used during paving operations. At a distance of 40 feet, one (1) large bulldozer would yield a worst-case 0.053 PPV (in/sec), which is below the Calimesa vibration threshold of 0.0787 in/sec. The impact is less than significant, and no mitigation is required. Calculations sheet is provided in Appendix D.

9.3 Construction Noise Reduction Measures

Construction operations must follow the City's General Plan and the Noise Ordinance, which states that construction, repair, or excavation work performed must occur within the permissible hours. To further ensure that construction activities do not disrupt the adjacent land uses, the following measures should be taken:

9.3.1 Construction should occur during the permissible hours.

9.3.2 During construction, the contractor shall ensure all construction equipment is equipped with appropriate noise-attenuating devices.

9.3.3 The contractor should locate equipment staging areas that will create the greatest distance between construction-related noise/vibration sources and sensitive receptors nearest the project site during all project construction.

9.3.4 Idling equipment should be turned off when not in use.

9.3.5 Equipment shall be maintained so vehicles and their loads are secured from rattling and banging.

9.3.6 Pneumatic and static rollers shall be utilized during paving activities to reduce vibration near sensitive residences.

10.0 References

State of California General Plan Guidelines: 1998. Governor's Office of Planning and Research

City of Calimesa: 2014 General Plan, Chapter 9

City of Calimesa Municipal Code. Chapter 15 Noise and Abatement Control

Federal Transit Administration. Transit Noise and Vibration Impact Assessment Manual. September 2018.

Appendix A: Noise Monitoring Data

24-Hour Continuous Noise Measurement Datasheet

Project: Sartin Storage Yard
Site Address/Location: Calimesa Blvd & Chandler Ave, Calimesa CA
Date: 2/9/2024
Field Tech/Engineer: Jason Schuyler / Francisco Irarrazabal;

General Location: Calimesa Blvd & Chandler Ave
Sound Meter: Pic2 **SN:** P0221031803
Settings: A-weighted, slow, 1-min, 24-hour duration
Meteorological Con.: Temps mid 50's daytime, winds 1 to 20 mph, scatter clouds
Site ID: LT-1

Site Observations: Temperature in the mid 50's during the day, and 30's at night. Gusty winds 1-20 MPH. Meter was located at a fence pole 30 feet from Chandler Ave CL and approx. 340 from I-10 Hwy. The site is vacant and vegetation is observed. Light traffic noise from Chandler Ave & Calimesa Blvd. Main source of noise was Hwy I-10.

Site Topo: Flat
Ground Type: Undeveloped Area, some homes nearby, vacar

Noise Source(s) w/ Distance:
1 - 30' from Chandler Ave CL
1 - 340' from Hwy I-10 CL

Figure 1: LT Monitoring Locations





Figure 2: LT-1 Photo



24-Hour Noise Measurement Datasheet - Cont.

Project: Sartin Storage Yard **Day:** 1 of 1

Site Address/Location: Calimesa Blvd & Chandler Ave, Calimesa CA

Site ID: LT-1

Date	Start	Stop	Leq	Lmax	Lmin	L2	L8	L25	L50	L90
2/9/2024	12:00 AM	1:00 AM	63.5	66.9	58.7	66.4	65.7	64.3	63.4	60.5
2/9/2024	1:00 AM	2:00 AM	63.1	67.2	55.5	66.4	65.1	64.0	63.0	60.4
2/9/2024	2:00 AM	3:00 AM	62.5	68.7	55.0	66.6	64.9	63.4	61.5	58.7
2/9/2024	3:00 AM	4:00 AM	63.9	67.8	58.1	67.5	66.2	64.8	63.5	60.6
2/9/2024	4:00 AM	5:00 AM	65.9	69.7	58.3	68.4	67.7	66.9	65.8	62.7
2/9/2024	5:00 AM	6:00 AM	67.3	69.5	64.6	69.2	68.6	68.0	67.4	65.8
2/9/2024	6:00 AM	7:00 AM	68.2	70.8	64.2	70.5	69.8	68.6	68.4	66.0
2/9/2024	7:00 AM	8:00 AM	64.9	67.9	60.1	67.4	66.8	65.8	65.0	62.2
2/9/2024	8:00 AM	9:00 AM	66.1	68.8	60.9	68.4	67.7	66.9	66.0	63.6
2/9/2024	9:00 AM	10:00 AM	65.6	67.8	62.2	67.8	67.3	66.3	65.5	63.5
2/9/2024	10:00 AM	11:00 AM	65.0	67.7	60.9	67.3	66.6	65.6	64.9	63.3
2/9/2024	11:00 AM	12:00 PM	64.9	72.6	61.9	68.4	65.8	65.0	64.3	63.3
2/9/2024	12:00 PM	1:00 PM	65.7	68.3	61.4	68.0	67.5	66.7	65.6	63.3
2/9/2024	1:00 PM	2:00 PM	65.3	68.8	62.0	67.5	67.2	65.9	65.2	63.1
2/9/2024	2:00 PM	3:00 PM	65.5	68.9	62.7	67.2	66.8	65.9	65.3	64.0
2/9/2024	3:00 PM	4:00 PM	64.3	68.4	60.3	67.4	66.2	65.2	64.0	61.9
2/9/2024	4:00 PM	5:00 PM	67.3	68.9	65.3	68.7	68.3	67.9	67.2	66.0
2/9/2024	5:00 PM	6:00 PM	66.7	69.9	64.5	68.3	67.9	67.4	66.5	65.3
2/9/2024	6:00 PM	7:00 PM	66.6	69.5	64.3	68.8	68.0	67.2	66.3	65.1
2/9/2024	7:00 PM	8:00 PM	65.4	68.2	60.8	68.1	67.4	66.6	65.0	63.3
2/9/2024	8:00 PM	9:00 PM	64.2	68.7	60.3	66.9	66.1	64.7	63.7	61.9
2/9/2024	9:00 PM	10:00 PM	63.7	68.9	58.3	66.9	65.6	64.2	63.4	61.6
2/9/2024	10:00 PM	11:00 PM	62.7	65.7	58.5	65.5	64.6	63.5	62.3	60.5
2/9/2024	11:00 PM	12:00 AM	62.7	66.4	55.3	65.6	64.9	63.4	62.5	59.9

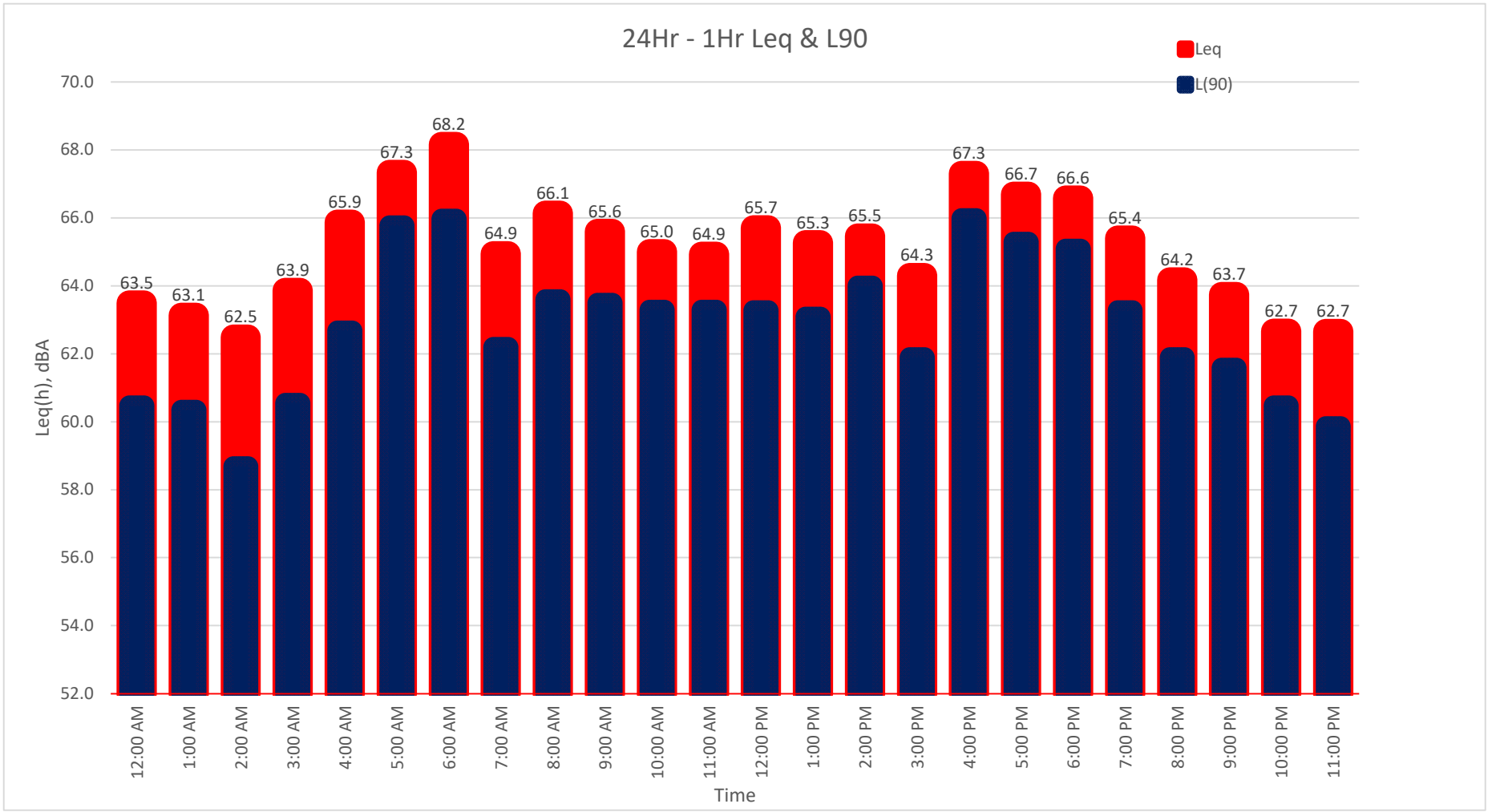
CNEL 71.7

24-Hour Continuous Noise Measurement Datasheet - Cont.

Project: Sartin Storage Yard **Day:** 1 of 1

Site Address/Location: Calimesa Blvd & Chandler Ave, Calimesa CA

Site ID: LT-1



Appendix B: FHWA Model Output

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

PROJECT:	Sartin Storage Yard	JOB #:	0889-24-03
ROADWAY:	Calimesa Blvd	DATE:	13-Feb-24
LOCATION:	City of Calimesa - EXISTING - NOISE CONTOURS	ENGINEER:	F. Irarrazabal

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	18,300	
SPEED =	40	
PK HR % =	10	
NEAR LANE/FAR LANE DIS	25	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	1,830	

RECEIVER INPUT DATA

RECEIVER DISTANCE =	60	
DIST C/L TO WALL =	0	
RECEIVER HEIGHT =	5.0	
WALL DISTANCE FROM RECEIVER	60	
PAD ELEVATION =	0.0	
ROADWAY VIEW: LF ANGLE=	-90	
RT ANGLE=	90	
DF ANGLE=	180	

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL:	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.755	0.140	0.105	0.9742
MEDIUM TRUCK	0.489	0.022	0.489	0.0184
HEAVY TRUCKS	0.473	0.054	0.473	0.0074

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	58.76	- -
MEDIUM TRUCKS	4.0	58.69	- -
HEAVY TRUCKS	8.0	58.76	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	66.2	64.2	62.9	56.9	65.3	65.9
MEDIUM TRUCKS	57.9	54.0	46.6	55.3	61.4	61.5
HEAVY TRUCKS	58.8	54.8	51.4	56.0	62.2	62.3
NOISE LEVELS (dBA)	67.4	65.0	63.3	60.9	68.1	68.4

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	66.2	64.2	62.9	56.9	65.3	65.9
MEDIUM TRUCKS	57.9	54.0	46.6	55.3	61.4	61.5
HEAVY TRUCKS	58.8	54.8	51.4	56.0	62.2	62.3
NOISE LEVELS (dBA)	67.4	65.0	63.3	60.9	68.1	68.4

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	47	102	219	473
LDN	45	96	207	446

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

PROJECT:	Sartin Storage Yard	JOB #:	0889-24-03
ROADWAY:	Calimesa Blvd	DATE:	13-Feb-24
LOCATION:	City of Calimesa - EXISTING + PROJECT - NOISE CONTOURS	ENGINEER:	F. Irarrazabal

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	18,384	
SPEED =	40	
PK HR % =	10	
NEAR LANE/FAR LANE DIS	25	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	1,838	

RECEIVER INPUT DATA

RECEIVER DISTANCE =	60	
DIST C/L TO WALL =	0	
RECEIVER HEIGHT =	5.0	
WALL DISTANCE FROM RECEIVER	60	
PAD ELEVATION =	0.0	
ROADWAY VIEW: LF ANGLE=	-90	
RT ANGLE=	90	
DF ANGLE=	180	

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL:	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.755	0.140	0.105	0.9742
MEDIUM TRUCK	0.489	0.022	0.489	0.0184
HEAVY TRUCKS	0.473	0.054	0.473	0.0074

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	58.76	- -
MEDIUM TRUCKS	4.0	58.69	- -
HEAVY TRUCKS	8.0	58.76	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	66.2	64.2	62.9	56.9	65.3	65.9
MEDIUM TRUCKS	57.9	54.0	46.6	55.3	61.5	61.5
HEAVY TRUCKS	58.8	54.8	51.4	56.0	62.2	62.3
NOISE LEVELS (dBA)	67.5	65.0	63.3	60.9	68.1	68.5

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	66.2	64.2	62.9	56.9	65.3	65.9
MEDIUM TRUCKS	57.9	54.0	46.6	55.3	61.5	61.5
HEAVY TRUCKS	58.8	54.8	51.4	56.0	62.2	62.3
NOISE LEVELS (dBA)	67.5	65.0	63.3	60.9	68.1	68.5

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	47	102	220	474
LDN	45	96	208	448

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

PROJECT:	Sartin Storage Yard	JOB #:	0889-24-03
ROADWAY:	Chandler Ave	DATE:	13-Feb-24
LOCATION:	City of Calimesa - EXISTING - NOISE CONTOURS	ENGINEER:	F. Irarrazabal

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	1,000	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIS	25	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	100	

RECEIVER INPUT DATA

RECEIVER DISTANCE =	60	
DIST C/L TO WALL =	0	
RECEIVER HEIGHT =	5.0	
WALL DISTANCE FROM RECEIVER	60	
PAD ELEVATION =	0.0	
ROADWAY VIEW: LF ANGLE=	-90	
RT ANGLE=	90	
DF ANGLE=	180	

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL:	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.755	0.140	0.105	0.9742
MEDIUM TRUCK	0.489	0.022	0.489	0.0184
HEAVY TRUCKS	0.473	0.054	0.473	0.0074

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	58.76	- -
MEDIUM TRUCKS	4.0	58.69	- -
HEAVY TRUCKS	8.0	58.76	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	47.7	45.7	44.4	38.4	46.8	47.4
MEDIUM TRUCKS	42.1	38.2	30.8	39.5	45.6	45.7
HEAVY TRUCKS	44.3	40.2	36.8	41.5	47.7	47.8
NOISE LEVELS (dBA)	50.1	47.3	45.2	44.7	51.6	51.8

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	47.7	45.7	44.4	38.4	46.8	47.4
MEDIUM TRUCKS	42.1	38.2	30.8	39.5	45.6	45.7
HEAVY TRUCKS	44.3	40.2	36.8	41.5	47.7	47.8
NOISE LEVELS (dBA)	50.1	47.3	45.2	44.7	51.6	51.8

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	4	8	17	37
LDN	4	8	16	35

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

PROJECT:	Sartin Storage Yard	JOB #:	0889-24-03
ROADWAY:	Chandler Ave	DATE:	13-Feb-24
LOCATION:	City of Calimesa - EXISTING + PROJECT - NOISE CONTOURS	ENGINEER:	F. Irarrazabal

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	1,084	
SPEED =	25	
PK HR % =	10	
NEAR LANE/FAR LANE DIS	25	
ROAD ELEVATION =	0.0	
GRADE =	0.0	%
PK HR VOL =	108	

RECEIVER INPUT DATA

RECEIVER DISTANCE =		60
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5.0
WALL DISTANCE FROM RECEIVER		60
PAD ELEVATION =		0.0
ROADWAY VIEW:	LF ANGLE=	-90
	RT ANGLE=	90
	DF ANGLE=	180

SITE CONDITIONS

AUTOMOBILES =	15	
MEDIUM TRUCKS =	15	(10 = HARD SITE, 15 = SOFT SITE)
HEAVY TRUCKS =	15	

WALL INFORMATION

HTH WALL:	0.0	
AMBIENT=	0.0	
BARRIER =	0	(0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.755	0.140	0.105	0.9742
MEDIUM TRUCK	0.489	0.022	0.489	0.0184
HEAVY TRUCKS	0.473	0.054	0.473	0.0074

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	58.76	- -
MEDIUM TRUCKS	4.0	58.69	- -
HEAVY TRUCKS	8.0	58.76	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	48.0	46.0	44.7	38.7	47.1	47.7
MEDIUM TRUCKS	42.5	38.6	31.1	39.8	46.0	46.0
HEAVY TRUCKS	44.6	40.6	37.2	41.8	48.0	48.1
NOISE LEVELS (dBA)	50.4	47.7	45.6	45.1	51.9	52.2

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	48.0	46.0	44.7	38.7	47.1	47.7
MEDIUM TRUCKS	42.5	38.6	31.1	39.8	46.0	46.0
HEAVY TRUCKS	44.6	40.6	37.2	41.8	48.0	48.1
NOISE LEVELS (dBA)	50.4	47.7	45.6	45.1	51.9	52.2

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	4	8	18	39
LDN	4	8	17	37

Appendix C: Sound Plan Model Input and Output

Sartin Storage Yard Noise
Contribution spectra - 001 - Sartin Storage Yard: Outdoor SP

Time slice	Sum dB(A)	25Hz dB(A)	31.5Hz dB(A)	40Hz dB(A)	50Hz dB(A)	63Hz dB(A)	80Hz dB(A)	100Hz dB(A)	125Hz dB(A)	160Hz dB(A)	200Hz dB(A)	250Hz dB(A)	315Hz dB(A)	400Hz dB(A)	500Hz dB(A)	630Hz dB(A)	800Hz dB(A)	1kHz dB(A)	1.25kHz dB(A)	1.6kHz dB(A)	2kHz dB(A)	2.5kHz dB(A)	3.15kHz dB(A)	4kHz dB(A)	5kHz dB(A)	6.3kHz dB(A)	8kHz dB(A)	10kHz dB(A)	12.5kHz dB(A)	16kHz dB(A)	20kHz dB(A)	
Receiver R1 Fl G Lr,lim dB(A) Leq,d 48.5 dB(A)																																
Leq,d	48.5	-6.0	-1.2	3.1	4.8	9.8	15.3	17.4	32.6	23.3	24.1	25.1	28.2	32.3	33.9	34.6	39.2	43.4	38.8	38.8	38.4	36.1	33.7	31.1	28.4	23.3	16.8	10.0	1.7	-8.0	-18.1	
Receiver R2 Fl G Lr,lim dB(A) Leq,d 47.1 dB(A)																																
Leq,d	47.1	-7.1	-2.3	2.0	3.6	8.7	14.1	16.1	31.3	21.9	22.8	23.7	26.8	30.9	32.4	33.1	37.8	42.0	37.4	37.4	37.0	34.6	32.0	29.4	26.3	20.8	13.6	5.5	-4.4	-16.2	-28.8	
Receiver R3 Fl G Lr,lim dB(A) Leq,d 50.4 dB(A)																																
Leq,d	50.4	-4.1	0.7	4.9	6.5	11.5	16.9	19.1	34.1	24.5	25.8	26.8	29.9	33.8	35.6	36.4	40.8	45.1	40.6	40.6	40.4	38.2	35.9	33.6	31.2	26.6	20.8	14.7	7.6	-0.7	-9.2	
Receiver R4 Fl G Lr,lim dB(A) Leq,d 40.7 dB(A)																																
Leq,d	40.7	-6.1	-1.5	2.6	4.1	8.9	14.0	15.8	30.5	20.5	21.3	21.8	24.4	27.2	28.2	28.4	31.4	35.0	30.0	29.6	28.9	26.2	23.6	20.9	18.0	12.8	6.3	-0.6	-8.9	-18.8	-29.2	

Source group	Source type	Tr. lane	Leq,d dB(A)	A dB	
Receiver R1 Fl G Lr,lim dB(A) Leq,d 48.5 dB(A)					
Default parking lot noise	PLot		48.5	0.0	
Receiver R2 Fl G Lr,lim dB(A) Leq,d 47.1 dB(A)					
Default parking lot noise	PLot		47.1	0.0	
Receiver R3 Fl G Lr,lim dB(A) Leq,d 50.4 dB(A)					
Default parking lot noise	PLot		50.4	0.0	
Receiver R4 Fl G Lr,lim dB(A) Leq,d 40.7 dB(A)					
Default parking lot noise	PLot		40.7	0.0	

Sartin Storage Yard Noise
Octave spectra of the sources in dB(A) - 001 - Sartin Storage Yard: Outdoor SP

Name	Source type	l or A	Li	R'w	L'w	Lw	KI	KT	LwMax	DO-Wall	Time histogram	Emission spectrum	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	16kHz
		m,m²	dB(A)	dB	dB(A)	dB(A)	dB	dB	dB(A)	dB			dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
Parking	PLot	7939.15			61.0	100.0	0.0	0.0		0	Events per Hour	Idling Semi Truck 10' - Calibrated	67.6	86.8	85.5	92.1	96.7	93.4	88.4	79.9	67.2

Appendix D: Construction Noise & Vibration Output

Receptor - Mobile Homes along eastern area

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Edge of Site to Receptor, feet	Center of Site to Receptor, feet	Item Usage Percent[1]	Ground Factor[2]	Usage Factor	Receptor Item Lmax, dBA	Recptor. Item Leq, dBA
SITE PREP									
Dozer	1	82	40	230	40	0.66	0.40	84.6	60.4
Tractor	1	84	40	230	40	0.66	0.40	86.6	62.4
							Log Sum	86.6	64.5
GRADE									
Grader	1	84	40	230	40	0.66	0.40	86.6	62.4
Excavator	1	81	40	230	40	0.66	0.40	83.6	59.4
Tractor	1	84	40	230	40	0.66	0.40	86.6	62.4
Dozer	1	82	40	230	40	0.66	0.40	84.6	60.4
								86.6	67.3
PAVE									
Tractor	1	84	40	230	40	0.66	0.4	86.6	62.4
Paver	1	77	40	230	50	0.66	0.50	79.6	56.4
Paving Equipment	1	83	40	230	20	0.66	0.20	85.6	58.4
Roller	2	80	40	230	20	0.66	0.20	82.6	55.4
Concrete Mixer Truck	1	79	40	230	40	0.66	0.40	81.6	57.4
								86.6	63.7

[1]FHWA Construction Noise Handbook: Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

VIBRATION LEVEL IMPACT

Project:	Sartin Storage Yard	Date: 2/21/24
Source:	Large Bulldozer	
Scenario:	Unmitigated daytime	
Location:	Calimesa Blvd & Chandler Ave	
Address:	Calimesa CA	

PPV = PPVref(25/D)^n (in/sec)

DATA INPUT

Equipment = Type	2	Large Bulldozer	INPUT SECTION IN BLUE
Equipment Quantity = 1			
PPVref =	0.089	Reference PPV (in/sec) at 25 ft.	
D =	40.00	Distance from Equipment to Receiver (ft)	
n =	1.10	Vibration attenuation rate through the ground	

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.

DATA OUT RESULTS

PPV =	**0.053**	IN/SEC	OUTPUT IN RED
	82	VdB	