27195 ALMOND AVENUE WAREHOUSE PROJECT NOISE IMPACT ANALYSIS

County of San Bernardino

October 3, 2022

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Traffic Engineering ● Transportation Planning ● Parking ● Noise & Vibration
Air Quality ● Global Climate Change ● Health Risk Assessment

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Project No. 19518

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EXECUTIVE SUMMARY

The purpose of this report is to provide an assessment of the noise impacts associated with development and operation of the proposed 27195 Almond Avenue Warehouse project and to identify mitigation measures that may be necessary to reduce those impacts. The noise issues related to the proposed land use and development have been evaluated in light of applicable federal, state, and local policies, including those of the County of San Bernardino.

Although this is a technical report, effort has been made to write the report clearly and concisely. A list of acronyms and glossary are provided in Appendix A and Appendix B of this report to assist the reader with technical terms related to noise analysis.

Project Location

The 9.54-acre project site is located at 27195 Almond Avenue, in the unincorporated area of Redlands known as the "Donut-Hole," in the County of San Bernardino, California. The project site is currently vacant.

Project Description

The proposed project involves construction of a new 208,000 square foot building with approximately 6,000 square feet of office space and 202,000 square feet of warehouse use, 24 dock doors, and associated parking for automobiles and trailers. Vehicular access is proposed via two driveways on Almond Avenue.

Construction Impacts

On-Site Construction

Modeled unmitigated construction noise levels reach up to 71 dBA L_{eq} at the nearest multi-family residential property line to the south of the project site, 62 dBA L_{eq} at the nearest church property line to the north of the project site, and 60 dBA L_{eq} at the nearest multi-family residential property line to the northeast of the project site.

Construction noise sources are regulated within Section 83.01.080(g)(3) of the County of San Bernardino's Development Code which prohibits construction activities other than between the hours of 7:00 AM and 7:00 PM, except Sundays and Federal holidays. Project construction will not occur outside of the hours outlined as "exempt" in County of San Bernardino Development Code Section 83.01.080(g)(3) and therefore, will not result in or generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance.

Impacts would be less than significant, and no mitigation is required.

In addition to adherence to the County of San Bernardino's Development Code which limits the construction hours of operation, the project applicant will include the following Best Management Practices (BMPs) on project plans and in contract specifications to further reduce construction noise emanating from the proposed project:

Construction Noise - Best Management Practices

1. All construction equipment, fixed or mobile, will be equipped with properly operating and maintained mufflers, consistent with manufacturer standards.

2. All stationary construction equipment will be placed so that emitted noise is directed away from the noise sensitive receptors nearest the project site.

3. As applicable, shut off all equipment when not in use.

4. To the degree possible, equipment staging will be located in areas that create the greatest distance between construction-related noise and vibration sources and sensitive receptors surrounding the project site.

5. Jackhammers, pneumatic equipment, and all other portable stationary noise sources will be directed away from existing residences east of the project site. Either one-inch plywood or sound blankets can be utilized for this purpose. They should reach up from the ground and block the line of sight between equipment and the nearest off-site residences. The shielding should be without holes and cracks.

6. No amplified music and/or voice will be allowed on the project site.

7. Haul truck deliveries will not occur outside of the hours presented as exempt for construction per County of San Bernardino Development Code within Section 83.01.080(g)(3).

Off-Site Construction

Construction truck trips would occur throughout the construction period. Given the project site's proximity to the 10 and 210 Freeways, it is anticipated that vendor and/or haul truck traffic would take the most direct route to the appropriate freeway ramps.

According to the Federal Highway Administration (FHWA), the traffic volumes need to be doubled in order to increase noise levels by 3 dBA CNEL.[1] The estimated existing average daily trips along Alabama Street are approximately 11,873 average daily vehicle trips and along Almond Avenue are approximately 6,480 average daily vehicle trips.[2] As shown in the CalEEMod output files provided in the Air Quality Analysis prepared for the proposed project (Lilburn 2022) the greatest number of construction related vehicle trips per day would be during building construction at up to approximately 122 vehicle trips per day (87.4 for worker trips and 34.1 for vendor trips). Therefore, the addition of project vendor/haul trucks and worker vehicles per day along off-site roadway segments would not be anticipated to result in a doubling of traffic volumes. Off-site project generated construction vehicle trips would result in a negligible noise level increase and would not result in a substantial increase in ambient noise levels. Impacts would be less than significant. No mitigation measures are required.

Project Operational Noise

Operational Noise Levels -Leq

The SoundPLAN noise model was utilized to estimate peak hour operation of the project in order to determine if it is likely to result in substantial increases in ambient noise levels. A description of each noise source and model parameters are discussed in Section 5 of this report. As shown in Figure 6, with a nine (9) foot concrete wall surrounding the loading and unloading area, operational noise levels would range between 26 and 45 dBA Leq at nearby receptors and are not likely to exceed residential daytime or nighttime noise standards (55 and 45 dBA Leq, respectively) at the residential land uses located south of the project site; nor will they exceed the exterior noise standard for adjacent industrial land uses (70 dBA Leq for both day and nighttime). This impact would be less than significant. No mitigation measures are required.

[1] Federal Highway Administration, Highway Noise Prediction Model, December 1978.

[2] Existing average daily vehicle traffic along Almond Avenue was estimated using existing ambient noise measurements (see Table 1, STNM2). Existing average daily vehicle traffic along Alabama Avenue was obtained from San Bernardino Countywide Plan Transportation Existing Conditions Report, Table 3 - San Bernardino County Existing ADT Counts (March 2017), the segment of Alabama Street north of San Bernardino Avenue was utilized for existing average daily vehicle traffic as it is the only segment provided for Alabama Street.

Operational Noise Levels - Lmax

A point noise source representative of larger truck venting air brakes (110 L_w) was utilized to model a maximum noise event near the residential properties south of the project site. As shown on Figure 7, with the proposed 9-foot concrete wall, operational noise levels may reach up to 70 dBA L_{max} at the residential property line and would not exceed the daytime maximum noise standard of 75 dBA L_{max}; but could exceed the nighttime Lmax standard of 65 at the property line. Considering that there are no outdoor recreational areas affected by project noise, it is reasonable to apply the maximum nighttime noise criteria at the actual residential buildings. As shown in Figure 9, exterior nighttime maximum noise levels at the existing residential buildings would reach up to 64 dB Lmax and would not exceed the nighttime maximum noise standard of 65. Typical residential construction provides 20 dB of exterior to interior reduction with windows closed so interior noise levels are not expected to exceed 45 dB. If it is not acceptable to the County to adjust the receptor from the property line to the residential buildings, then it is recommended that signs be installed prohibiting the use of air compression brakes on-site. Either scenario would result in acceptable nighttime average and maximum noise levels. A higher barrier is not recommended because at 14-feet in height, the maximum noise event could still exceed 65 dBA Leq at the property line. This impact would be less than significant with mitigation depending on whether the City finds the analysis at the actual buildings acceptable. Otherwise, signs prohibiting the use of compression brakes on-site would need to be installed to reduce impacts to less than significant.

Groundborne Vibration Impacts

The nearest off-site structures include the multi-family residential buildings located to the south, with structures located as close as approximately 55 feet to the south of the project's southern property line; the commercial structures located to the south and east, with structures located as close as approximately 58 feet to the south of the project's southern property line and 62 feet to the east of the project's eastern property line; and the industrial structures to the west, north, and northeast, with structures located as close as approximately 291 feet to the west of the project's western property line, 198 feet to the north of the project's northern property line, and 162 feet northeast of the project's northern property line. Therefore, the nearest off-site structure is the multi-family residential structures located approximately 55 feet to the south of the southern project property line. At 55 feet, use of a vibratory roller would be expected to generate a PPV of 0.064 in/sec and a bulldozer would be expected to generate a PPV of 0.027 in/sec. Temporary vibration levels associated with project construction would not exceed the threshold at which there is a risk to "architectural" damage to older residential structures PPV of 0.3 in/sec PPV nor the County's threshold of 0.2 in/sec PPV. In addition, it is anticipated that project construction will occur within the exempt hours as identified in Section 83.01.090(c) of the County's Development Code. The project does not propose any non-construction related sources of ground-borne vibration. Impacts would be less than significant. No mitigation is required.

Annoyance - Groundborne vibration becomes strongly perceptible to sensitive receptors at a level of 0.1 in/sec PPV. Therefore, project construction would not cause annoyance to the residential uses to the south. Impacts from vibration related annoyance would be less than significant. No mitigation is required.

1. INTRODUCTION

This section describes the purpose of this noise impact analysis, project location, proposed development, and study area. Figure 1 shows the project location map and Figure 2 illustrates the project site plan.

PURPOSE AND OBJECTIVES

The purpose of this report is to provide an assessment of the noise impacts resulting from development of the proposed 27195 Almond Avenue Warehouse project and to identify mitigation measures that may be necessary to reduce those impacts. The noise issues related to the proposed land use and development have been evaluated in light of applicable federal, state, and local policies, including those of the County of San Bernardino.

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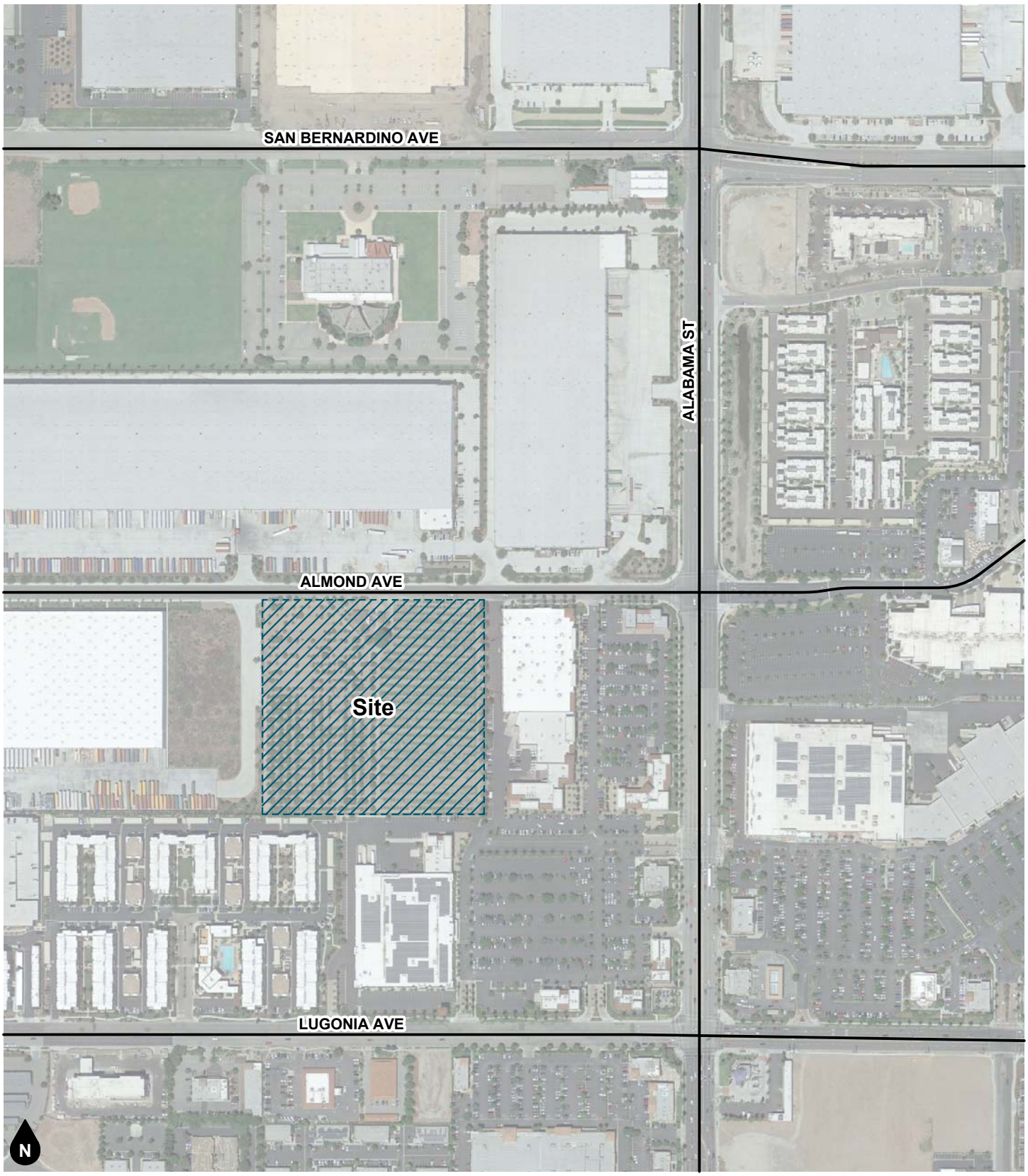


Figure 1
Project Location Map

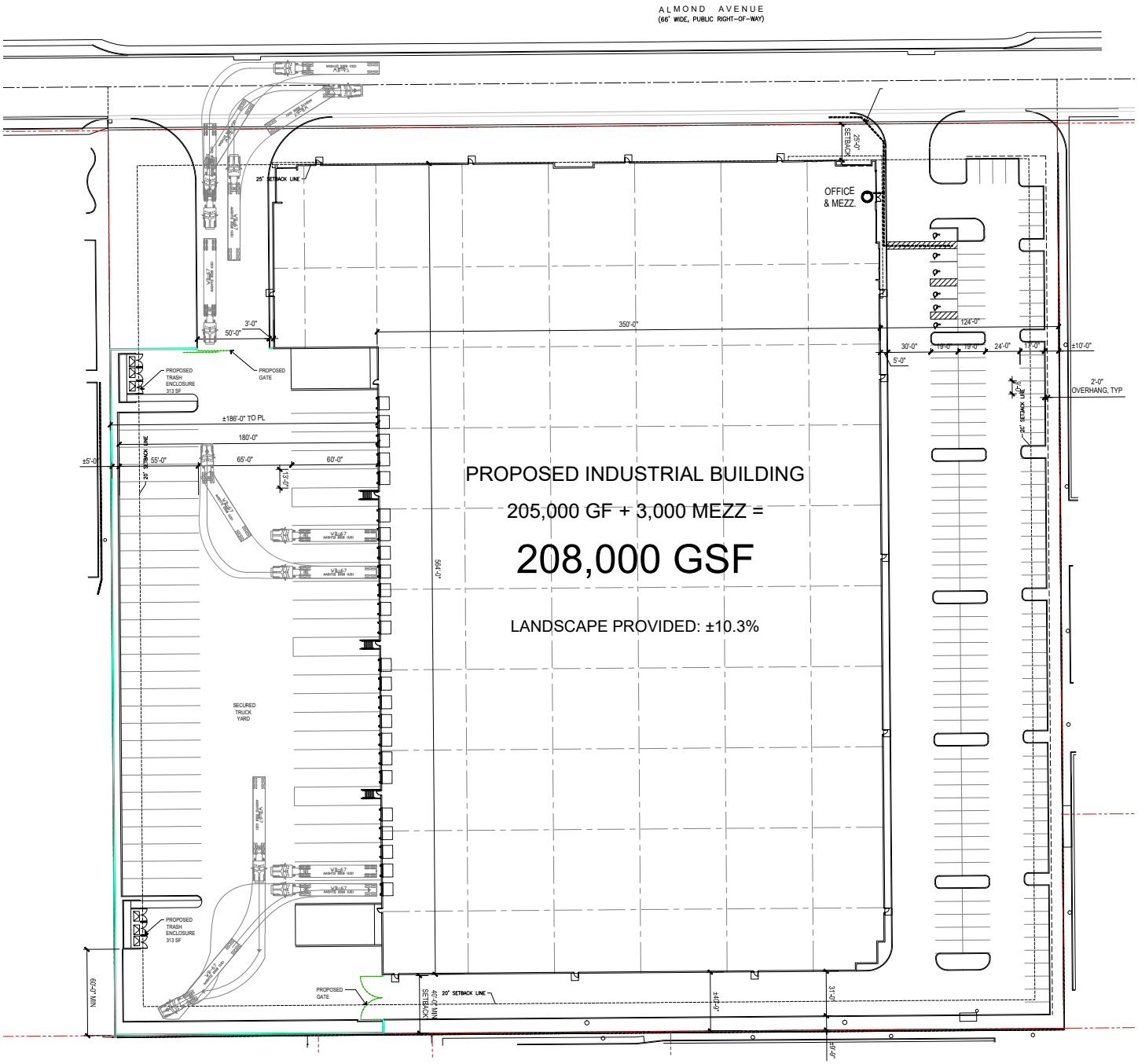


Figure 2
Site Plan

2. NOISE AND VIBRATION FUNDAMENTALS

NOISE FUNDAMENTALS

Sound is a pressure wave created by a moving or vibrating source that travels through an elastic medium such as air. Noise is defined as unwanted or objectionable sound. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance, and in extreme circumstances, hearing impairment.

Commonly used noise terms are presented in Appendix B. The unit of measurement used to describe a noise level is the decibel (dB). The human ear is not equally sensitive to all frequencies within the sound spectrum. Therefore, the "A-weighted" noise scale, which weights the frequencies to which humans are sensitive, is used for measurements. Noise levels using A-weighted measurements are written dB(A) or dBA.

From the noise source to the receiver, noise changes both in level and frequency spectrum. The most obvious is the decrease in noise as the distance from the source increases. The manner in which noise reduces with distance depends on whether the source is a point or line source as well as ground absorption, atmospheric effects, and refraction, and shielding by natural and manmade features. Sound from point sources, such as air conditioning condensers, radiates uniformly outward as it travels away from the source in a spherical pattern. The noise drop-off rate associated with this geometric spreading is 6 dBA per each doubling of the distance (dBA/DD). Transportation noise sources such as roadways are typically analyzed as line sources, since at any given moment the receiver may be impacted by noise from multiple vehicles at various locations along the roadway. Because of the geometry of a line source, the noise drop-off rate associated with the geometric spreading of a line source is 3 dBA/DD.

Decibels are measured on a logarithmic scale, which quantifies sound intensity in a manner similar to the Richter scale used for earthquake magnitudes. Thus, a doubling of the energy of a noise source, such as a doubled traffic volume, would increase the noise levels by 3 dBA; halving of the energy would result in a 3 dBA decrease. Figure 3 shows the relationship of various noise levels to commonly experienced noise events.

Average noise levels over a period of minutes or hours are usually expressed as dBA L_{eq}, or the equivalent noise level for that period of time. For example, $L_{eq(3\text{-}hr)}$ would represent a 3-hour average. When no period is specified, a one-hour average is assumed.

Noise standards for land use compatibility are stated in terms of the Community Noise Equivalent Level (CNEL) and the Day-Night Average Noise Level (DNL). CNEL is a 24-hour weighted average measure of community noise. CNEL is obtained by adding five decibels to sound levels in the evening (7:00 PM to 10:00 PM), and by adding ten decibels to sound levels at night (10:00 PM to 7:00 AM). This weighting accounts for the increased human sensitivity to noise during the evening and nighttime hours. DNL is a very similar 24-hour average measure that weights only the nighttime hours.

It is widely accepted that the average healthy ear can barely perceive changes of 3 dBA; that a change of 5 dBA is readily perceptible, and that an increase (decrease) of 10 dBA sounds twice (half) as loud. This definition is recommended by the California Department of Transportation's Technical Noise Supplement to the Traffic Noise Analysis Protocol (2013).

VIBRATION FUNDAMENTALS

The way in which vibration is transmitted through the earth is called propagation. Propagation of earthborn vibrations is complicated and difficult to predict because of the endless variations in the soil through which waves travel. 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.

Compression waves, or P-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. Shear waves, or S-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 energy is spread over an ever-increasing area such that the energy level striking a given point is reduced with the distance from the energy source. This geometric spreading loss is inversely proportional to the square of the distance. Wave energy is also reduced with distance as a result of material damping in the form of internal friction, soil layering, and void spaces. The amount of attenuation provided by material damping varies with soil type and condition as well as the frequency of the wave.

Vibration amplitudes are usually expressed as either peak particle velocity (PPV) or the root mean square (RMS) velocity. The PPV is defined as the maximum instantaneous peak of the vibration signal in inches per second. The RMS of a signal is the average of the squared amplitude of the signal in vibration decibels (VdB), ref one micro-inch per second. The Federal Railroad Administration uses the abbreviation "VdB" for vibration decibels to reduce the potential for confusion with sound decibel.

PPV is appropriate for evaluating the potential of building damage and VdB is commonly used to evaluate human response. Decibel notation acts to compress the range of numbers required in measuring vibration. Similar to the noise descriptors, L_{eq} and L_{max} can be used to describe the average vibration and the maximum vibration level observed during a single vibration measurement interval. Figure 4 illustrates common vibration sources and the human and structural responses to ground-borne vibration. As shown in the figure, the threshold of perception for human response is approximately 65 VdB; however, human response to vibration is not usually substantial unless the vibration exceeds 70 VdB. Vibration tolerance limits for sensitive instruments such as magnetic resonance imaging (MRI) or electron microscopes could be much lower than the human vibration perception threshold.

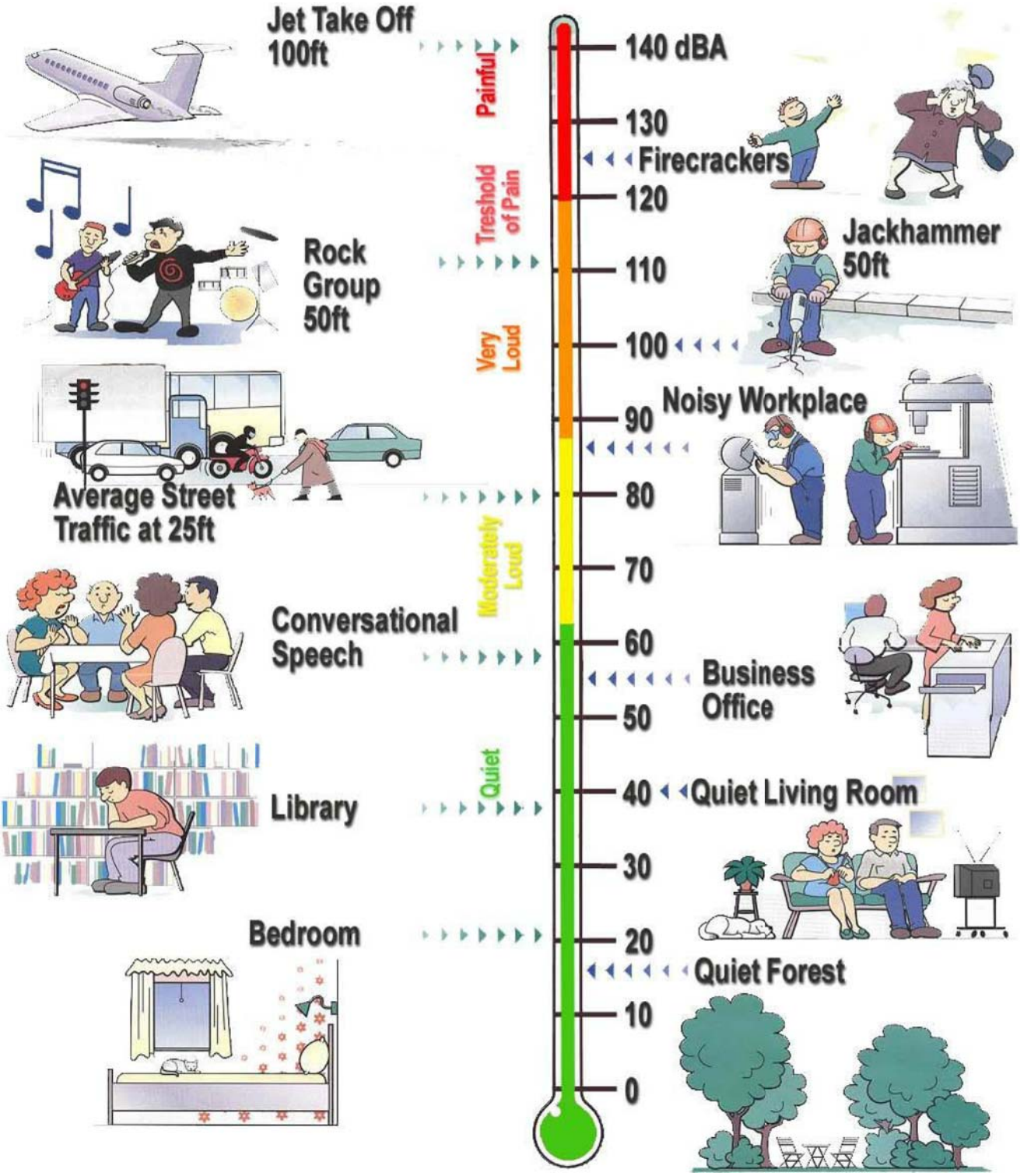
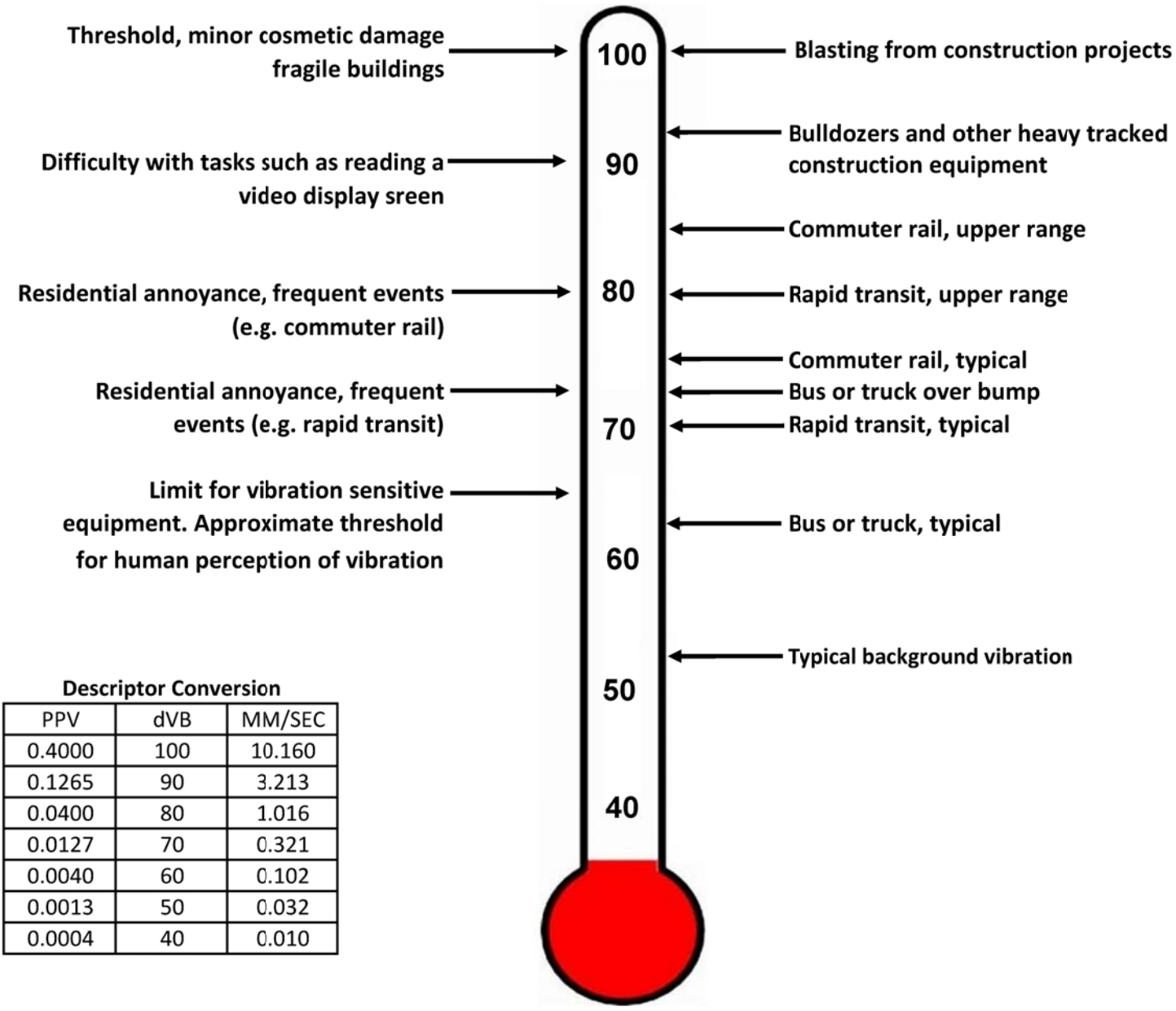


Figure 3
Weighted Sound Levels in Common Environments

Source: Bruel & Kjaer 2001



Descriptor Conversion

PPV	dVB	MM/SEC
0.4000	100	10.160
0.1265	90	3.213
0.0400	80	1.016
0.0127	70	0.321
0.0040	60	0.102
0.0013	50	0.032
0.0004	40	0.010

Source: FRA, 2012. Federal Railroad Administration High-Speed Ground Transportation Noise and Vibration Impact Assessment. Office of Railroad Policy Development, Washington, D.C. DOT/FRA/ORD-12/15. September.

Figure 4
Typical Levels of Groundborne Vibration

3. EXISTING NOISE ENVIRONMENT

EXISTING LAND USES AND SENSITIVE RECEPTORS

The project site is bordered by industrial uses to the west, Almond Avenue to the north, commercial uses to the east, and multi-family residential and commercial uses to the south of the project site.

The State of California defines sensitive receptors as those land uses that require serenity or are otherwise adversely affected by noise events or conditions. Schools, libraries, churches, hospitals, single and multiple-family residential, including transient lodging, motels and hotel uses make up the majority of these areas. Sensitive land uses that may be affected by project noise include the existing multi-family residential uses located adjacent to the south and approximately 865 feet to the northeast (across intersection of Alabama Street and Almond Avenue) of the project site. The Packinghouse, a church use with associated outdoor recreational areas, is also located approximately 691 feet north of the project site.

AMBIENT NOISE MEASUREMENTS

An American National Standards Institute (ANSI Section S1.4 2014 Class 1) Larson Davis model LxT sound level meter was used to document existing ambient noise levels. In order to document existing ambient noise levels in the project area, five (5) 15-minute daytime noise measurements were taken between 1:46 PM and 4:41 PM on June 6, 2022. In addition, one (1) long-term 24-hour noise measurement was also taken from June 6, 2022, to June 7, 2022. Field worksheets and noise measurement output data are included in Appendix C.

As shown in Figure 5, the noise meter was placed at the following locations:

- STNM1: represents the existing noise environment of the industrial use located to the west of the project site (27081 Almond Avenue, Redlands). The noise meter was placed along the western boundary of the project site.

- STNM2: represents the existing noise environment of the industrial use located to the north of the project site and the existing residential use on the project site (27195 Almond Avenue, Redlands). The noise meter was placed just south of the industrial use along the northern side of Almond Avenue.

- STNM3: represents the existing noise environment of the commercial uses to the east of the project site (9940 Alabama Street, Redlands). The noise meter was placed just east of the project site along the western boundary of the commercial uses.

- STNM4: represents the existing noise environment of the multi-family residential uses located at the northeast corner of the intersection of Alabama Street and Almond Avenue. The noise meter was placed in the northwestern corner of the residential use just north of Almond Avenue.

- STNM5: represents the existing noise environment of the Packinghouse (church and associated uses) located along San Bernardino Avenue (27165 San Bernardino Avenue, Redlands). The noise meter was placed within the southeastern corner of the Packinghouse property near existing industrial uses.

- LTNM1: represents the existing noise environment of the multi-family residential uses to the southwest of the project site (27000 Lugonia Avenue, Redlands). The noise meter was placed near the southwestern corner of the project site just north of the multi-family residential uses.

Table 1 provides a summary of the short-term ambient noise data. Table 2 provides hourly interval ambient noise data from the long-term noise measurement. Short-term ambient noise levels were measured between

50.3 and 65 dBA L_{eq}. Long-term hourly noise measurement ambient noise levels ranged from 39.9 to 48.1 dBA L_{eq}. The dominant noise source was from vehicle traffic associated with Almond Avenue, Alabama Street, Lugonia Avenue, San Bernardino Avenue, Nevada Street, and other surrounding roadways.

Table 1
Short-Term Noise Measurement Summary (dBA)

Daytime Measurements[1,2]								
Site Location	Time Started	Leq	Lmax	Lmin	L(2)	L(8)	L(25)	L(50)
STNM1	1:46 PM	51.7	67.4	42.4	60.9	53.6	49.6	47.6
STNM2	2:20 PM	65.0	83.7	51.0	74.3	69.4	62.8	56.9
STNM3	2:54 PM	53.9	64.4	45.9	61.0	58.5	54.8	50.2
STNM4	3:50 PM	58.3	69.1	48.8	66.0	62.6	58.3	55.3
STNM5	4:26 PM	50.3	62.0	45.4	56.0	49.4	50.8	49.4

Notes:
(1) See Figure 5 for noise measurement locations. Each noise measurement was performed over a 15-minute duration.
(2) Noise measurements performed on June 6, 2022.

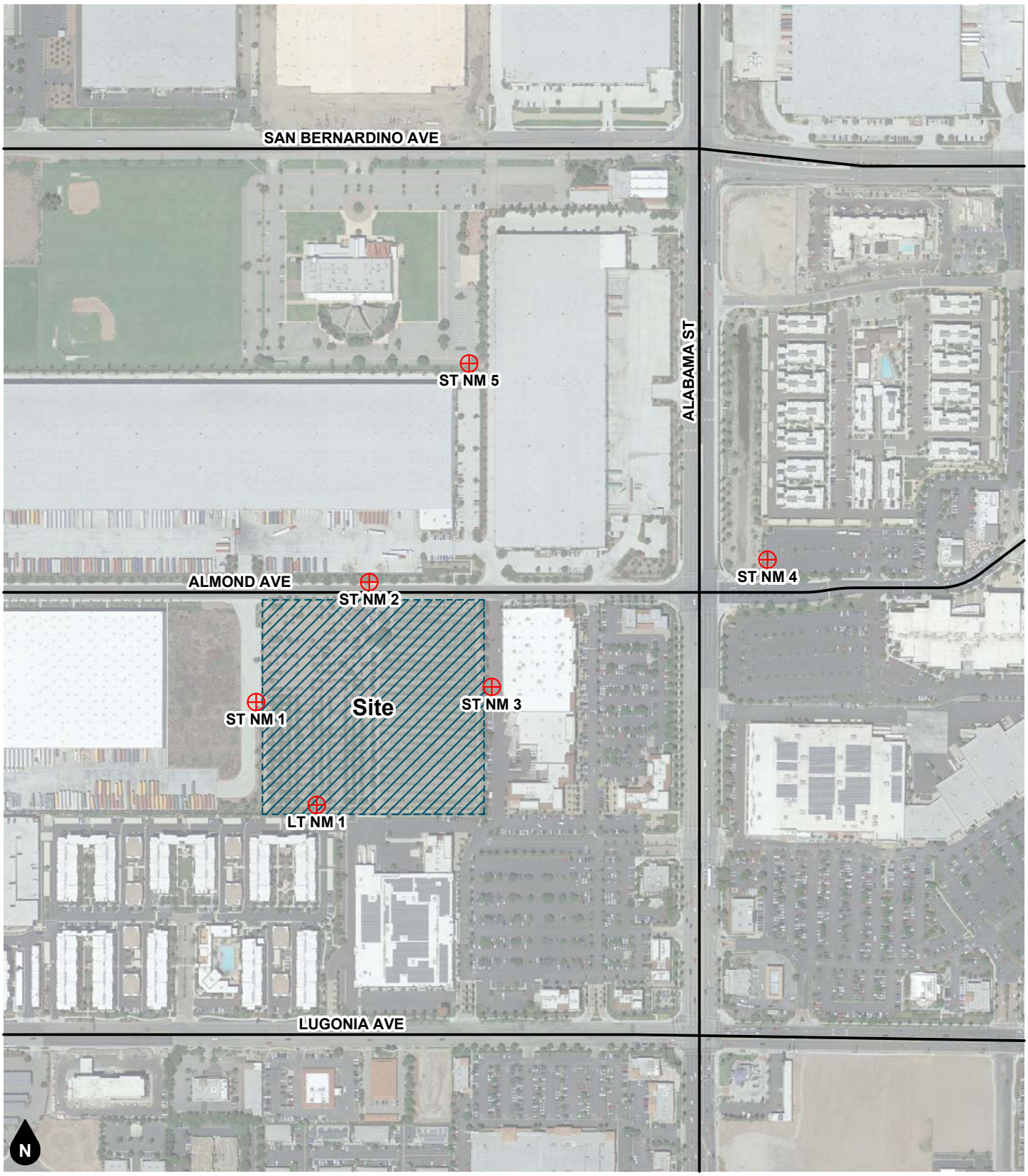
Table 2
Long-Term Noise Measurement Summary (dBA)

24-Hour Ambient Noise[1,2]								
Hourly Measurements	Time Started	Leq	Lmax	Lmin	L(2)	L(8)	L(25)	L(50)
Overall Summary	7:00 PM	44.5	75.7	33.2	51.4	46.6	43.7	41.7
1	7:00 PM	48.1	65.3	41.1	55.4	50.3	46.9	45.5
2	8:00 PM	45.5	60.4	38.9	53.1	47.9	44.6	42.9
3	9:00 PM	43.8	60.3	37.5	50.8	46.0	43.3	41.5
4	10:00 PM	43.3	59.6	37.4	50.1	45.8	42.5	40.9
5	11:00 PM	41.5	53.9	36.8	47.4	43.5	41.5	40.5
6	12:00 AM	42.5	58.2	35.7	49.4	43.7	41.6	40.6
7	1:00 AM	39.9	49.2	34.0	44.7	41.8	40.8	39.6
8	2:00 AM	45.3	68.7	33.2	46.5	42.7	42.1	41.2
9	3:00 AM	40.1	51.5	34.2	43.3	42.0	40.7	39.6
10	4:00 AM	42.1	53.7	36.7	46.2	44.3	42.4	41.5
11	5:00 AM	43.3	52.5	37.0	48.8	45.6	43.9	42.4
12	6:00 AM	43.4	55.0	36.4	50.6	47.0	43.3	41.5
13	7:00 AM	47.2	75.7	37.3	53.2	47.5	44.2	42.0
14	8:00 AM	45.4	66.0	37.4	52.5	47.8	44.8	42.5
15	9:00 AM	42.5	62.3	35.9	49.0	45.2	42.0	39.8
16	10:00 AM	45.7	64.1	36.3	53.8	48.8	44.0	41.3
17	11:00 AM	47.5	60.5	35.7	57.0	53.1	45.8	41.2
18	12:00 PM	41.4	57.0	35.9	47.7	44.3	41.2	39.5
19	1:00 PM	43.0	66.1	37.7	48.0	45.2	42.9	41.4
20	2:00 PM	43.4	62.1	37.0	49.9	46.6	43.3	41.3
21	3:00 PM	43.6	64.0	39.1	47.7	45.6	43.7	42.7
22	4:00 PM	44.4	56.9	39.9	49.4	46.1	44.4	43.4
23	5:00 PM	46.6	64.2	39.6	54.1	47.9	45.0	43.8
24	6:00 PM	46.3	65.0	39.6	53.0	48.4	45.1	43.5
CNEL	50.1							

Notes:

(1) See Figure 5 for noise measurement locations. Noise measurement was performed over a 24-hour duration.

(2) Noise measurement performed from June 6, 2022 to June 7, 2022.



Legend

NM 1 Noise Measurement Location

ST NM Short-Term Noise Measurement

LT NM Long-Term Noise Measurement

Figure 5
Noise Measurement Location Map

4. REGULATORY SETTING

FEDERAL REGULATION

Federal Noise Control Act of 1972

The U.S. Environmental Protection Agency (EPA) Office of Noise Abatement and Control was originally established to coordinate federal noise control activities. After its inception, EPA's Office of Noise Abatement and Control issued the Federal Noise Control Act of 1972, establishing programs and guidelines to identify and address the effects of noise on public health, welfare, and the environment. In response, the EPA published Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (Levels of Environmental Noise). The Levels of Environmental Noise recommended that the Ldn should not exceed 55 dBA outdoors or 45 dBA indoors to prevent significant activity interference and annoyance in noise-sensitive areas.

In addition, the Levels of Environmental Noise identified five (5) dBA as an "adequate margin of safety" for a noise level increase relative to a baseline noise exposure level of 55 dBA Ldn (i.e., there would not be a noticeable increase in adverse community reaction with an increase of five dBA or less from this baseline level). The EPA did not promote these findings as universal standards or regulatory goals with mandatory applicability to all communities, but rather as advisory exposure levels below which there would be no risk to a community from any health or welfare effect of noise.

In 1981, EPA administrators determined that subjective issues such as noise would be better addressed at lower levels of government. Consequently, in 1982 responsibilities for regulating noise control policies were transferred to State and local governments. However, noise control guidelines and regulations contained in EPA rulings in prior years remain in place by designated Federal agencies, allowing more individualized control for specific issues by designated Federal, State, and local government agencies.

STATE REGULATIONS

State of California General Plan Guidelines 2017

Though not adopted by law, the State of California General Plan Guidelines 2017, published by the California Governor's Office of Planning and Research (OPR) (OPR Guidelines), provides guidance for the compatibility of projects within areas of specific noise exposure. The OPR Guidelines identify the suitability of various types of construction relative to a range of outdoor noise levels and provide each local community some flexibility in setting local noise standards that allow for the variability in community preferences. Findings presented in the Levels of Environmental Noise Document (EPA 1974) influenced the recommendations of the OPR Guidelines, most importantly in the choice of noise exposure metrics (i.e., Ldn or CNEL) and in the upper limits for the normally acceptable outdoor exposure of noise-sensitive uses.

The OPR Guidelines include a Noise and Land Use Compatibility Matrix which identifies acceptable and unacceptable community noise exposure limits for various land use categories. Where the "normally acceptable" range is used, it is defined as the highest noise level that should be considered for the construction of the buildings which do not incorporate any special acoustical treatment or noise mitigation. The "conditionally acceptable" or "normally unacceptable" ranges include conditions calling for detailed acoustical study prior to the construction or operation of the proposed project. The County of San Bernardino has adopted their own version of the State Land Use Compatibility Guidelines (see Tables 3 and 4).

California Department of Transportation (Caltrans)

The California Department of Transportation has published one of the seminal works for the analysis of ground-borne noise and vibration relating to transportation- and construction-induced vibrations and although

the project is not subject to these regulations, it serves as useful tools to evaluate vibration impacts. These guidelines recommend that a standard of 0.2 inches per section (in/sec) PPV not be exceeded for the protection of normal residential buildings (California Department of Transportation, 2013). This is the appropriate threshold for construction related ground-borne vibration impacts.

LOCAL REGULATIONS

County of San Bernardino General Plan

The County of San Bernardino Countywide Plan (Policy Plan) serves as the County's General Plan and was adopted in October 2020. The County's Policy Plan's Hazards Element provides goals and policies that are intended to protect life, property, and commerce from impacts associated with natural hazards, human-generated hazards, and increased risk due to climate change. The noise related goals and policies from the Hazards Element that are applicable to the proposed project are presented below:

Goal HZ-2 Human-generated Hazards. People and the natural environment protected from exposure to hazardous materials, excessive noise, and other human-generated hazards.

Policies

Policy HZ-2.7 Truck delivery areas. We encourage truck delivery areas to be located away from residential properties and require associated noise impacts to be mitigated.

Policy HZ-2.8 Proximity to noise generating uses. We limit or restrict new noise sensitive land uses in proximity to existing conforming noise generating uses and planned industrial areas.

Policy HZ-2.9 Control sound at the source. We prioritize noise mitigation measures that control sound at the source before buffers, sound walls, and other perimeter measures.

County of San Bernardino Development Code

Section 83.01.080 of the County of San Bernardino Development Code establishes noise criteria not to be exceeded at the property line of adjacent land uses. These criteria would apply to on-site operational noise generated by the project. Nearby residential land uses may be affected by project-generated operational noise. Sections of the code applicable to the proposed project are presented below.

Noise Standards for Stationary Noise Sources

Table 3, Noise Standards for Stationary Noise Sources, describes the noise standard for emanations from a stationary noise source, as it affects adjacent properties. Stationary noise sources associated with the proposed project may impact nearby residential land uses. As shown in Table 3, the base exterior noise level standards for residential land uses are 55 dBA L_{eq} during daytime hours and 45 dBA during nighttime hours; and the base noise level criteria for park land uses is 65 dBA (anytime). As described in Table 3, other criteria apply depending on the duration of the noise event. For example, the maximum event noise level standard for impacts to the adjacent residential land uses is 75 dBA L_{eq} during daytime hours and 65 dBA during nighttime hours. Typically, if the 30-minute L_{eq} is not exceeded the other shorter criteria, with the exception of the L_{max} would be likely to be exceeded.

Noise Standards for Adjacent Mobile Noise Sources

The County of San Bernardino Development Code also sets forth interior and exterior noise level standards for transportation noise impacts to the proposed project (see Table 4). The noise level criteria of 45 dBA CNEL for interior noise and the 65 dBA CNEL apply to the nearby residential buildings.

Noise Standards for Construction Noise

Temporary construction, maintenance, repair, and demolition activities between 7:00 AM and 7:00 PM, except Sundays and Federal holidays are exempt from Section 83.01.080(g)(3) the San Bernardino Development Code.

This Development Code Standard seems to be contradictory to the General Plan Policy N1.6 above. Therefore, to be conservative, it is assumed that construction noise is exempt only between the hours presented above under Ordinance 83.01.080(g)(3).

Ground Vibration

Section 83.01.090(a) of the County of San Bernardino Development Code prohibits the creation of ground vibration that can be felt without the aid of instruments at or beyond the lot-line, nor shall any vibration be allowed which produces a particle velocity greater than or equal to two-tenths (0.2) inches per second measured at or beyond the lot-line. Per Section 83.01.090(c), construction and demolition related ground vibration is exempt from this requirement as long as it occurs between 7:00 AM and 7:00 PM Mondays through Saturdays and not on Sundays or Federal holidays. It is anticipated that project construction will occur within the exempt hours, therefore this threshold will not apply. The project does not proposed any non-construction related sources of ground-borne vibration.

Table 3
County of San Bernardino Noise Standards for Stationary Noise Sources

Affected Land Uses (Receiving Noise)	7:00 AM to 10:00 PM dBA L_{eq}	10:00 PM to 7:00 AM dBA L_{eq}
Residential	55	45
Professional Services	55	55
Other Commercial	60	60
Industrial	70	70

Noise limit categories. No person shall operate or cause to be operated a source of sound at a location or allow the creation of noise on property owned, leased, occupied, or otherwise controlled by the person, which causes the noise level, when measured on another property, either incorporated or unincorporated, to exceed any one of the following:

(A) The noise standard for the receiving land use as specified in Subsection B (Noise-impacted areas), above, for a cumulative period of more than 30 minutes in any hour.

(B) The noise standard plus 5 dB(A) for a cumulative period of more than 15 minutes in any hour.

(C) The noise standard plus 10 dB(A) for a cumulative period of more than five minutes in any hour.

(D) The noise standard plus 15 dB(A) for a cumulative period of more than one minute in any hour.

(E) The noise standard plus 20 dB(A) for any period of time.

If the measured ambient level exceeds any of the first four noise limit categories, the allowable noise exposure standard shall be increased to reflect the ambient noise level. If the ambient noise level exceeds the fifth noise limit category, the maximum allowable noise level under this category shall be increased to reflect the maximum ambient noise level.

Notes:

(1) Source: County of San Bernardino Development Code, Development Code Table 83-2.

Table 4
County of San Bernardino Noise Standards for Mobile Noise Sources

Land Use		L_{dn} (or CNEL) dB(A)	
Category	Type	Interior[1]	Exterior[2]
Residential	Single and multi-family, duplex, mobile homes	45	60[3]
Commercial	Hotel, motel, transient housing	45	60[3]
	Commercial retail, bank, restaurant	50	n/a
	Office building, research and development, professional offices	45	65
	Amphitheater, concert hall, auditorium, movie theater	45	n/a
Institutional/Public	Hospital, nursing home, school classroom, religious institution, library	45	65
Open Space	Park	n/a	65

Notes:

Source: County of San Bernardino Development Code, Development Code Table 83-3.

(1) The indoor environment shall exclude bathrooms, kitchens, toilets, closets and corridors.

(2) The outdoor environment shall be limited to:

Hospital/office building patios
Hotel and motel recreation areas
Mobile home parks
Multi-family private patios or balconies
Park picnic areas
Private yard of single-family dwellings
School playgrounds

(3) An exterior noise level of up to 65 dB(A) (or CNEL) shall be allowed provided exterior noise levels have been substantially mitigated through a reasonable application of the best available noise reduction technology, and interior noise exposure does not exceed 45 dB(A) (or CNEL) with windows and doors closed. Requiring that windows and doors remain closed to achieve an acceptable interior noise level shall necessitate the use of air conditioning or mechanical ventilation.

5. ANALYTICAL METHODOLOGY AND MODEL PARAMETERS

This section discusses the analysis methodologies used to assess noise impacts.

CONSTRUCTION NOISE MODELING

Construction noise associated with the proposed project was calculated at the sensitive receptor locations, utilizing methodology presented in the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (2018) together with several key construction parameters including: distance to each sensitive receiver, equipment usage, percent usage factor, and baseline parameters for the project site. Distances to receptors were based on the acoustical center of the project site. The equipment used to calculate the construction noise levels for each phase were based on the assumptions provided in the CalEEMod modeling in the Air Quality Analysis prepared for the proposed project (Lilburn Corporation, 2022). For construction noise purposes, the distance measured from the project site to sensitive receptors was assumed to be the acoustical center of the project site to the property line of residential properties with existing residential buildings. Sound emission levels associated with typical construction equipment as well as typical usage factors provided in Table 5 were utilized for modeling purposes. Construction noise worksheets are provided in Appendix D.

OFF-SITE OPERATIONAL NOISE MODELING (TRAFFIC)

The roadway noise level increases from project generated vehicular traffic were modeled utilizing a computer program that replicates the FHWA Traffic Noise Prediction Model FHWA-RD-77-108.

The FHWA Traffic Noise Prediction Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). In California the national REMELs are substituted with the California Vehicle Noise (Calveno) Emissions Levels.[1] Adjustments are then made to the REMEL to account for: total average daily traffic volumes, roadway classification (i.e., collector, secondary, major or arterial), the roadway active width (i.e., distance between the center of the outermost travel lanes on each side of the roadway), travel speed, truck mix (i.e., percentage of automobiles, medium trucks, and heavy trucks in the traffic volume), roadway grade and site conditions (hard or soft ground surface relating to the absorption of the ground, pavement, or landscaping). Research conducted by Caltrans identifies that the use of soft site conditions is appropriate for the application of the FHWA traffic noise prediction model.[2] Therefore, surfaces adjacent to all modeled roadways were assumed to have a "soft site". Possible reductions in noise levels due to intervening topography and buildings were not accounted for in this analysis.

Project average daily vehicle trips and vehicle mix were obtained from the trip generation provided in the 27195 Almond Avenue Warehouse Transportation Study Screening Assessment (Ganddini Group July 26, 2022) and project trip distribution was obtained from the 27195 Almond Avenue Warehouse Scope for Traffic Study (Ganddini Group July 26, 2022). Existing average daily vehicle traffic along Almond Avenue was estimated using existing ambient noise measurements (see Table 1, STNM2). Existing average daily vehicle traffic along Alabama Avenue was obtained from the San Bernardino Countywide Plan Transportation Existing Conditions Report, Table 3 - San Bernardino County Existing ADT Counts (March 2017).[3] Existing Plus Project vehicle mixes were calculated by adding the proposed project trips to existing conditions. FHWA spreadsheets are included in Appendix E.

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[1] California Department of Transportation Environmental Program, Office of Environmental Engineering. Use of California Vehicle Noise Reference Energy Mean Emission Levels (Calveno REMELs) in FHWA Highway Traffic Noise Prediction. September 1995. TAN 95-03.

[2] California Department of Transportation. Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report. June 1995. FHWA/CA/TL-95/23.

[3] Existing ADT for Alabama Street north of San Bernardino Avenue (only segment available for Alabama Avenue) obtained at https://countywideplan.com/wp-content/uploads/sites/68/2020/10/Trans_CWP_221_77_ExCon_FinalDraft_032917.pdf

ON-SITE OPERATIONAL NOISE MODELING (STATIONARY SOURCES)

The SoundPLAN acoustical modeling software was utilized to model project operational worst-case stationary noise impacts from the proposed project to adjacent sensitive uses (e.g., residences). SoundPLAN is capable of evaluating stationary noise sources (e.g., parking lots, drive-thru menus, carwash equipment, vacuums, etc.). The SoundPLAN software utilizes algorithms (based on the inverse square law) 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. In addition to the information provided below, noise modeling input and outputs assumptions are provided in Appendix F.

Modeled noise sources include parking lot noise, loading and unloading activities, truck movements, and HVAC equipment. With the exception of the truck movements (line source), all noise sources were modeled to be in full operation. This is a conservative modeling effort, given that in actuality, several of the noise sources are not in operation continuously for an entire hour.

Parking Lot Noise

Parking lot noise was calculated using SoundPLAN methodology. Specifically, the traffic volume of the parking lot is entered with the number of moves per parking, the hour and the number of parking bays. The user defines whether the parking lots are for automobiles, motorcycles, or trucks, and the emission level of a parking lot is automatically adjusted accordingly. The values for the number of parking moves for each time slice is the number of parking moves per reference unit (most often per parking bay), averaged for the hour[4].

SoundPLAN utilizes parking lot noise emission levels from the 6th revised edition of the parking lot study "Recommendations for the Calculation of Sound Emissions of Parking Areas, Motorcar Centers and Bus Stations as well as of Multi-Story Car Parks and Underground Car Parks" published by the Bavarian Landesamt für Umwelt provides calculation methods to determine the emissions of parking lots.

The parking lot emission table documents the reference level (Lw, ref) from the parking lot study.

Lw, ref = Lw0 + KPA + KI + KD + KStrO + 10 log(B) [dB(A)]

With the following parameters:

Lw0 = Basic sound power, sound power level of one motion / per hour on P+R areas = 63 dB(A)
KPA = Surcharge parking lot type
KI = Surcharge for impulse character
KD = Surcharge for the traffic passaging and searching for parking bays in the driving lanes 2,5 * lg (f * B - 9)
f = Parking bays per unit of the reference value
B = Reference value
KStrO = Surcharge for the road surface
B = Reference value

Loading/Unloading

The proposed loading area was modeled using a SoundPLAN sound reference level for loading/unloading of truck pallet loading with a sound power level representative of 70 dBA Leq.

Truck Movement

A line noise source was utilized to represent trucks entering and exiting the project site at a rate of 4 per hour with a noise reference level of 78.7 dBA.

[4] SoundPLAN Essential 4.0 Manual. SoundPLAN International, LLC. May 2016.

Mechanical Equipment (HVAC Units) Noise

A noise reference level of 67.7 dBA at 3 feet (sound power level of 78.7 dB) was utilized to represent rooftop 5 Ton Carrier HVAC units[5]. A rooftop HVAC plan is not available at the time of this analysis so the exact location and number of units per building were estimated. A roof plan is not yet available, so a conservative number of rooftop units (14) was modeled on the proposed rooftops. The noise source height for each HVAC unit was assumed at 1 meter above the roof top. Roof top is assumed to be approximately 14.2 meters (46 feet) above grade.

Maximum Noise Event (Lmax)

A maximum noise event associated with the maximum noise level for loading/unloading and release of air brakes (110 L_w)[6] was utilized to model maximum noise levels at nearby sensitive receptors. Horns, car alarms, trash trucks and trailers being hitched and unhitched would cause loud, but less loud noise events in the parking and truck loading/unloading areas.

[5] MD Acoustics, LLC Noise Measurement Data for RTU –Carrier 50TFQ0006 and car alarm.
[6] SoundPLAN Noise Model Library Version 8.2. February 10, 2020.

Table 5 (1 of 2)
CA/T Equipment Noise Emissions and Acoustical Usage Factor Database

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Spec. Lmax @ 50ft (dBA, slow)	Actual Measured Lmax @ 50ft (dBA, slow)	No. of Actual Data Samples (Count)
All Other Equipment > 5 HP	No	50	85	-N/A-	0
Auger Drill Rig	No	20	85	84	36
Backhoe	No	40	80	78	372
Bar Bender	No	20	80	-N/A-	0
Blasting	Yes	-N/A-	94	-N/A-	0
Boring Jack Power Unit	No	50	80	83	1
Chain Saw	No	20	85	84	46
Clam Shovel (dropping)	Yes	20	93	87	4
Compactor (ground)	No	20	80	83	57
Compressor (air)	No	40	80	78	18
Concrete Batch Plant	No	15	83	-N/A-	0
Concrete Mixer Truck	No	40	85	79	40
Concrete Pump Truck	No	20	82	81	30
Concrete Saw	No	20	90	90	55
Crane	No	16	85	81	405
Dozer	No	40	85	82	55
Drill Rig Truck	No	20	84	79	22
Drum Mixer	No	50	80	80	1
Dump Truck	No	40	84	76	31
Excavator	No	40	85	81	170
Flat Bed Truck	No	40	84	74	4
Forklift[2,3]	No	50	n/a	61	n/a
Front End Loader	No	40	80	79	96
Generator	No	50	82	81	19
Generator (<25KVA, VMS signs)	No	50	70	73	74
Gradall	No	40	85	83	70
Grader	No	40	85	-N/A-	0
Grapple (on backhoe)	No	40	85	87	1
Horizontal Boring Hydr. Jack	No	25	80	82	6
Hydra Break Ram	Yes	10	90	-N/A-	0
Impact Pile Driver	Yes	20	95	101	11
Jackhammer	Yes	20	85	89	133
Man Lift	No	20	85	75	23
Mounted Impact hammer (hoe ram)	Yes	20	90	90	212
Pavement Scarafier	No	20	85	90	2
Paver	No	50	85	77	9
Pickup Truck	No	50	85	77	9
Paving Equipment	No	50	85	77	9
Pneumatic Tools	No	50	85	85	90

Table 5 (2 of 2)
CA/T Equipment Noise Emissions and Acoustical Usage Factor Database

Equipment Description	Impact Device?	Acoustical Use Factor (%)	Spec. Lmax @ 50ft (dBA, slow)	Actual Measured Lmax @ 50ft (dBA, slow)	No. of Actual Data Samples (Count)
Pumps	No	50	77	81	17
Refrigerator Unit	No	100	82	73	3
Rivit Buster/chipping gun	Yes	20	85	79	19
Rock Drill	No	20	85	81	3
Roller	No	20	85	80	16
Sand Blasting (Single Nozzle)	No	20	85	96	9
Scraper	No	40	85	84	12
Shears (on backhoe)	No	40	85	96	5
Slurry Plant	No	100	78	78	1
Slurry Trenching Machine	No	50	82	80	75
Soil Mix Drill Rig	No	50	80	-N/A-	0
Tractor	No	40	84	-N/A-	0
Vacuum Excavator (Vac-truck)	No	40	85	85	149
Vacuum Street Sweeper	No	10	80	82	19
Ventilation Fan	No	100	85	79	13
Vibrating Hopper	No	50	85	87	1
Vibratory Concrete Mixer	No	20	80	80	1
Vibratory Pile Driver	No	20	95	101	44
Warning Horn	No	5	85	83	12
Welder/Torch	No	40	73	74	5

Notes:

(1) Source: FHWA Roadway Construction Noise Model User's Guide January 2006.

(2) Warehouse & Forklift Noise Exposure - NoiseTesting.info Carl Stautins, November 4, 2014 http://www.noisetesting.info/blog/carl-strautins/page-3/

(3) Data provided Leq as measured at the operator. Sound Level at 50 feet is calculated using Inverse Square Law.

6. IMPACT ANALYSIS

This impact discussion analyzes the potential for noise and/or groundborne vibration impacts to cause the exposure of a person to, or generation of, noise levels in excess of established County of San Bernardino standards related to construction, transportation, and operational noise related impacts from the proposed project.

NOISE IMPACTS DUE TO CONSTRUCTION ACTIVITIES

Construction activities will occur in phases including demolition, site preparation, grading, building construction, paving, and architectural coating. Assumptions for the phasing, duration, and required equipment for the construction of the proposed project were obtained from the project applicant. Construction activities are anticipated to begin no sooner than the end of May 2023 and be completed by the end of August 2024.

Construction noise will vary depending on the construction process, type of equipment involved, location of the construction site with respect to sensitive receptors, the schedule proposed to carry out each task (e.g., hours and days of the week) and the duration of the construction work. The existing multi-family residential uses located adjacent to the south and approximately 865 feet to the northeast and the church use located approximately 691 feet north of the project site boundaries may be affected by short-term noise impacts associated with construction noise.

Construction noise associated with the proposed project was calculated utilizing methodology presented in the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (2018) together with several key construction parameters including: distance to each sensitive receiver, equipment usage, percent usage factor, and baseline parameters for the project site. Distances to receptors were based on the acoustical center of the proposed construction activity. Construction noise levels were calculated for each phase. Anticipated noise levels during each construction phase are presented in Table 6. Worksheets for each phase are included as Appendix D.

Modeled unmitigated construction noise levels reach up to 71 dBA L_{eq} at the nearest multi-family residential property line to the south of the project site, 62 dBA L_{eq} at the nearest church property line to the north of the project site, and 60 dBA L_{eq} at the nearest multi-family residential property line to the northeast of the project site.

Table 6 also includes a comparison of existing noise levels and project construction noise levels. Long-term noise measurement (LTNM)1 was chosen to represent noise levels at the property line of the multi-family residential uses located south of the project site, short-term noise measurement (STNM)5 was chosen to represent noise levels at the property line of the church use located to the north of the project site, and STNM4 was chosen to represent noise levels at the property lien of the multi-family residential uses located to the northeast of the project site.

As discussed earlier, construction noise sources are regulated within Section 83.01.080(g)(3) of the County of San Bernardino's Development Code which prohibits construction activities other than between the hours of 7:00 AM and 7:00 PM, except Sundays and Federal holidays. Project construction will not occur outside of the hours outlined as "exempt" in County of San Bernardino Development Code Section 83.01.080(g)(3) and therefore, will not result in or generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance. Therefore, construction noise impacts will be less than significant, and no mitigation is required. The following BMPs are provided to reduce construction noise levels if requested by the County.

Construction Noise - Best Management Practices

1. Equip construction equipment, fixed or mobile, will be equipped with properly operating and maintained mufflers, consistent with manufacturer standards.

2. Place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the project site.

3. Shut off all equipment when not in use.

4. Locate construction staging areas that create the greatest distance between construction-related noise and vibration sources and sensitive receptors surrounding the project site, as is feasible.

5. Direct jackhammers, pneumatic equipment, and all other portable stationary noise sources away from nearby sensitive receptors. Either one-inch plywood or sound blankets can be utilized for this purpose. They should reach up from the ground and block the line of sight between equipment and the nearest off-site residences. The shielding should be without holes and cracks.

6. Prohibit the use of amplified music and/or voice on the project site.

7. Require that haul truck deliveries maintain the same hours as allowed for exempt construction activities per County of San Bernardino Development Code within Section 83.01.080(g)(3).

Off-Site Construction Activity

Construction truck trips would occur throughout the construction period. Given the project site's proximity to the 10 and 210 Freeways, it is anticipated that vendor and/or haul truck traffic would take the most direct route to the appropriate freeway ramps.

According to the Federal Highway Administration (FHWA), the traffic volumes need to be doubled in order to increase noise levels by 3 dBA CNEL.[7] The estimated existing average daily trips along Alabama Street are approximately 11,873 average daily vehicle trips and along Almond Avenue are approximately 6,480 average daily vehicle trips.[8] As shown in the CalEEMod output files provided in the Air Quality Analysis prepared for the proposed project (Lilburn 2022) the greatest number of construction related vehicle trips per day would be during building construction at up to approximately 122 vehicle trips per day (87.4 for worker trips and 34.1 for vendor trips). Therefore, the addition of project vendor/haul trucks and worker vehicles per day along off-site roadway segments would not be anticipated to result in a doubling of traffic volumes. Off-site project generated construction vehicle trips would result in a negligible noise level increase and would not result in a substantial increase in ambient noise levels. Impacts would be less than significant. No mitigation measures are required.

NOISE IMPACTS DUE TO PROJECT OPERATION

Noise Impacts to Off-Site Receptors Due to Project Generated Trips

During operation, the proposed project is expected to generate approximately 377 average daily trips with 31 trips during the AM peak-hour and 33 trips during the PM peak-hour. A project generated traffic noise level

[7] Federal Highway Administration, Highway Noise Prediction Model, December 1978.

[8] Existing average daily vehicle traffic along Almond Avenue was estimated using existing ambient noise measurements (see Table 1, STNM2). Existing average daily vehicle traffic along Alabama Avenue was obtained from San Bernardino Countywide Plan Transportation Existing Conditions Report, Table 3 - San Bernardino County Existing ADT Counts (March 2017), the segment of Alabama Street north of San Bernardino Avenue was utilized for existing average daily vehicle traffic as it is the only segment provided for Alabama Street.

was modeled utilizing the FHWA Traffic Noise Prediction Model - FHWA-RD-77-108. Traffic noise levels were calculated at the right of way from the centerline of the analyzed roadway. 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. Roadway input parameters including average daily traffic volumes (ADTs), speeds, and vehicle distribution data is shown in Table 7. The potential off-site noise impacts caused by an increase of traffic from operation of the proposed project on the nearby roadways were calculated for the following scenarios:

Existing Year (without Project): This scenario refers to existing year traffic noise conditions and is demonstrated in Table 7.

Existing Year (With Project): This scenario refers to existing year plus project traffic noise conditions and is demonstrated in Table 7.

As shown in Table 8, modeled Existing traffic noise levels range between 68-73 dBA CNEL at the right-of-way of each modeled roadway segment; and the modeled Existing Plus Project traffic noise levels range between 69-73 dBA CNEL at the right-of-way of each modeled roadway segment.

For purposes of this project, increases in ambient noise along affected roadways due to project generated vehicle traffic is considered substantial if they result in an increase of at least 5 dBA CNEL and: (1) the existing noise levels already exceed the applicable mobile source noise standard for the affected sensitive receptors set forth in the County's Development Code; or (2) the project increases noise levels by at least 5 dBA CNEL and raises the ambient noise level from below the applicable standard to above the applicable standard.

Project generated vehicle traffic is anticipated to change the noise a between approximately 0.04 to 0.79 dBA CNEL. Therefore, a change in noise level would not be audible and would be considered less than significant. No mitigation is required.

Noise impacts to Off-Site Receptors Due to On-Site Operational Noise

Operational Noise Levels -Leq

The SoundPLAN noise model was utilized to estimate peak hour operation of the project in order to determine if it is likely to result in substantial increases in ambient noise levels. A description of each noise source and model parameters are discussed in Section 5 of this report. As shown in Figure 6, with a nine (9) foot concrete wall surrounding the loading and unloading area, operational noise levels would range between 26 and 45 dBA Leq at nearby receptors and are not likely to exceed residential daytime or nighttime noise standards (55 and 45 dBA Leq, respectively) at the residential land uses located south of the project site; nor will they exceed the exterior noise standard for adjacent industrial land uses (70 dBA Leq for both day and nighttime). This impact would be less than significant. No mitigation measures are required.

Operational Noise Levels - Lmax

A point noise source representative of larger truck venting air brakes (110 L_w) was utilized to model a maximum noise event near the residential properties south of the project site. As shown on Figure 7, with the proposed 9-foot concrete wall, operational noise levels may reach up to 70 dBA L_{max} at the residential property line and would not exceed the daytime maximum noise standard of 75 dBA L_{max}; but could exceed the nighttime Lmax standard of 65 at the property line. Considering that there are no outdoor recreational areas affected by project noise, it is reasonable to apply the maximum nighttime noise criteria at the actual residential buildings. As shown in Figure 9, exterior nighttime maximum noise levels at the existing residential buildings would reach up to 64 dB Lmax and would not exceed the nighttime maximum noise standard of 65. Typical residential construction provides 20 dB of exterior to interior reduction with windows closed so interior noise levels are not expected to exceed 45 dB. If it is not acceptable to the County to adjust the receptor from the property

line to the residential buildings, then it is recommended that signs be installed prohibiting the use of air compression brakes on-site. Either scenario would result in acceptable nighttime average and maximum noise levels. A higher barrier is not recommended because at 14-feet in height, the maximum noise event could still exceed 65 dBA Leq at the property line. This impact would be less than significant with mitigation depending on whether the City finds the analysis at the actual buildings acceptable. Otherwise, signs prohibiting the use of compression brakes on-site would need to be installed to reduce impacts to less than significant.

GROUNDBORNE VIBRATION IMPACTS

There are several types of construction equipment that can cause vibration levels high enough to annoy persons in the vicinity and/or result in architectural or structural damage to nearby structures and improvements. For example, as shown in Table 9, a vibratory roller could generate up to 0.21 PPV at a distance of 25 feet; and operation of a large bulldozer (0.089 PPV) at a distance of 25 feet (two of the most vibratory pieces of construction equipment). Groundborne vibration at sensitive receptors associated with this equipment would drop off as the equipment moves away. For example, as the vibratory roller moves further than 100 feet from the sensitive receptors, the vibration associated with it would drop below 0.0026 PPV. It should be noted that these vibration levels are reference levels and may vary slightly depending upon soil type and specific usage of each piece of equipment.

Architectural Damage

Construction activity has the potential to result in cracking of floor slabs, foundations, columns, beams, or wells, or cosmetic architectural damage, such as cracked plaster, stucco, or tile. (California Department of Transportation, 2020). Land uses adjacent to the proposed construction are industrial and residential. Table 10 identifies a PPV level of 0.5 in/sec as the threshold at which there is a risk to "architectural" damage to modern industrial/commercial buildings and a PPV level of 0.3 in/sec for older residential structures. Furthermore, Section 83.01.090(a) of the County of San Bernardino Development Code prohibits the creation of ground vibration that can be felt without the aid of instruments at or beyond the lot-line, nor shall any vibration be allowed which produces a particle velocity greater than or equal to two-tenths (0.2) inches per second measured at or beyond the lot-line. Per Section 83.01.090(c), construction and demolition related ground vibration is exempt from this requirement as long as it occurs between 7:00 AM and 7:00 PM Mondays through Saturdays and not on Sundays or Federal holidays.

The nearest off-site structures include the multi-family residential buildings located to the south, with structures located as close as approximately 55 feet to the south of the project's southern property line; the commercial structures located to the south and east, with structures located as close as approximately 58 feet to the south of the project's southern property line and 62 feet to the east of the project's eastern property line; and the industrial structures to the west, north, and northeast, with structures located as close as approximately 291 feet to the west of the project's western property line, 198 feet to the north of the project's northern property line, and 162 feet northeast of the project's northern property line. Therefore, the nearest off-site structure is the multi-family residential structures located approximately 55 feet to the south of the southern project property line. At 55 feet, use of a vibratory roller would be expected to generate a PPV of 0.064 in/sec and a bulldozer would be expected to generate a PPV of 0.027 in/sec. Temporary vibration levels associated with project construction would not exceed the threshold at which there is a risk to "architectural" damage to older residential structures PPV of 0.3 in/sec PPV nor the County's threshold of 0.2 in/sec PPV. In addition, it is anticipated that project construction will occur within the exempt hours as identified in Section 83.01.090(c) of the County's Development Code. The project does not propose any non-construction related sources of ground-borne vibration. Impacts would be less than significant. No mitigation is required.

Temporary vibration levels associated with project construction would be less than significant. No mitigation is required. Vibration worksheets are provided in Appendix G.

Annoyance to Persons

The primary effect of perceptible vibration is often a concern. However, secondary effects, such as the rattling of a china cabinet, can also occur, even when vibration levels are well below perception. Any effect (primary perceptible vibration, secondary effects, or a combination of the two) can lead to annoyance. The degree to which a person is annoyed depends on the activity in which they are participating at the time of the disturbance. For example, someone sleeping, or reading will be more sensitive than someone who is running on a treadmill. Reoccurring primary and secondary vibration effects often lead people to believe that the vibration is damaging their home, although vibration levels are well below minimum thresholds for damage potential. (California Department of Transportation, 2020).

As stated previously, the nearest off-site structure is the multi-family residential structures located approximately 55 feet to the south of the southern project property line. At 55 feet, use of a vibratory roller would be expected to generate a PPV of 0.064 in/sec and a bulldozer would be expected to generate a PPV of 0.027 in/sec. As shown in Table 11, groundborne vibration becomes distinctly perceptible to sensitive receptors at a level of 0.04 in/sec PPV and severely perceptible at a level of 0.1 in/sec PPV. Construction vibration may be noticeable for short periods of time but will not be "severely perceptible" at the nearest sensitive receptors (multiple family buildings located south of the project site). Annoyance will be short-term and will occur only during site grading and preparation which will be limited to daytime hours. Impacts will be less than significant. No mitigation is required. Vibration worksheets are provided in Appendix G.

Table 6
Construction Noise Levels (dBA L_{eq})

Phase	Receptor Location	Existing Ambient Noise Levels (dBA Leq)[2]	Construction Noise Levels (dBA Leq)
Demolition	Multi-Family Residential Uses to South (Circa 2020 Redlands Apartments, 27000 W Lugonia Ave, Redlands)	44.5	65.4
	Church Use to Northeast (Packinghouse Christian Church, 27165 San Bernardino Ave, Redlands)	50.3	63.4
	Multi-Family Residential Uses to Northeast (The Summit Apartments, 27431 San Bernardino Avenue, Redlands)	58.3	59.1
Site Preparation	Multi-Family Residential Uses to South (Circa 2020 Redlands Apartments, 27000 W Lugonia Ave, Redlands)	44.5	71.1
	Church Use to Northeast (Packinghouse Christian Church, 27165 San Bernardino Ave, Redlands)	50.3	61.7
	Multi-Family Residential Uses to Northeast (The Summit Apartments, 27431 San Bernardino Avenue, Redlands)	58.3	59.5
Grading	Multi-Family Residential Uses to South (Circa 2020 Redlands Apartments, 27000 W Lugonia Ave, Redlands)	44.5	70.7
	Church Use to Northeast (Packinghouse Christian Church, 27165 San Bernardino Ave, Redlands)	50.3	61.3
	Multi-Family Residential Uses to Northeast (The Summit Apartments, 27431 San Bernardino Avenue, Redlands)	58.3	59.2
Building Construction	Multi-Family Residential Uses to South (Circa 2020 Redlands Apartments, 27000 W Lugonia Ave, Redlands)	44.5	69.4
	Church Use to Northeast (Packinghouse Christian Church, 27165 San Bernardino Ave, Redlands)	50.3	59.9
	Multi-Family Residential Uses to Northeast (The Summit Apartments, 27431 San Bernardino Avenue, Redlands)	58.3	57.8
Paving	Multi-Family Residential Uses to South (Circa 2020 Redlands Apartments, 27000 W Lugonia Ave, Redlands)	44.5	64.9
	Church Use to Northeast (Packinghouse Christian Church, 27165 San Bernardino Ave, Redlands)	50.3	55.4
	Multi-Family Residential Uses to Northeast (The Summit Apartments, 27431 San Bernardino Avenue, Redlands)	58.3	53.3
Architectural Coating	Multi-Family Residential Uses to South (Circa 2020 Redlands Apartments, 27000 W Lugonia Ave, Redlands)	44.5	57.4
	Church Use to Northeast (Packinghouse Christian Church, 27165 San Bernardino Ave, Redlands)	50.3	48.0
	Multi-Family Residential Uses to Northeast (The Summit Apartments, 27431 San Bernardino Avenue, Redlands)	58.3	45.8

Notes:

(1) Construction noise worksheets are provided in Appendix D.

(2) Per measured existing ambient noise levels (see Table 1). LTNM1 was used for residential uses to the south, STNM5 was used for church uses to the north, and STNM4 was used for residential uses to the northeast.

Table 7
Project Average Daily Traffic Volumes and Roadway Parameters

Roadway	Segment	Average Daily Traffic Volume[1]		Posted Travel Speeds (MPH)	Site Conditions
		Existing	Existing Plus Project		
Alabama Street	North of Almond Avenue	11,873	11,986	45	Soft
	South of Almond Avenue	11,873	12,118	45	Soft
Almond Avenue	West of Project Site	6,480	6,499	40	Soft
	Project Site to Alabama Avenue	6480	6838	40	Soft

Vehicle Distribution (Light Mix)[2]			
Motor-Vehicle Type	Daytime % (7 AM-7 PM)	Evening % (7 PM-10 PM)	Night % (10 PM-7 AM)
Automobiles	75.56	13.96	10.49
Medium Trucks	48.91	2.17	48.91
Heavy Trucks	47.30	5.41	47.30

Vehicle Distribution (Heavy Mix)[2]			
Motor-Vehicle Type	Daytime % (7 AM-7 PM)	Evening % (7 PM-10 PM)	Night % (10 PM-7 AM)
Automobiles	75.54	14.02	10.43
Medium Trucks	48.00	2.00	50.00
Heavy Trucks	48.00	2.00	50.00

Notes:

(1) Project average daily vehicle trips and vehicle mix were obtained from the trip generation provided in the 27195 Almond Avenue Warehouse Transportation Study Screening Assessment (Ganddini Group July 26, 2022) and project trip distribution was obtained from the 27195 Almond Avenue Warehouse Scope for Traffic Study (Ganddini Group July 26, 2022). Existing average daily vehicle traffic along Almond Avenue was estimated using existing ambient noise measurements (see Table 1, STNM2). Existing average daily vehicle traffic along Alabama Avenue was obtained from San Bernardino Countywide Plan Transportation Existing Conditions Report, Table 3 - San Bernardino County Existing ADT Counts (March 2017), the segment of Alabama Street north of San Bernardino Avenue was utilized for existing average daily vehicle traffic as it is the only segment provided for Alabama Street.

(2) Existing vehicle percentages are based on the Riverside County Industrial Hygiene Letter for Traffic Noise.

Table 8
Increase in Existing Noise Levels Along Roadways as a Result of Project (dBA CNEL)

Roadway	Segment	Distance from roadway centerline to right-of-way (feet)[2]	Modeled Noise Levels (dBA CNEL)[1]				
			Existing Without Project at right-of-way	Existing Plus Project at right-of-way	Change in Noise Level	Exceeds Standards[3]	Increase of 5 dB or More?
Alabama Street	North of Almond Avenue	60	72.86	72.92	0.06	Yes	No
	South of Almond Avenue	60	72.86	72.99	0.13	Yes	No
Almond Avenue	West of Project Site	30	68.44	68.48	0.04	Yes	No
	Project Site to Alabama Avenue	30	68.44	69.23	0.79	Yes	No

Notes:

(1) Exterior noise levels calculated 5 feet above pad elevation, perpendicular to subject roadway.

(2) Right of way for Alabama Street per the County of San Bernardino Policy Plan, Transportation & Mobility Element Table TM-1 (2020) and right-of-way for Almond Avenue estimated by use of Google Earth imagery.

(3) Per the County of San Bernardino residential exterior noise standards for mobile noise sources of 60 dBA CNEL (see Table 4).

Table 9
Construction Equipment Vibration Source Levels

Equipment		PPV at 25 ft, in/sec	Approximate Lv* at 25 ft
Pile Driver (impact)	upper range	1.518	112
	typical	0.644	104
Pile Driver (sonic)	upper range	0.734	105
	typical	0.170	93
clam shovel drop (slurry wall)		0.202	94
Hydromill (slurry wall)	in soil	0.008	66
	in rock	0.017	75
Vibratory Roller		0.210	94
Hoe Ram		0.089	87
Large Bulldozer		0.089	87
Caisson Drilling		0.089	87
Loaded Trucks		0.076	86
Jackhammer		0.035	79
Small Bulldozer		0.003	58

Source: Federal Transit Administration: Transit Noise and Vibration Impact Assessment Manual, 2018.
*RMS velocity in decibels, VdB re 1 micro-in/sec

Table 10
Guideline Vibration Damage Potential Threshold Criteria

Structure 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: California Department of Transportation. Transportation and Construction Vibration Guidance Manual, Chapter 7 Table 19, April 2020.

Notes:

(1) 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 11
Guideline Vibration Annoyance Potential Criteria

Human Response	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.10
Severe	2.0	0.4

Source: California Department of Transportation. Transportation and Construction Vibration Guidance Manual, Chapter 7 Table 20, April 2020.

Notes:

(1) 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.

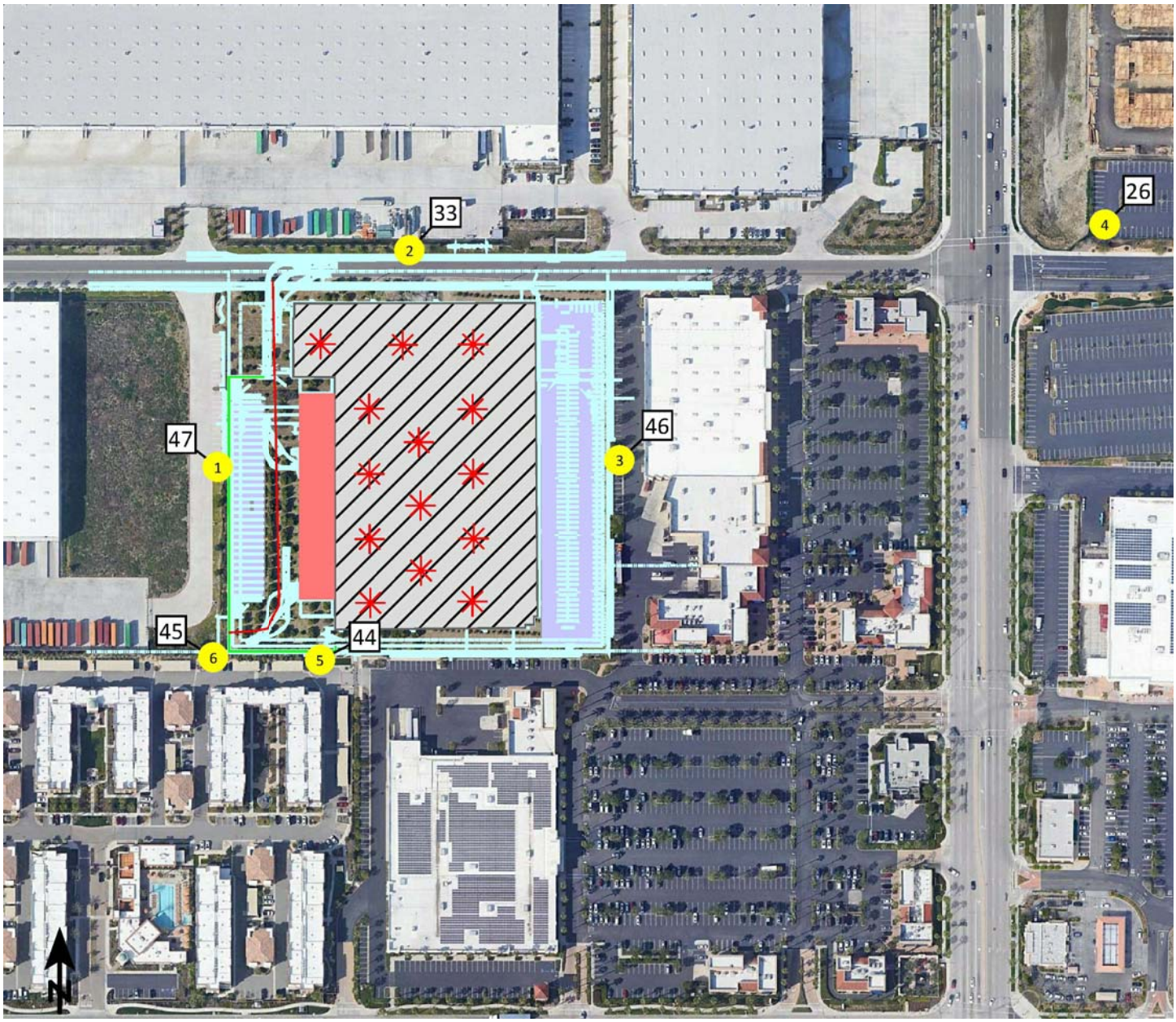

Figure 6
Project Operational Noise Levels (dBA, Leq)

Figure 7
Project Operational Noise Levels (dBA, Leq) Wall Hight - 9-Feet

7. CEQA THRESHOLDS & IMPACTS EVALUATION

Will the project result in the:

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

Less Than Significant Impact:

On-Site Construction Noise

Construction activities will occur in phases including demolition, site preparation, grading, building construction, paving, and architectural coating. Assumptions for the phasing, duration, and required equipment for the construction of the proposed project were obtained from the project applicant. Construction activities are anticipated to begin no sooner than the end of May 2023 and be completed by the end of August 2024.

Construction noise will vary depending on the construction process, type of equipment involved, location of the construction site with respect to sensitive receptors, the schedule proposed to carry out each task (e.g., hours and days of the week) and the duration of the construction work. The existing multi-family residential uses located adjacent to the south and approximately 865 feet to the northeast and the church use located approximately 691 feet north of the project site boundaries may be affected by short-term noise impacts associated with construction noise.

Construction noise associated with each phase of project construction associated with the proposed project was calculated utilizing methodology presented in the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (2018) together with several key construction parameters including: distance to each sensitive receiver, equipment usage, percent usage factor, and baseline parameters for the project site.

Modeled unmitigated construction noise levels reach up to 71 dBA L_{eq} at the nearest multi-family residential property line to the south of the project site, 62 dBA L_{eq} at the nearest church property line to the north of the project site, and 60 dBA L_{eq} at the nearest multi-family residential property line to the northeast of the project site.

As discussed earlier, construction noise sources are regulated within Section 83.01.080(g)(3) of the County of San Bernardino's Development Code which prohibits construction activities other than between the hours of 7:00 AM and 7:00 PM, except Sundays and Federal holidays.

Project construction will not occur outside of the hours outlined as "exempt" in County of San Bernardino Development Code Section 83.01.080(g)(30 and therefore, will not result in or generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance. Construction noise impacts would be less than significant no mitigation is required. The following BMPs are provided to further reduce construction noise if requested by the County.

Construction Noise - Best Management Practices

1. All construction equipment, fixed or mobile, will be equipped with properly operating and maintained mufflers, consistent with manufacturer standards.

2. All stationary construction equipment will be placed so that emitted noise is directed away from the noise sensitive receptors nearest the project site.

3. As applicable, shut off all equipment when not in use.

4. To the degree possible, equipment staging will be located in areas that create the greatest distance between construction-related noise and vibration sources and sensitive receptors surrounding the project site.

5. Jackhammers, pneumatic equipment, and all other portable stationary noise sources will be directed away from existing residences east of the project site. Either one-inch plywood or sound blankets can be utilized for this purpose. They should reach up from the ground and block the line of sight between equipment and the nearest off-site residences. The shielding should be without holes and cracks.

6. No amplified music and/or voice will be allowed on the project site.

7. Haul truck deliveries will not occur outside of the hours presented as exempt for construction per County of San Bernardino Development Code within Section 83.01.080(g)(3).

Off-Site Construction Noise

Construction truck trips would occur throughout the construction period. Given the project site's proximity to the 10 and 210 Freeways, it is anticipated that vendor and/or haul truck traffic would take the most direct route to the appropriate freeway ramps.

According to the Federal Highway Administration (FHWA), the traffic volumes need to be doubled in order to increase noise levels by 3 dBA CNEL.[9] The estimated existing average daily trips along Alabama Street are approximately 11,873 average daily vehicle trips and along Almond Avenue are approximately 6,480 average daily vehicle trips.[10] As shown in the CalEEMod output files provided in the Air Quality Analysis prepared for the proposed project (Lilburn 2022) the greatest number of construction related vehicle trips per day would be during building construction at up to approximately 122 vehicle trips per day (87.4 for worker trips and 34.1 for vendor trips). Therefore, the addition of project vendor/haul trucks and worker vehicles per day along off-site roadway segments would not be anticipated to result in a doubling of traffic volumes. Off-site project generated construction vehicle trips would result in a negligible noise level increase and would not result in a substantial increase in ambient noise levels. Impacts would be less than significant. No mitigation measures are required.

On-Site Operational Noise

Operational Noise Levels -Leq

The SoundPLAN noise model was utilized to estimate peak hour operation of the project in order to determine if it is likely to result in substantial increases in ambient noise levels. A description of each noise source and model parameters are discussed in Section 5 of this report. As shown in Figure 6, with a nine (9) foot concrete wall surrounding the loading and unloading area, operational noise levels would range between 26 and 45 dBA Leq at nearby receptors and are not likely to exceed residential daytime or nighttime noise standards (55 and 45 dBA Leq, respectively) at the residential land uses located south of the project site; nor will they exceed the exterior noise standard for adjacent industrial land uses (70 dBA Leq for both day and nighttime). This impact would be less than significant. No mitigation measures are required.

[9] Federal Highway Administration, Highway Noise Prediction Model, December 1978.

[10] Existing average daily vehicle traffic along Almond Avenue was estimated using existing ambient noise measurements (see Table 1, STNM2). Existing average daily vehicle traffic along Alabama Avenue was obtained from San Bernardino Countywide Plan Transportation Existing Conditions Report, Table 3 - San Bernardino County Existing ADT Counts (March 2017), the segment of Alabama Street north of San Bernardino Avenue was utilized for existing average daily vehicle traffic as it is the only segment provided for Alabama Street.

Operational Noise Levels - Lmax

A point noise source representative of larger truck venting air brakes (110 L_w) was utilized to model a maximum noise event near the residential properties south of the project site. As shown on Figure 7, with the proposed 9-foot concrete wall, operational noise levels may reach up to 70 dBA L_{max} at the residential property line and would not exceed the daytime maximum noise standard of 75 dBA L_{max}; but could exceed the nighttime Lmax standard of 65 at the property line. Considering that there are no outdoor recreational areas affected by project noise, it is reasonable to apply the maximum nighttime noise criteria at the actual residential buildings. As shown in Figure 9, exterior nighttime maximum noise levels at the existing residential buildings would reach up to 64 dB Lmax and would not exceed the nighttime maximum noise standard of 65. Typical residential construction provides 20 dB of exterior to interior reduction with windows closed so interior noise levels are not expected to exceed 45 dB. If it is not acceptable to the County to adjust the receptor from the property line to the residential buildings, then it is recommended that signs be installed prohibiting the use of air compression brakes on-site. Either scenario would result in acceptable nighttime average and maximum noise levels. A higher barrier is not recommended because at 14-feet in height, the maximum noise event could still exceed 65 dBA Leq at the property line. This impact would be less than significant with mitigation depending on whether the City finds the analysis at the actual buildings acceptable. Otherwise, signs prohibiting the use of compression brakes on-site would need to be installed to reduce impacts to less than significant.

During operation, the proposed project is expected to generate approximately 377 average daily trips with 31 trips during the AM peak-hour and 33 trips during the PM peak-hour. A Project generated vehicle noise along affected roadways was modeled utilizing a computer program that replicates the FHWA Traffic Noise Prediction Model FHWA-RD-77-108. Project generated vehicle trips are anticipated to increase noise levels between approximately 0.04 to 0.79 dBA CNEL and would not result in significant increases in ambient noise levels. The impact would be less than significant. No mitigation is required.

b) Generation of excessive groundborne vibration of groundborne noise levels?

Less Than Significant Impact:

The Caltrans Transportation and Construction Vibration Guidance Manual (2020) provides a comprehensive discussion regarding groundborne vibration and the appropriate thresholds to use to assess the potential for damage. As shown in Table 10, the threshold at which there is a risk of "architectural" damage to historic structures is a peak particle velocity (PPV) of 0.25 in/sec, and a PPV of 0.3 in/sec at older residential structures. There is a risk of architectural damage at newer residential structures and modern commercial/industrial buildings at a PPV of 0.5 in/sec. In addition, the Caltrans Noise and Vibration Manual identifies 0.1 PPV in./sec. as the level that is "strongly perceptible" (Table 11). Furthermore, Section 83.01.090(a) of the County of San Bernardino Development Code prohibits the creation of ground vibration that can be felt without the aid of instruments at or beyond the lot-line, nor shall any vibration be allowed which produces a particle velocity greater than or equal to two-tenths (0.2) inches per second measured at or beyond the lot-line. Per Section 83.01.090(c), construction and demolition related ground vibration is exempt from this requirement as long as it occurs between 7:00 AM and 7:00 PM Mondays through Saturdays and not on Sundays or Federal holidays.

The nearest off-site structures include the multi-family residential buildings located to the south, with structures located as close as approximately 55 feet to the south of the project's southern property line; the commercial structures located to the south and east, with structures located as close as approximately 58 feet to the south of the project's southern property line and 62 feet to the east of the project's eastern property line; and the industrial structures to the west, north, and northeast, with structures located as close as approximately 291 feet to the west of the project's western property line, 198 feet to the north of the project's northern property line, and 162 feet northeast of the project's northern property line. Therefore, the nearest off-site structure is the multi-family residential structures located approximately 55 feet to the south of the southern project property line. At 55 feet, use of a vibratory roller would be expected to generate a PPV of 0.064 in/sec and a bulldozer would be expected to generate a PPV of 0.027 in/sec. Temporary vibration levels

associated with project construction would not exceed the threshold at which there is a risk to "architectural" damage to older residential structures PPV of 0.3 in/sec PPV nor the County's threshold of 0.2 in/sec PPV. In addition, it is anticipated that project construction will occur within the exempt hours as identified in Section 83.01.090(c) of the County's Development Code. The project does not propose any non-construction related sources of ground-borne vibration. Impacts would be less than significant. No mitigation is required.

As shown in Table 11, groundborne vibration becomes distinctly perceptible to sensitive receptors at a level of 0.04 in/sec PPV and severely perceptible at a level of 0.1 in/sec PPV.

As stated previously, the nearest off-site structure is the multi-family residential structures located approximately 55 feet to the south of the southern project property line. At 55 feet, use of a vibratory roller would be expected to generate a PPV of 0.064 in/sec and a bulldozer would be expected to generate a PPV of 0.027 in/sec. As shown in Table 11, groundborne vibration becomes distinctly perceptible to sensitive receptors at a level of 0.04 in/sec PPV and severely perceptible at a level of 0.1 in/sec PPV. Construction vibration may be noticeable for short periods of time but will not be "severely perceptible" at the nearest sensitive receptors (multiple family buildings located south of the project site). Annoyance will be short-term and will occur only during site grading and preparation which will be limited to daytime hours. Impacts will be less than significant. No mitigation is required. Vibration worksheets are provided in Appendix G.

Operation of the proposed project will involve the movement of passenger vehicles and trucks. Driving surfaces associated with the project will be paved and will generally be smooth. Loaded trucks generally have a PPV of 0.076 at a distance of 25 feet (Caltrans 2020). Groundborne vibration levels associated with passenger vehicles is much lower. The movement of vehicles on the project site would not result in the generation of excessive groundborne vibration or groundborne noise. Impacts would be less than significant. No mitigation is required.

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

No Impact:

The closest airports to the project site are the San Bernardino International Airport, with associated airport runways located as close as approximately 1.79 miles to the northwest, and the Redlands Municipal Airport, with associated airport runaways located as close as approximately 3.33 miles to the northeast of the project site.

The San Bernardino International Airport noise contours provided in the Technical Memorandum prepared for the San Bernardino International Airport – Eastgate Air Cargo Facility – Aircraft Noise Contour Development (July 2019) shows that the proposed project is within the 60 dBA CNEL noise contour for the San Bernardino International Airport.[11] Furthermore, as shown on the Redlands Municipal Airport Land Use Compatibility Plan (ALUCP) Figure 3B, the project site is well outside of the 60 dBA CNEL noise contour for the Redlands Municipal Airport.[12]

Therefore, the proposed project would not expose people residing or working in the area to excessive noise levels. There is no impact, and no mitigation is required.

[11] http://www.sbiaa.org/wp-content/uploads/2019/07/7_Appendix-F_Noise-Technical-Memo.pdf

[12] Redlands Municipal Airport Land Use Compatibility Plan, revised May 6, 2003.

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APPENDICES

Appendix A List of Acronyms
Appendix B Definitions of Acoustical Terms
Appendix C Noise Measurement Field Worksheet
Appendix D Construction Noise Modeling
Appendix E Project Generated Trips FHWA Worksheets
Appendix F SoundPLAN Inputs and Outputs
Appendix G Vibration Worksheets

APPENDIX A

LIST OF ACRONYMS

Term	Definition
ADT	Average Daily Traffic
ANSI	American National Standard Institute
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
D/E/N	Day / Evening / Night
dB	Decibel
dBA or dB(A)	Decibel "A-Weighted"
dBA/DD	Decibel per Double Distance
dBA L_{eq}	Average Noise Level over a Period of Time
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
L_{02},L_{08},L_{50},L_{90}	A-weighted Noise Levels at 2 percent, 8 percent, 50 percent, and 90 percent, respectively, of the time period
DNL	Day-Night Average Noise Level
$L_{eq(x)}$	Equivalent Noise Level for '"x" period of time
L_{eq}	Equivalent Noise Level
L_{max}	Maximum Level of Noise (measured using a sound level meter)
L_{min}	Minimum Level of Noise (measured using a sound level meter)
Lp	Sound Pressure Level
LOS C	Level of Service C
Lw	Sound Power Level
OPR	California Governor's Office of Planning and Research
PPV	Peak Particle Velocities
RCNM	Road Construction Noise Model
REMEL	Reference Energy Mean Emission Level
RMS	Root Mean Square

APPENDIX B

DEFINITIONS OF ACOUSTICAL TERMS

Term	Definition
Ambient Noise Level	The all-encompassing noise environment associated with a given environment, at a specified time, usually a composite of sound from many sources, at many directions, near and far, in which usually no particular sound is dominant.
A-Weighted Sound Level, dBA	The sound level obtained by use of A-weighting. 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.
CNEL	Community Noise Equivalent Level. CNEL is a weighted 24-hour noise level that is obtained by adding five decibels to sound levels in the evening (7:00 PM to 10:00 PM), and by adding ten decibels to sound levels at night (10:00 PM to 7:00 AM). This weighting accounts for the increased human sensitivity to noise during the evening and nighttime hours.
Decibel, dB	A logarithmic unit of noise level measurement that relates the energy of a noise source to that of a constant reference level; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
DNL, Ldn	Day Night Level. The DNL, or Ldn is a weighted 24-hour noise level that is obtained by adding ten decibels to sound levels at night (10:00 PM to 7:00 AM). This weighting accounts for the increased human sensitivity to noise during the nighttime hours.
Equivalent Continuous Noise Level, L_{eq}	A level of steady state sound that in a stated time period, and a stated location, has the same A-weighted sound energy as the time-varying sound.
Fast/Slow Meter Response	The fast and slow meter responses are different settings on a sound level meter. The fast response setting takes a measurement every 100 milliseconds, while a slow setting takes one every second.
Frequency, Hertz	In a function periodic in time, the number of times that the quantity repeats itself in one second (i.e., the number of cycles per second).
L_{02}, L_{08}, L_{50}, L_{90}	The A-weighted noise levels that are equaled or exceeded by a fluctuating sound level, 2 percent, 8 percent, 50 percent, and 90 percent of a stated time period, respectively.
L_{max}, L_{min}	Lmax is the RMS (root mean squared) maximum level of a noise source or environment measured on a sound level meter, during a designated time interval, using fast meter response. Lmin is the minimum level.
Offensive/ Offending/Intrusive Noise	The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of sound depends on its amplitude, duration, frequency, and time of occurrence, and tonal information content as well as the prevailing ambient noise level.
Root Mean Square (RMS)	A measure of the magnitude of a varying noise source quantity. The name derives from the calculation of the square root of the mean of the squares of the values. It can be calculated from either a series of lone values or a continuous varying function.

APPENDIX C

NOISE MEASUREMENT FIELD WORKSHEET

Noise Measurement
Field Data

Project Name: 27195 Almond Avenue Warehouse, City of Redlands. **Date:** June 6, 2022

Project #: 19518

Noise Measurement #: STNM1 Run Time: 15 minutes (1 x 15 minutes) **Technician:** Ian Edward Gallagher

Nearest Address or Cross Street: 27081 Almond Avenue, Redlands, CA 92374

Site Description (Type of Existing Land Use and any other notable features): Project Site: Orange trees w/ one residence, bordered by Almond Ave to north, commercial to east, commercial & multi-family residential to south, & industrial to west. Noise Measurement Site: Taken along western project property line, project site to north/east/south & industrial use (& associated parking areas) to west.

Weather: Clear skies sunshine **Settings:** SLOW FAST

Temperature: 83 deg F **Wind:** 7mph **Humidity:** 41% **Terrain:** Flat

Start Time: 1:46 PM **End Time:** 2:01 PM **Run Time:**

Leq: 51.7 dB **Primary Noise Source:** Traffic ambiance from vehicles traveling along Almond Avenue & Alabama Street.

Lmax 67.4 dB Traffic ambiance from other roads.

L2 60.9 dB **Secondary Noise Sources:** Leaf rustle from breeze. Bird song. Warehouse & storage yard ambiance.

L8 53.6 dB Occasional overhead air traffic.

L25 49.6 dB

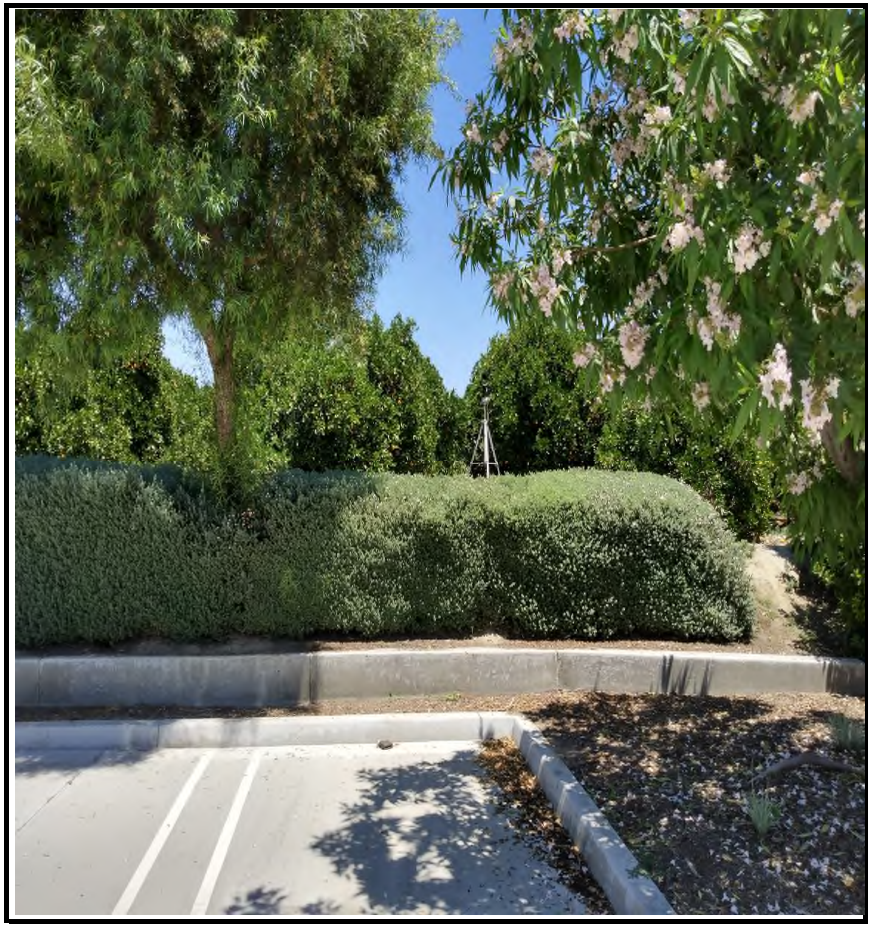
L50 47.6 dB

NOISE METER:	SoundTrack LXT Class 1	**CALIBRATOR:**	Larson Davis CAL 200
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT1	**MODEL:**	CAL 200
SERIAL NUMBER:	3855	**SERIAL NUMBER:**	11178
FACTORY CALIBRATION DATE:	6/7/2021	**FACTORY CALIBRATION DATE:**	6/8/2021
FIELD CALIBRATION DATE:	6/6/2022		

Noise Measurement
Field Data

PHOTOS:

STNM1 looking North along eastern access road to building 27081 Almond Ave, towards Almond Ave intersection.



STNM1 looking east from access road (27081 Almond Ave) towards meter in orange grove.

Summary	
File Name on Meter	LxT_Data.022.s
File Name on PC	LxT_0003855-20220606 134605-LxT_Data.022.ldbin
Serial Number	3855
Model	SoundTrack LxT®
Firmware Version	2.404
User	Ian Edward Gallagher
Location	STNM1 34° 4'22.80"N 117°12'47.13"W
Job Description	15 minute noise measutement (1 x 15 minutes)
Note	Ganddini Project 19518 ,27195 Almond Ave Warehouse, Redlands.

Measurement	
Start	2022-06-06 13:46:05
Stop	2022-06-06 14:01:05
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre-Calibration	2022-06-06 13:45:34
Post-Calibration	None

Overall Settings	
RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1
Microphone Correction	Off
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	Bin Max
Overload	145.2 dB

Results			
LA_{eq}	51.7		
LAE	81.2		
EA	14.76691	µPa²h	
EA8	472.5411	µPa²h	
EA40	2.362705	mPa²h	
$LA_{peak\ (max)}$	2022-06-06 13:59:30	81.7	dB
LAS_{max}	2022-06-06 13:52:50	67.4	dB
LAS_{min}	2022-06-06 13:58:42	42.4	dB

		Statistics	
LC_{eq}	64.8 dB	**LA2.00**	60.9 dB
LA_{eq}	51.7 dB	**LA8.00**	53.6 dB
LC_{eq} - LA_{eq}	13.1 dB	**LA25.00**	49.6 dB
LAI_{eq}	53.8 dB	**LA50.00**	47.6 dB
LA_{eq}	51.7 dB	**LA66.60**	46.4 dB
LAI_{eq} - LA_{eq}	2.2 dB	**LA90.00**	44.4 dB
Overload Count	0		

Measurement Report

Report Summary

Meter's File Name	LxT_Data.022.s	Computer's File Name	LxT_0003855-20220606 134605-LxT_Data.022.ldbin
Meter	LxT1 0003855		
Firmware	2.404		
User	Ian Edward Gallagher	Location	STNM1 34° 4'22.80"N 117°12'47.13"W
Job Description	15 minute noise measutement (1 x 15 minutes)		
Note	Ganddini Project 19518 ,27195 Almond Ave Warehouse, Redlands.		
Start Time	2022-06-06 13:46:05	Duration	0:15:00.0
End Time	2022-06-06 14:01:05	Run Time	0:15:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	51.7 dB		
LAE	81.2 dB	SEA	--- dB
EA	14.8 µPa²h	LAFTM5	55.5 dB
EA8	472.5 µPa²h		
EA40	2.4 mPa²h		
LA_{peak}	81.7 dB	2022-06-06 13:59:30	
LAS_{max}	67.4 dB	2022-06-06 13:52:50	
LAS_{min}	42.4 dB	2022-06-06 13:58:42	
LA_{eq}	51.7 dB		
LC_{eq}	64.8 dB	LC_{eq} - LA_{eq}	13.1 dB
LAI_{eq}	53.8 dB	LAI_{eq} - LA_{eq}	2.2 dB

Exceedances

	Count	Duration
LAS > 65.0 dB	2	0:00:10.0
LAS > 85.0 dB	0	0:00:00.0
LApeak > 135.0 dB	0	0:00:00.0
LApeak > 137.0 dB	0	0:00:00.0
LApeak > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight
--- dB	--- dB	0.0 dB

LDEN	LDay	LEve	LNight
--- dB	--- dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	51.7 dB		64.8 dB		--- dB	
$L_{S(max)}$	67.4 dB	2022-06-06 13:52:50	--- dB		--- dB	
$L_{S(min)}$	42.4 dB	2022-06-06 13:58:42	--- dB		--- dB	
$L_{Peak(max)}$	81.7 dB	2022-06-06 13:59:30	--- dB		--- dB	

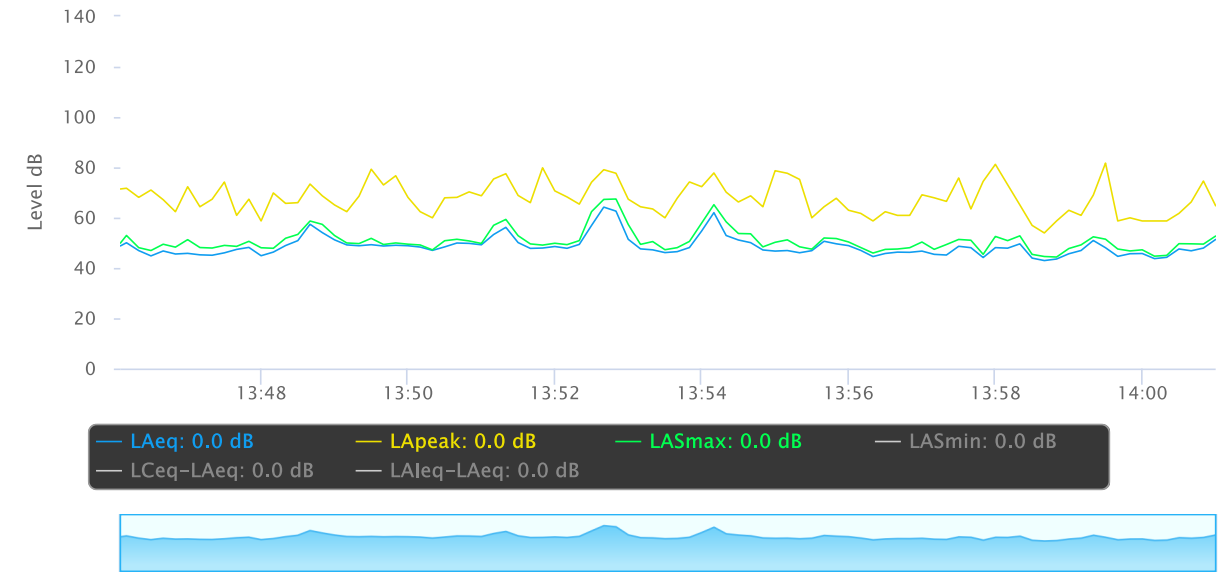
Overloads

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

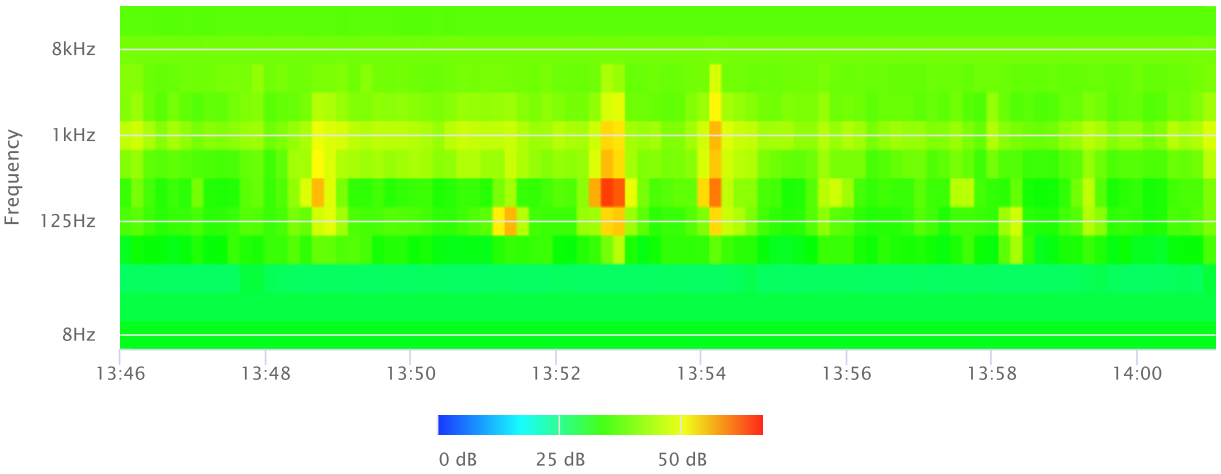
Statistics

LAS 2.0	60.9 dB
LAS 8.0	53.6 dB
LAS 25.0	49.6 dB
LAS 50.0	47.6 dB
LAS 66.6	46.4 dB
LAS 90.0	44.4 dB

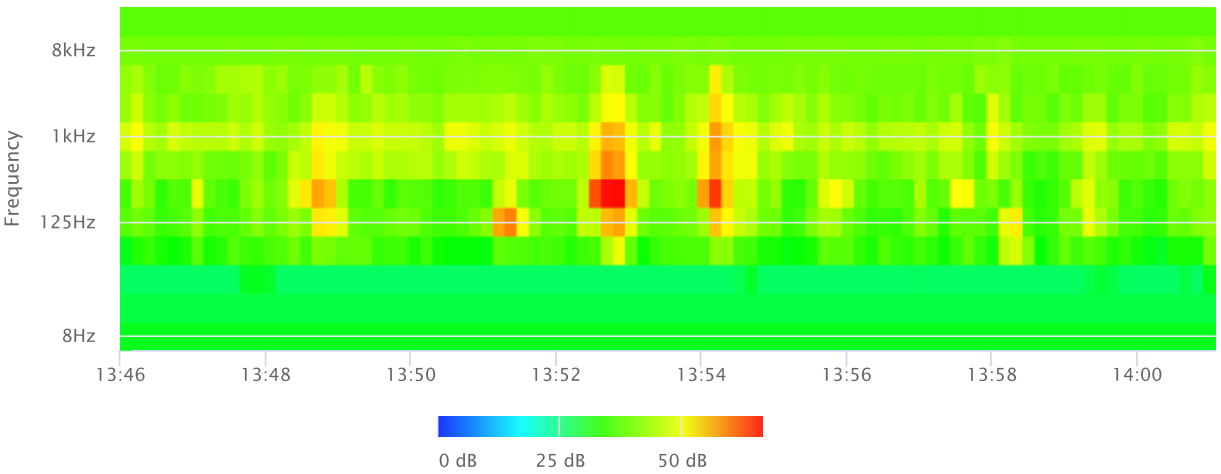
Time History



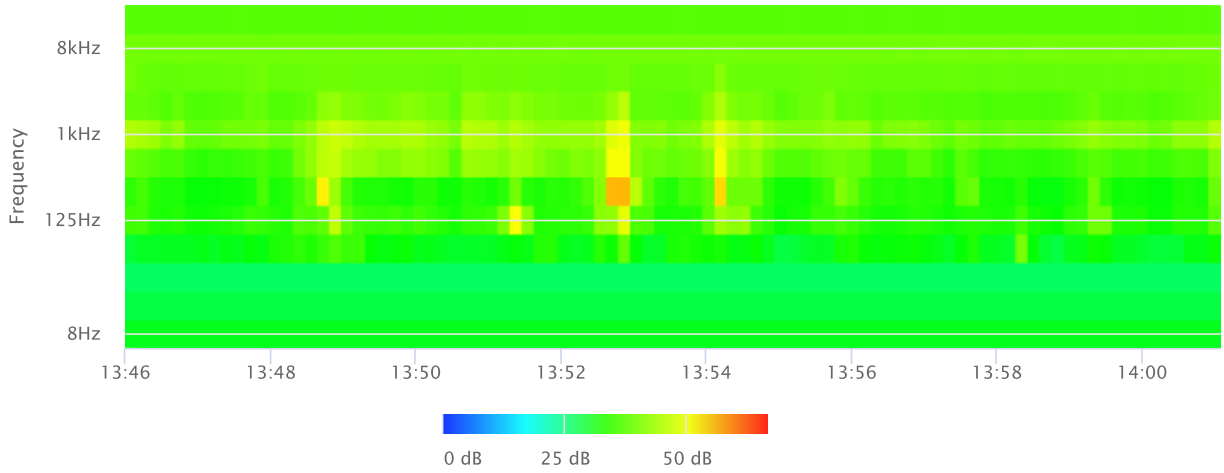
OBA 1/1 Leq



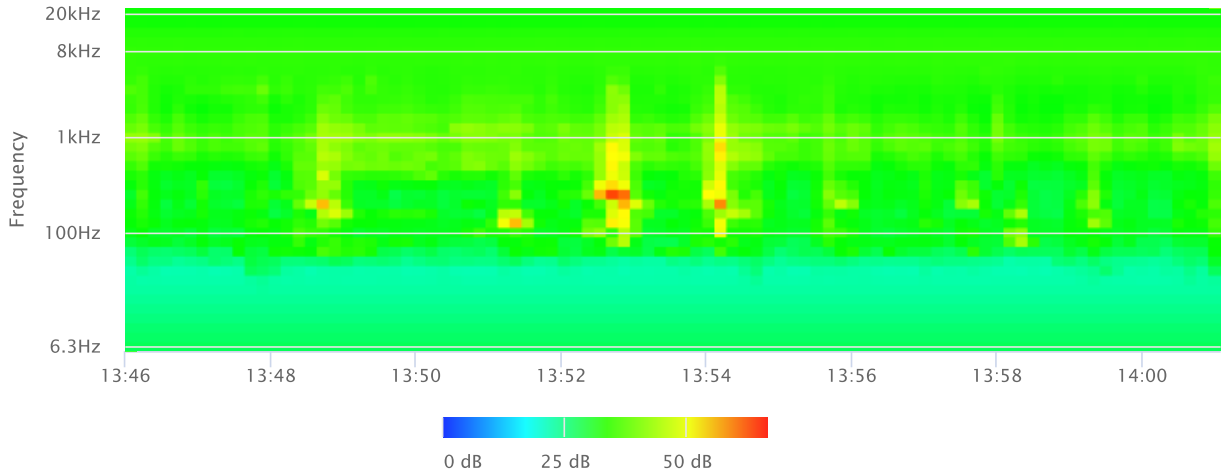
OBA 1/1 Lmax



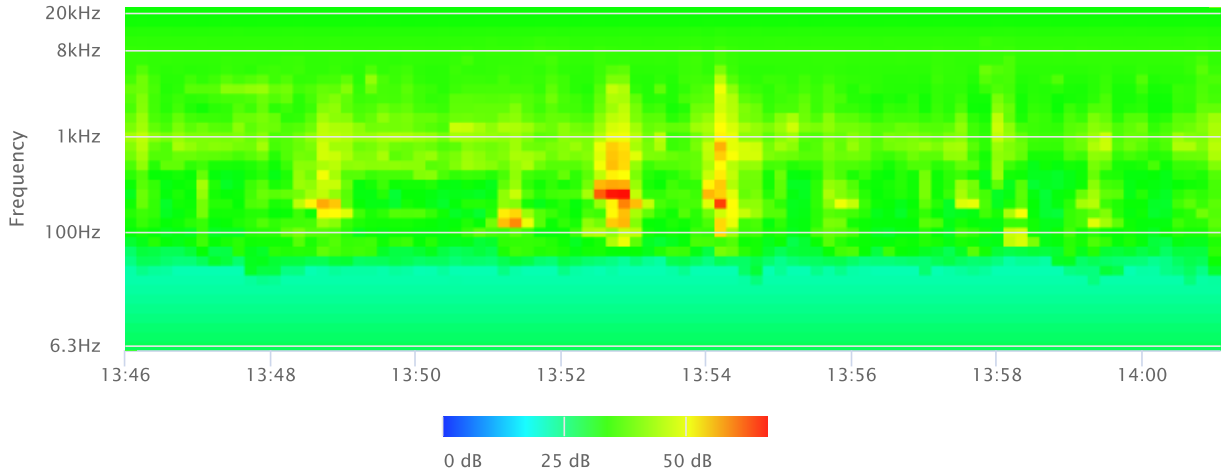
OBA 1/1 Lmin



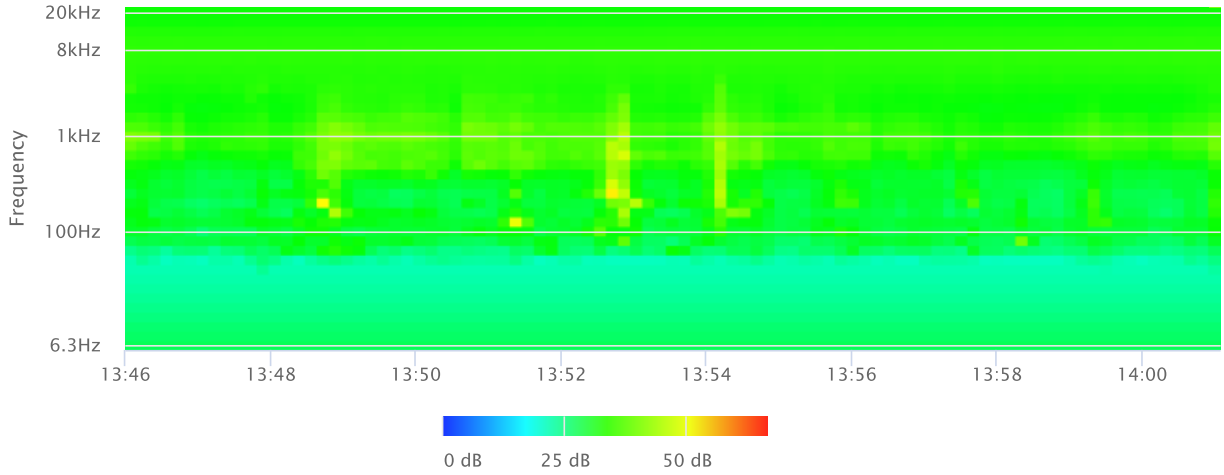
OBA 1/3 Leq



OBA 1/3 Lmax



OBA 1/3 Lmin


20kHz
8kHz
1kHz
100Hz
6.3Hz
Frequency
13:46
13:48
13:50
13:52
13:54
13:56
13:58
14:00
0 dB
25 dB
50 dB

Noise Measurement
Field Data

Project Name: 27195 Almond Avenue Warehouse, City of Redlands. **Date:** June 6, 2022

Project #: 19518

Noise Measurement #: STNM2 Run Time: 15 minutes (1 x 15 minutes) **Technician:** Ian Edward Gallagher

Nearest Address or Cross Street: 27195 Almond Avenue, Redlands, CA 92374

Site Description (Type of Existing Land Use and any other notable features): Project Site: Orange trees w/ one residence, bordered by Almond Ave to north, commercial to east, commercial & multi-family residential to south, & industrial to west. Noise Measurement Site: Industrial use (w/ associated parking areas) to north & Almond Ave to south with project site & existing single-family residence further south.

Weather: Clear skies sunshine **Settings:** SLOW FAST

Temperature: 83 deg F **Wind:** 7mph **Humidity:** 41% **Terrain:** Flat

Start Time: 2:20 PM **End Time:** 2:35 PM **Run Time:**

Leq: 65 dB

Lmax 83.7 dB

L2 74.3 dB

L8 69.4 dB

L25 62.8 dB

L50 56.9 dB

Primary Noise Source: Traffic noise from the 56 vehicles passing microphone, traveling along Almond Avenue during measurement. Traffic ambiance from other roads.

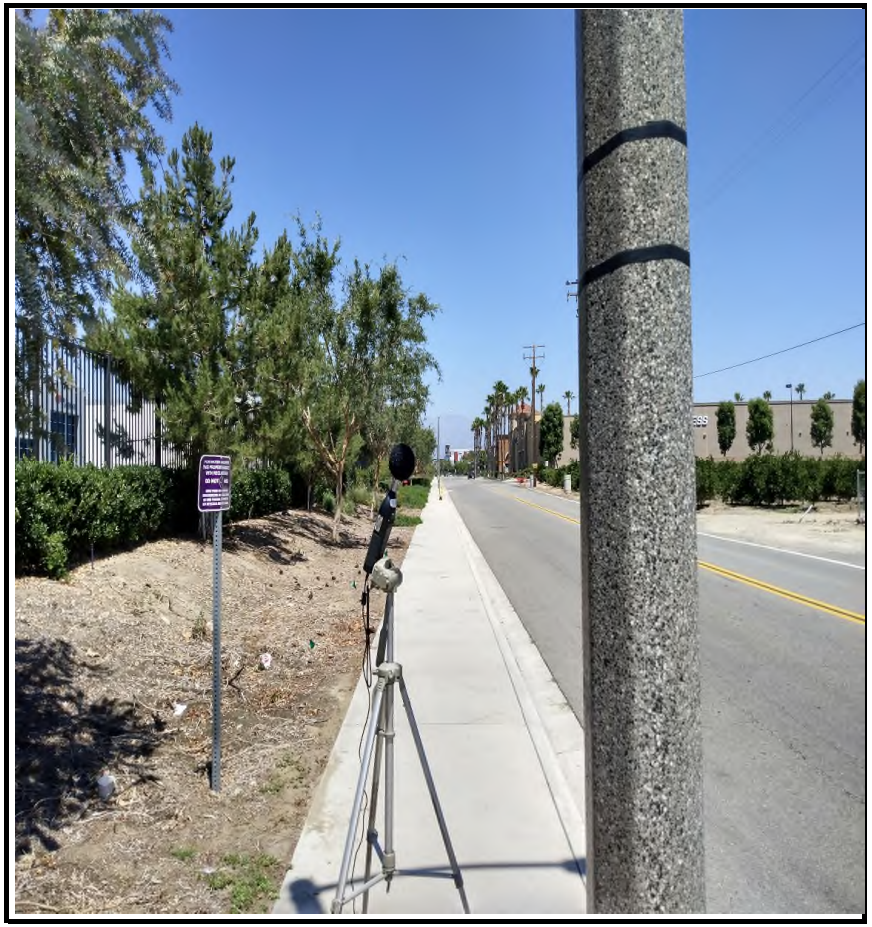
Secondary Noise Sources: Leaf rustle from breeze. Bird song. Warehouse & storage yard ambiance. Occasional overhead air traffic.

NOISE METER:	SoundTrack LXT Class 1	**CALIBRATOR:**	Larson Davis CAL 200
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT1	**MODEL:**	CAL 200
SERIAL NUMBER:	3855	**SERIAL NUMBER:**	11178
FACTORY CALIBRATION DATE:	6/7/2021	**FACTORY CALIBRATION DATE:**	6/8/2021
FIELD CALIBRATION DATE:	6/6/2022		

Noise Measurement
Field Data

PHOTOS:

STNM2 looking S across Almond Ave towards frontyard of residence 27195 Almond Avenue, Redlands.



STNM2 looking E down Almond Avenue towards Alabama Street intersection.

Summary	
File Name on Meter	LxT_Data.023.s
File Name on PC	LxT_0003855-20220606 142030-LxT_Data.023.ldbin
Serial Number	3855
Model	SoundTrack LxT®
Firmware Version	2.404
User	Ian Edward Gallagher
Location	STNM2 34° 4'26.47"N 117°12'43.44"W
Job Description	15 minute noise measutement (1 x 15 minutes)
Note	Ganddini Project 19518 ,27195 Almond Ave Warehouse, Redlands.

Measurement	
Start	2022-06-06 14:20:30
Stop	2022-06-06 14:35:30
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre-Calibration	2022-06-06 14:16:32
Post-Calibration	None

Overall Settings	
RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1
Microphone Correction	Off
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	Bin Max
Overload	145.2 dB

Results			
LA_{eq}	65.0		
LAE	94.5		
EA	315.21 µPa²h		
EA8	10.08672 mPa²h		
EA40	50.4336 mPa²h		
$LA_{peak\ (max)}$	2022-06-06 14:28:07	98.2 dB	
LAS_{max}	2022-06-06 14:28:07	83.7 dB	
LAS_{min}	2022-06-06 14:21:49	51.0 dB	

		Statistics	
LC_{eq}	72.2 dB	**LA2.00**	74.3 dB
LA_{eq}	65.0 dB	**LA8.00**	69.4 dB
LC_{eq} - LA_{eq}	7.3 dB	**LA25.00**	62.8 dB
LAI_{eq}	67.4 dB	**LA50.00**	56.9 dB
LA_{eq}	65.0 dB	**LA66.60**	55.1 dB
LAI_{eq} - LA_{eq}	2.4 dB	**LA90.00**	52.7 dB
Overload Count	0		

Measurement Report

Report Summary

Meter's File Name	LxT_Data.023.s	Computer's File Name	LxT_0003855-20220606 142030-LxT_Data.023.ldbin
Meter	LxT1 0003855		
Firmware	2.404		
User	Ian Edward Gallagher	Location	STNM2 34° 4'26.47"N 117°12'43.44"W
Job Description	15 minute noise measutement (1 x 15 minutes)		
Note	Ganddini Project 19518 ,27195 Almond Ave Warehouse, Redlands.		
Start Time	2022-06-06 14:20:30	Duration	0:15:00.0
End Time	2022-06-06 14:35:30	Run Time	0:15:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	65.0 dB		
LAE	94.5 dB	SEA	--- dB
EA	315.2 µPa²h	LAFTM5	70.7 dB
EA8	10.1 mPa²h		
EA40	50.4 mPa²h		
LA_{peak}	98.2 dB	2022-06-06 14:28:07	
LAS_{max}	83.7 dB	2022-06-06 14:28:07	
LAS_{min}	51.0 dB	2022-06-06 14:21:49	
LA_{eq}	65.0 dB		
LC_{eq}	72.2 dB	LC_{eq} - LA_{eq}	7.3 dB
LAI_{eq}	67.4 dB	LAI_{eq} - LA_{eq}	2.4 dB

Exceedances	Count	Duration
LAS > 65.0 dB	34	0:03:20.1
LAS > 85.0 dB	0	0:00:00.0
LApeak > 135.0 dB	0	0:00:00.0
LApeak > 137.0 dB	0	0:00:00.0
LApeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight
	--- dB	--- dB	0.0 dB

	LDEN	LDay	LEve	LNight
	--- dB	--- dB	--- dB	--- dB

Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	65.0 dB		72.2 dB		--- dB	
$L_{S(max)}$	83.7 dB	2022-06-06 14:28:07	--- dB		--- dB	
$L_{S(min)}$	51.0 dB	2022-06-06 14:21:49	--- dB		--- dB	
$L_{Peak(max)}$	98.2 dB	2022-06-06 14:28:07	--- dB		--- dB	

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

Statistics

LAS 2.0	74.3 dB
LAS 8.0	69.4 dB
LAS 25.0	62.8 dB
LAS 50.0	56.9 dB
LAS 66.6	55.1 dB
LAS 90.0	52.7 dB

Noise Measurement
Field Data

Project Name: 27195 Almond Avenue Warehouse, City of Redlands. **Date:** June 6, 2022

Project #: 19518

Noise Measurement #: STNM3 Run Time: 15 minutes (1 x 15 minutes) **Technician:** Ian Edward Gallagher

Nearest Address or Cross Street: 9940 Alabama Street, Redlands, CA 92374

Site Description (Type of Existing Land Use and any other notable features): Project Site: Orange trees w/ one residence, bordered by Almond Ave to north, commercial to east, commercial & multi-family residential to south, & industrial to west. Noise Measurement Site: Commercial parking area to north/east/south with associated commercial buildings further east & project site to west.

Weather: Clear skies sunshine **Settings:** SLOW FAST

Temperature: 83 deg F **Wind:** 7mph **Humidity:** 41% **Terrain:** Flat

Start Time: 2:54 PM **End Time:** 3:04 PM **Run Time:**

Leq: 53.9 dB **Primary Noise Source:** Traffic ambiance from vehicles traveling along Almond Avenue, Alabama Street,

Lmax 64.4 dB Lugonia Avenue during measurement. Traffic ambiance from other roads.

L2 61.0 dB **Secondary Noise Sources:** Leaf rustle from breeze. Bird song. Warehouse & storage yard ambiance.

L8 58.5 dB Occasional overhead air traffic.

L25 54.8 dB

L50 50.2 dB

NOISE METER:	SoundTrack LXT Class 1	**CALIBRATOR:**	Larson Davis CAL 200
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT1	**MODEL:**	CAL 200
SERIAL NUMBER:	3855	**SERIAL NUMBER:**	11178
FACTORY CALIBRATION DATE:	6/7/2021	**FACTORY CALIBRATION DATE:**	6/8/2021
FIELD CALIBRATION DATE:	6/6/2022		

Noise Measurement
Field Data

PHOTOS:

STNM3 looking N up access road towards intersection with Almond Avenue. Backside of building 9940 Alabama Street on the right of the image.

STNM3 looking SSE down access road, back of building 9980 Alabama Street on the left of the image.

Summary	
File Name on Meter	LxT_Data.024.s
File Name on PC	LxT_0003855-20220606 145425-LxT_Data.024.ldbin
Serial Number	3855
Model	SoundTrack LxT®
Firmware Version	2.404
User	Ian Edward Gallagher
Location	STNM3 34° 4'22.99"N 117°12'39.10"W
Job Description	15 minute noise measutement (1 x 15 minutes)
Note	Ganddini Project 19518 ,27195 Almond Ave Warehouse, Redlands.

Measurement	
Start	2022-06-06 14:54:25
Stop	2022-06-06 15:09:25
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre-Calibration	2022-06-06 14:53:51
Post-Calibration	None

Overall Settings	
RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1
Microphone Correction	Off
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	Bin Max
Overload	145.4 dB

Results			
LA_{eq}	53.9		
LAE	83.4		
EA	24.43342	µPa²h	
EA8	781.8694	µPa²h	
EA40	3.909347	mPa²h	
$LA_{peak\ (max)}$	2022-06-06 15:07:05	86.0	dB
LAS_{max}	2022-06-06 15:07:05	64.4	dB
LAS_{min}	2022-06-06 14:54:50	45.9	dB

		Statistics	
LC_{eq}	64.1 dB	**LA2.00**	61.0 dB
LA_{eq}	53.9 dB	**LA8.00**	58.5 dB
LC_{eq} - LA_{eq}	10.2 dB	**LA25.00**	54.8 dB
LAI_{eq}	63.4 dB	**LA50.00**	50.2 dB
LA_{eq}	53.9 dB	**LA66.60**	48.7 dB
LAI_{eq} - LA_{eq}	9.6 dB	**LA90.00**	47.2 dB
Overload Count	0		

Measurement Report

Report Summary

Meter's File Name	LxT_Data.024.s	Computer's File Name	LxT_0003855-20220606 145425-LxT_Data.024.ldbin
Meter	LxT1 0003855		
Firmware	2.404		
User	Ian Edward Gallagher	Location	STNM3 34° 4'22.99"N 117°12'39.10"W
Job Description	15 minute noise measutement (1 x 15 minutes)		
Note	Ganddini Project 19518 ,27195 Almond Ave Warehouse, Redlands.		
Start Time	2022-06-06 14:54:25	Duration	0:15:00.0
End Time	2022-06-06 15:09:25	Run Time	0:15:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	53.9 dB		
LAE	83.4 dB	SEA	--- dB
EA	24.4 µPa²h	LAFTM5	62.9 dB
EA8	781.9 µPa²h		
EA40	3.9 mPa²h		
LA_{peak}	86.0 dB	2022-06-06 15:07:05	
LAS_{max}	64.4 dB	2022-06-06 15:07:05	
LAS_{min}	45.9 dB	2022-06-06 14:54:50	
LA_{eq}	53.9 dB		
LC_{eq}	64.1 dB	LC_{eq} - LA_{eq}	10.2 dB
LAI_{eq}	63.4 dB	LAI_{eq} - LA_{eq}	9.6 dB

Exceedances

	Count	Duration
LAS > 65.0 dB	0	0:00:00.0
LAS > 85.0 dB	0	0:00:00.0
LApeak > 135.0 dB	0	0:00:00.0
LApeak > 137.0 dB	0	0:00:00.0
LApeak > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight
--- dB	--- dB	0.0 dB

LDEN	LDay	LEve	LNight
--- dB	--- dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	53.9 dB		64.1 dB		--- dB	
$L_{S(max)}$	64.4 dB	2022-06-06 15:07:05	--- dB		--- dB	
$L_{S(min)}$	45.9 dB	2022-06-06 14:54:50	--- dB		--- dB	
$L_{Peak(max)}$	86.0 dB	2022-06-06 15:07:05	--- dB		--- dB	

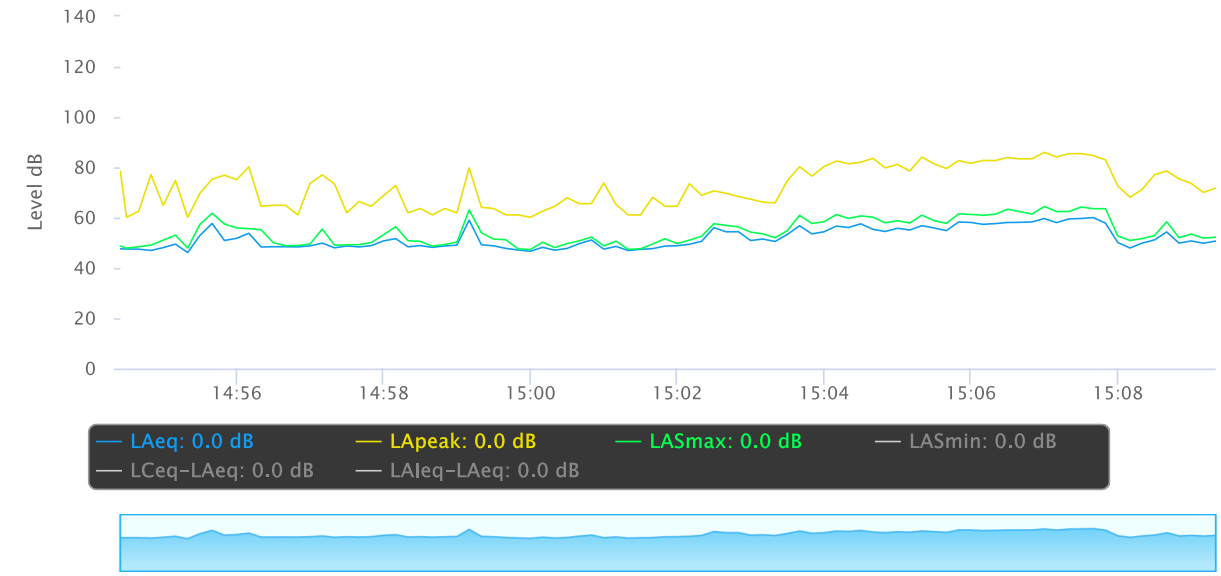
Overloads

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

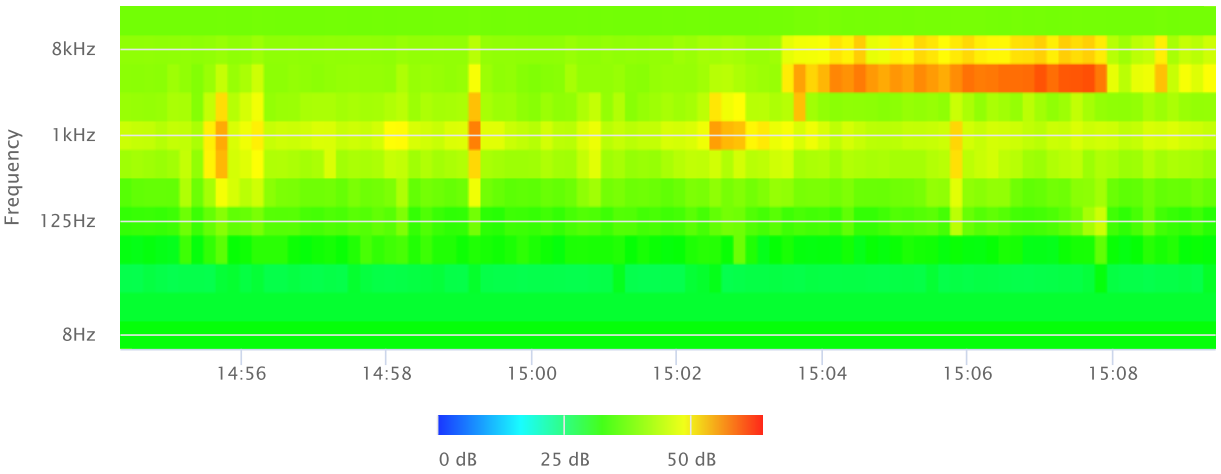
Statistics

LAS 2.0	61.0 dB
LAS 8.0	58.5 dB
LAS 25.0	54.8 dB
LAS 50.0	50.2 dB
LAS 66.6	48.7 dB
LAS 90.0	47.2 dB

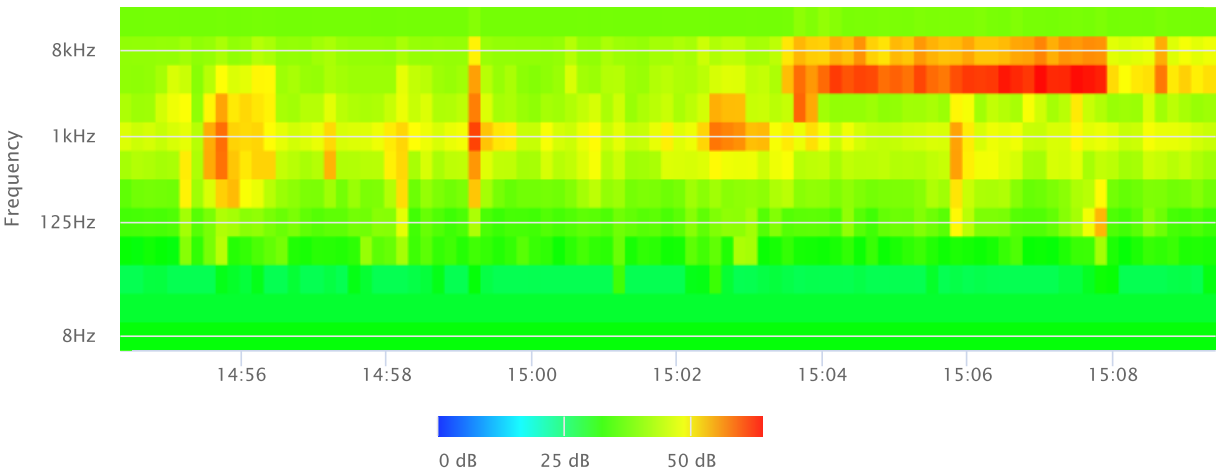
Time History



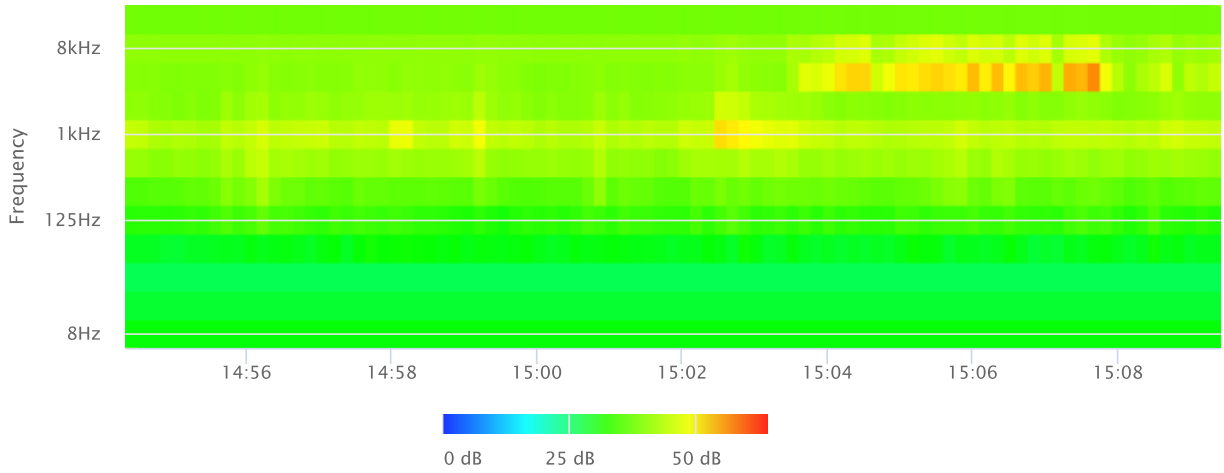
OBA 1/1 Leq



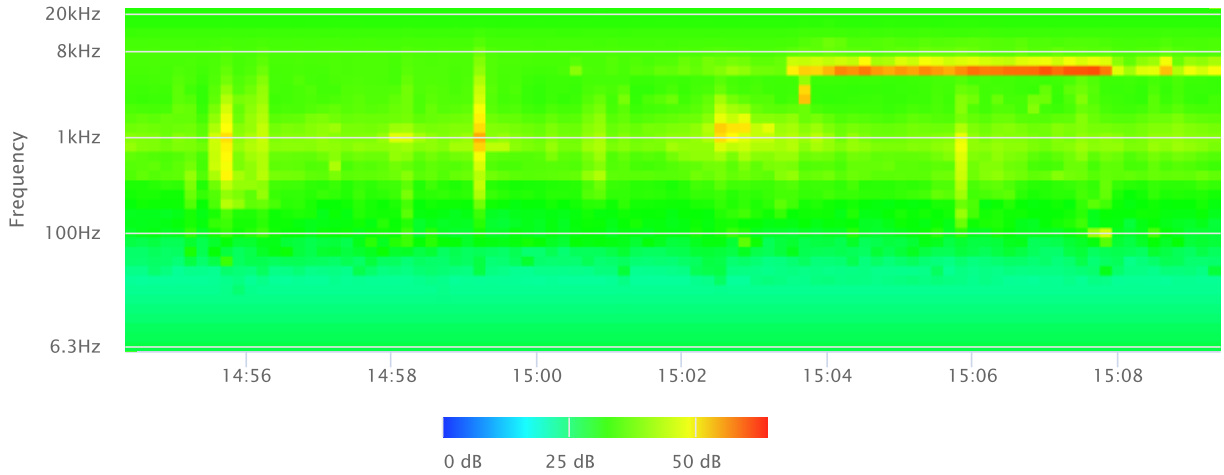
OBA 1/1 Lmax



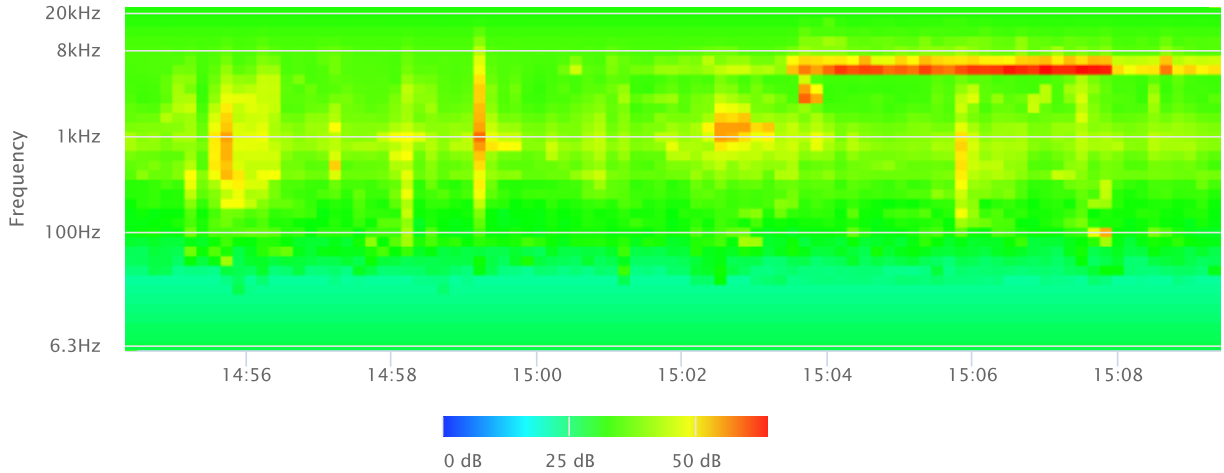
OBA 1/1 Lmin



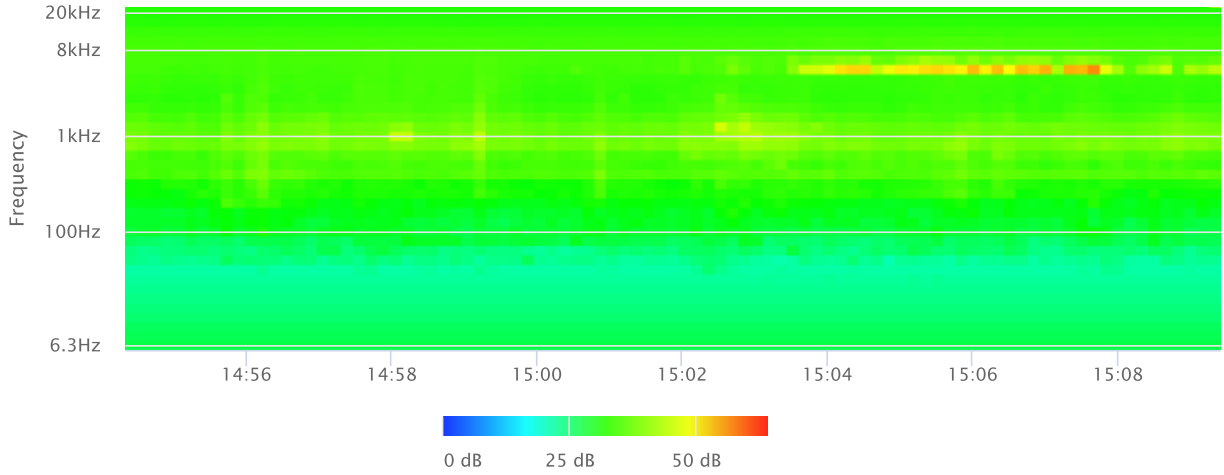
OBA 1/3 Leq



OBA 1/3 Lmax



OBA 1/3 Lmin


20kHz
8kHz
1kHz
100Hz
6.3Hz
Frequency
14:56
14:58
15:00
15:02
15:04
15:06
15:08
0 dB
25 dB
50 dB

Noise Measurement
Field Data

Project Name: 27195 Almond Avenue Warehouse, City of Redlands. **Date:** June 6, 2022

Project #: 19518

Noise Measurement #: STNM4 Run Time: 15 minutes (1 x 15 minutes) **Technician:** Ian Edward Gallagher

Nearest Address or Cross Street: Alabama Street & Almond Avenue, Redlands, CA 92374

Site Description (Type of Existing Land Use and any other notable features): Project Site: Orange trees w/ one residence, bordered by Almond Ave to north, commercial to east, commercial & multi-family residential to south, & industrial to west. Noise Measurement Site: Measurement taken within a multi-family residential parking area w/ residential buildings to north, Almond Ave to south, & Alabama St to west with industrial uses further west.

Weather: Clear skies sunshine **Settings:** SLOW FAST

Temperature: 83 deg F **Wind:** 7mph **Humidity:** 41% **Terrain:** Flat

Start Time: 3:50 PM **End Time:** 4:05 PM **Run Time:**

Leq: 58.3 dB **Primary Noise Source:** Traffic Noise from Alabama Street & Almond Avenue. Traffic ambiance from

Lmax 69.1 dB other surrounding rooads.

L2 66.0 dB **Secondary Noise Sources:** Leaf rustle from breeze. Bird song. Warehouse & storage yard ambiance.

L8 62.6 dB Occasional overhead air traffic.

L25 58.3 dB

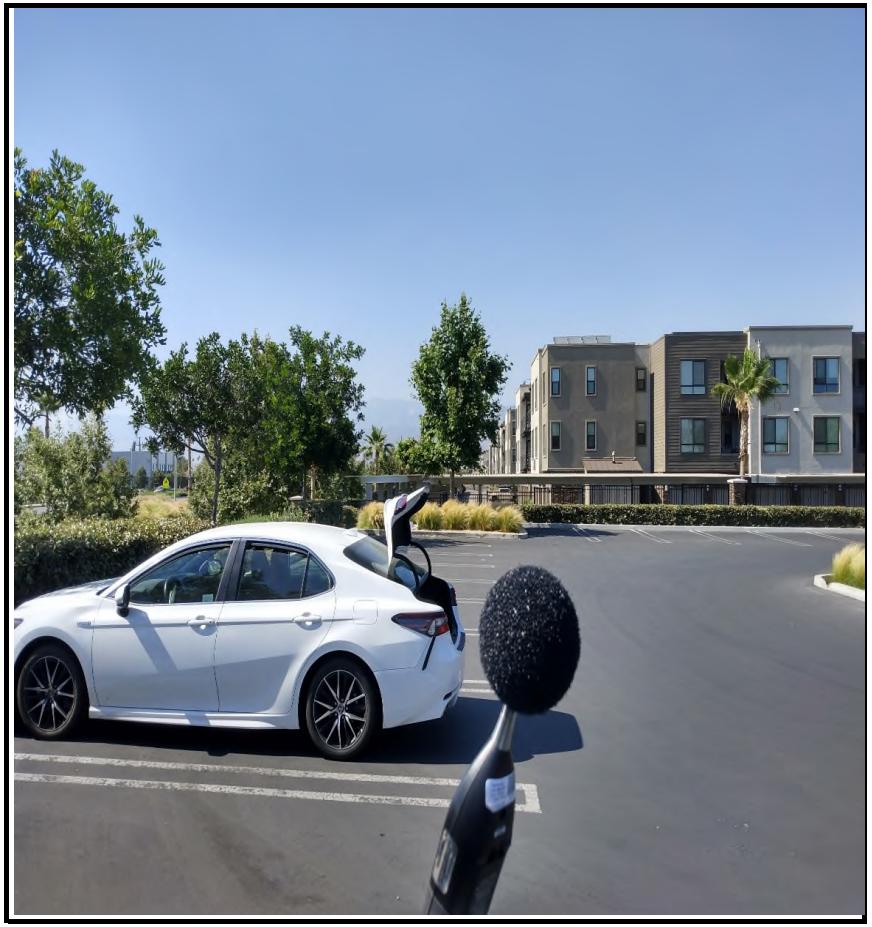
L50 55.3 dB

NOISE METER:	SoundTrack LXT Class 1	**CALIBRATOR:**	Larson Davis CAL 200
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT1	**MODEL:**	CAL 200
SERIAL NUMBER:	3855	**SERIAL NUMBER:**	11178
FACTORY CALIBRATION DATE:	6/7/2021	**FACTORY CALIBRATION DATE:**	6/8/2021
FIELD CALIBRATION DATE:	6/6/2022		

Noise Measurement
Field Data

PHOTOS:

STNM4 looking W from SW corner of parking lot across Alabama Street. Almond Ave/Alabama Street intersection to WSW (left side of image).



STNM4 looking N across parking lot towards multi-family residences.

Summary	
File Name on Meter	LxT_Data.025.s
File Name on PC	LxT_0003855-20220606 155035-LxT_Data.025.ldbin
Serial Number	3855
Model	SoundTrack LxT®
Firmware Version	2.404
User	Ian Edward Gallagher
Location	STNM4 34° 4'27.02"N 117°12'28.99"W
Job Description	15 minute noise measutement (1 x 15 minutes)
Note	Ganddini Project 19518 ,27195 Almond Ave Warehouse, Redlands.

Measurement	
Start	2022-06-06 15:50:35
Stop	2022-06-06 16:05:35
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre-Calibration	2022-06-06 15:50:06
Post-Calibration	None

Overall Settings	
RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1
Microphone Correction	Off
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	Bin Max
Overload	145.2 dB

Results			
LA_{eq}	58.3		
LAE	87.8		
EA	66.93342	µPa²h	
EA8	2.141869	mPa²h	
EA40	10.70935	mPa²h	
$LA_{peak\ (max)}$	2022-06-06 15:51:02	89.0	dB
LAS_{max}	2022-06-06 15:59:11	69.1	dB
LAS_{min}	2022-06-06 15:50:37	48.8	dB

			Statistics		
LC_{eq}	71.7	dB	**LA2.00**	66.0	dB
LA_{eq}	58.3	dB	**LA8.00**	62.6	dB
LC_{eq} - LA_{eq}	13.5	dB	**LA25.00**	58.3	dB
LAI_{eq}	59.9	dB	**LA50.00**	55.3	dB
LA_{eq}	58.3	dB	**LA66.60**	53.7	dB
LAI_{eq} - LA_{eq}	1.6	dB	**LA90.00**	51.3	dB
Overload Count	0				

Measurement Report

Report Summary

Meter's File Name	LxT_Data.025.s	Computer's File Name	LxT_0003855-20220606 155035-LxT_Data.025.ldbin
Meter	LxT1 0003855		
Firmware	2.404		
User	Ian Edward Gallagher	Location	STNM4 34° 4'27.02"N 117°12'28.99"W
Job Description	15 minute noise measutement (1 x 15 minutes)		
Note	Ganddini Project 19518 ,27195 Almond Ave Warehouse, Redlands.		
Start Time	2022-06-06 15:50:35	Duration	0:15:00.0
End Time	2022-06-06 16:05:35	Run Time	0:15:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	58.3 dB		
LAE	87.8 dB	SEA	--- dB
EA	66.9 µPa²h	LAFTM5	62.0 dB
EA8	2.1 mPa²h		
EA40	10.7 mPa²h		
LA_{peak}	89.0 dB	2022-06-06 15:51:02	
LAS_{max}	69.1 dB	2022-06-06 15:59:11	
LAS_{min}	48.8 dB	2022-06-06 15:50:37	
LA_{eq}	58.3 dB		
LC_{eq}	71.7 dB	LC_{eq} - LA_{eq}	13.5 dB
LAI_{eq}	59.9 dB	LAI_{eq} - LA_{eq}	1.6 dB

Exceedances	Count	Duration
LAS > 65.0 dB	8	0:00:39.4
LAS > 85.0 dB	0	0:00:00.0
LApeak > 135.0 dB	0	0:00:00.0
LApeak > 137.0 dB	0	0:00:00.0
LApeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight
	--- dB	--- dB	0.0 dB

	LDEN	LDay	LEve	LNight
	--- dB	--- dB	--- dB	--- dB

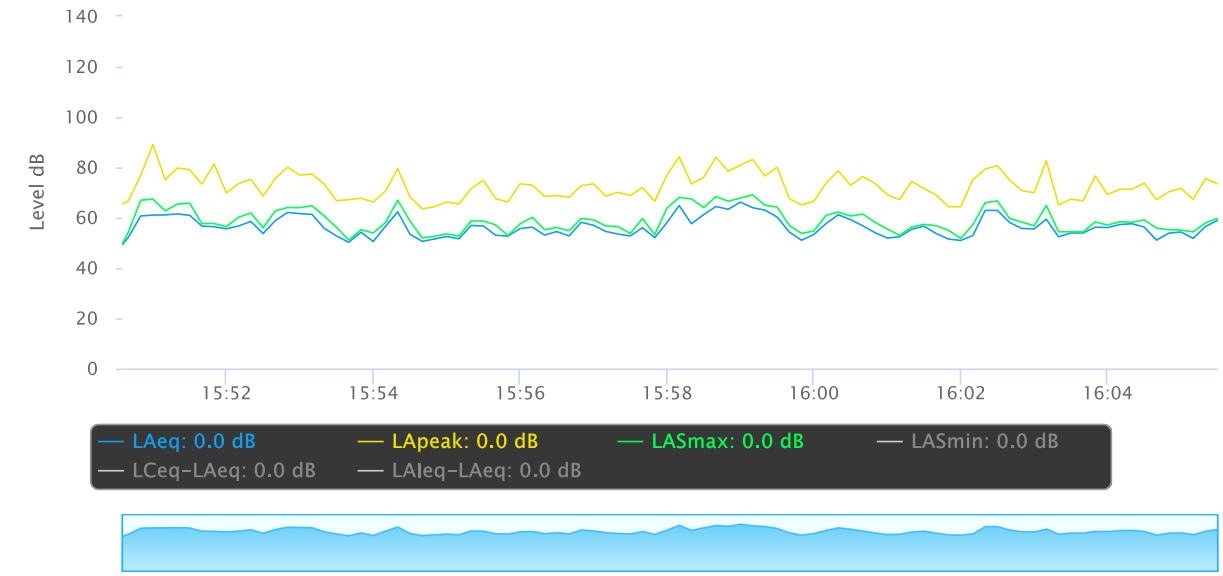
Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	58.3 dB		71.7 dB		--- dB	
$L_{S(max)}$	69.1 dB	2022-06-06 15:59:11	--- dB		--- dB	
$L_{S(min)}$	48.8 dB	2022-06-06 15:50:37	--- dB		--- dB	
$L_{Peak(max)}$	89.0 dB	2022-06-06 15:51:02	--- dB		--- dB	

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

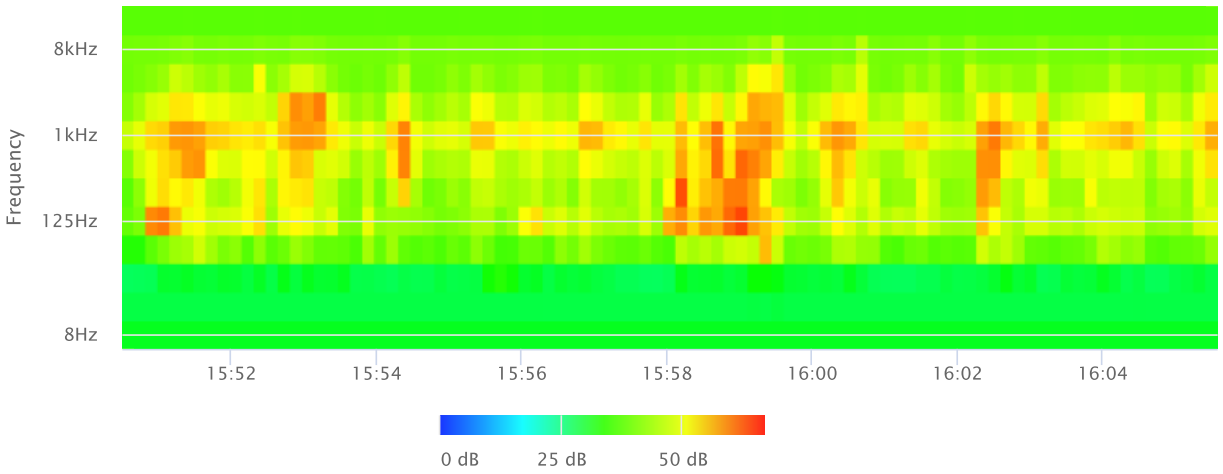
Statistics

LAS 2.0	66.0 dB
LAS 8.0	62.6 dB
LAS 25.0	58.3 dB
LAS 50.0	55.3 dB
LAS 66.6	53.7 dB
LAS 90.0	51.3 dB

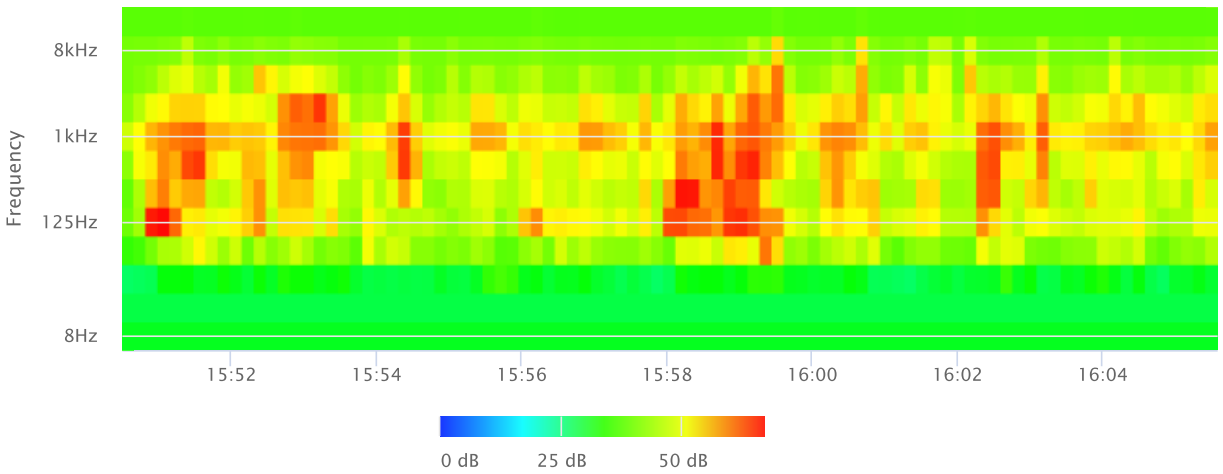
Time History



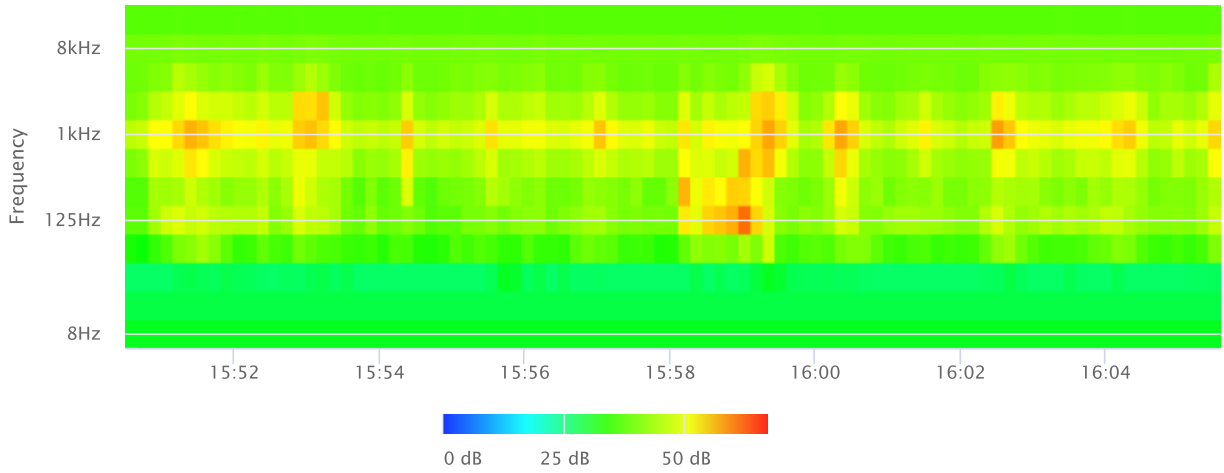
OBA 1/1 Leq



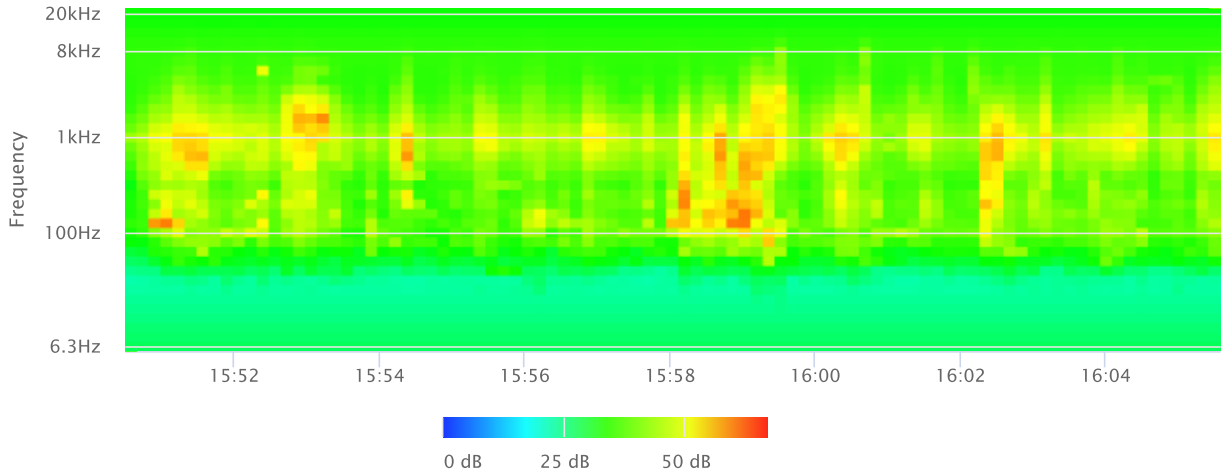
OBA 1/1 Lmax



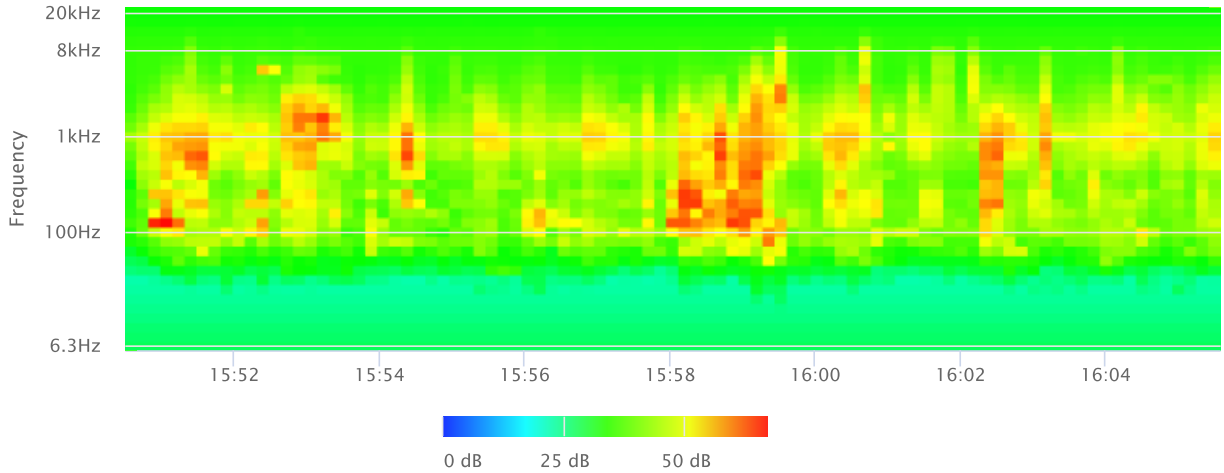
OBA 1/1 Lmin



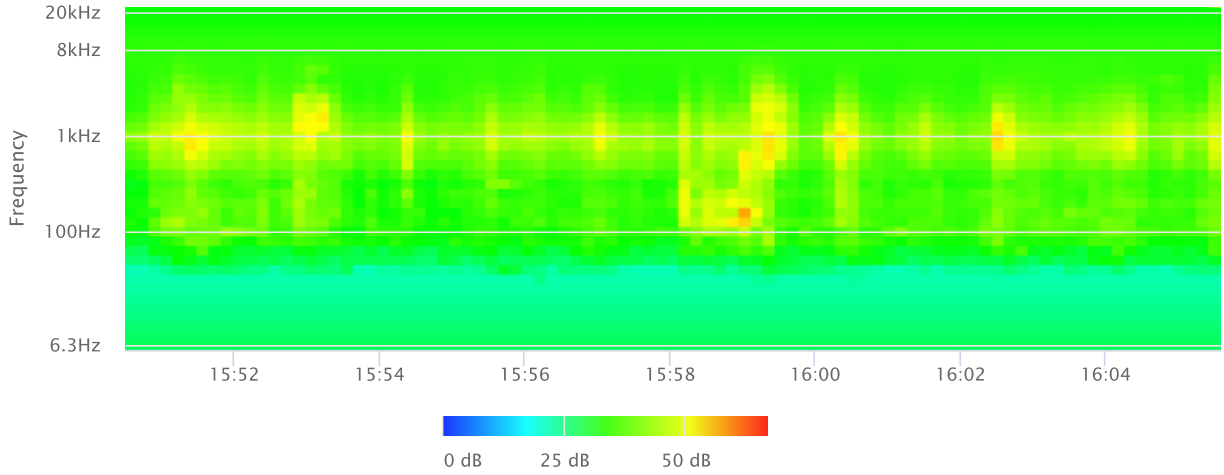
OBA 1/3 Leq



OBA 1/3 Lmax



OBA 1/3 Lmin


20kHz
8kHz
1kHz
100Hz
6.3Hz
Frequency
15:52
15:54
15:56
15:58
16:00
16:02
16:04
0 dB
25 dB
50 dB

Noise Measurement
Field Data

Project Name: 27195 Almond Avenue Warehouse, City of Redlands. **Date:** June 6, 2022

Project #: 19518

Noise Measurement #: STNM5 Run Time: 15 minutes (1 x 15 minutes) **Technician:** Ian Edward Gallagher

Nearest Address or Cross Street: 27165 San Bernardino Avenue, Redlands, CA 92374

Site Description (Type of Existing Land Use and any other notable features): Project Site: Orange trees w/ one residence, bordered by Almond Ave to north, commercial to east, commercial & multi-family residential to south, & industrial to west. Noise Measurement Site: Southwest corner of Packinghouse (church use) parking lot with industrial uses to the east and south and the church use (associated parking & buildings) to the north and west.

Weather: Clear skies sunshine **Settings:** SLOW FAST

Temperature: 83 deg F **Wind:** 7mph **Humidity:** 41% **Terrain:** Flat

Start Time: 4:26 PM **End Time:** 4:41 PM **Run Time:**

Leq: 50.3 dB **Primary Noise Source:** Traffic Noise from Alabama Street & San Bernardino Avenue. Traffic ambiance from

Lmax 62 dB other surrounding rooads.

L2 56.0 dB **Secondary Noise Sources:** Leaf rustle from breeze. Bird song. Warehouse & storage yard ambiance.

L8 49.4 dB Occasional overhead air traffic.

L25 50.8 dB

L50 49.4 dB

NOISE METER:	SoundTrack LXT Class 1	**CALIBRATOR:**	Larson Davis CAL 200
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT1	**MODEL:**	CAL 200
SERIAL NUMBER:	3855	**SERIAL NUMBER:**	11178
FACTORY CALIBRATION DATE:	6/7/2021	**FACTORY CALIBRATION DATE:**	6/8/2021
FIELD CALIBRATION DATE:	6/6/2022		

Noise Measurement
Field Data

PHOTOS:

STNM5 looking N across parking lot towards San Bernardino Ave.

STNM5 looking NW across parking lot towards building 27165 San Bernardino Avenue, Redlands.

Summary	
File Name on Meter	LxT_Data.026.s
File Name on PC	LxT_0003855-20220606 162653-LxT_Data.026.ldbin
Serial Number	3855
Model	SoundTrack LxT®
Firmware Version	2.404
User	Ian Edward Gallagher
Location	STNM5 34° 4'33.18"N 117°12'39.86"W
Job Description	15 minute noise measutement (1 x 15 minutes)
Note	Ganddini Project 19518 ,27195 Almond Ave Warehouse, Redlands.

Measurement	
Start	2022-06-06 16:26:53
Stop	2022-06-06 16:41:53
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre-Calibration	2022-06-06 16:26:32
Post-Calibration	None

Overall Settings	
RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1
Microphone Correction	Off
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	Bin Max
Overload	145.3 dB

Results			
LA_{eq}	50.3		
LAE	79.8		
EA	10.60492 µPa²h		
EA8	339.3575 µPa²h		
EA40	1.696787 mPa²h		
$LA_{peak\ (max)}$	2022-06-06 16:29:01	79.1 dB	
LAS_{max}	2022-06-06 16:30:27	62.0 dB	
LAS_{min}	2022-06-06 16:29:13	45.4 dB	

		Statistics	
LC_{eq}	66.0 dB	**LA2.00**	56.0 dB
LA_{eq}	50.3 dB	**LA8.00**	52.3 dB
LC_{eq} - LA_{eq}	15.7 dB	**LA25.00**	50.8 dB
LAI_{eq}	51.5 dB	**LA50.00**	49.4 dB
LA_{eq}	50.3 dB	**LA66.60**	48.4 dB
LAI_{eq} - LA_{eq}	1.3 dB	**LA90.00**	47.0 dB
Overload Count	0		

Measurement Report

Report Summary

Meter's File Name	LxT_Data.026.s	Computer's File Name	LxT_0003855-20220606 162653-LxT_Data.026.ldbin
Meter	LxT1 0003855		
Firmware	2.404		
User	Ian Edward Gallagher	Location	STNM5 34° 4'33.18"N 117°12'39.86"W
Job Description	15 minute noise measutement (1 x 15 minutes)		
Note	Ganddini Project 19518 ,27195 Almond Ave Warehouse, Redlands.		
Start Time	2022-06-06 16:26:53	Duration	0:15:00.0
End Time	2022-06-06 16:41:53	Run Time	0:15:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	50.3 dB		
LAE	79.8 dB	SEA	--- dB
EA	10.6 µPa²h	LAFTM5	52.8 dB
EA8	339.4 µPa²h		
EA40	1.7 mPa²h		
LA_{peak}	79.1 dB	2022-06-06 16:29:01	
LAS_{max}	62.0 dB	2022-06-06 16:30:27	
LAS_{min}	45.4 dB	2022-06-06 16:29:13	
LA_{eq}	50.3 dB		
LC_{eq}	66.0 dB	LC_{eq} - LA_{eq}	15.7 dB
LAI_{eq}	51.5 dB	LAI_{eq} - LA_{eq}	1.3 dB

Exceedances	Count	Duration
LAS > 65.0 dB	0	0:00:00.0
LAS > 85.0 dB	0	0:00:00.0
LApeak > 135.0 dB	0	0:00:00.0
LApeak > 137.0 dB	0	0:00:00.0
LApeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight
	--- dB	--- dB	0.0 dB

	LDEN	LDay	LEve	LNight
	--- dB	--- dB	--- dB	--- dB

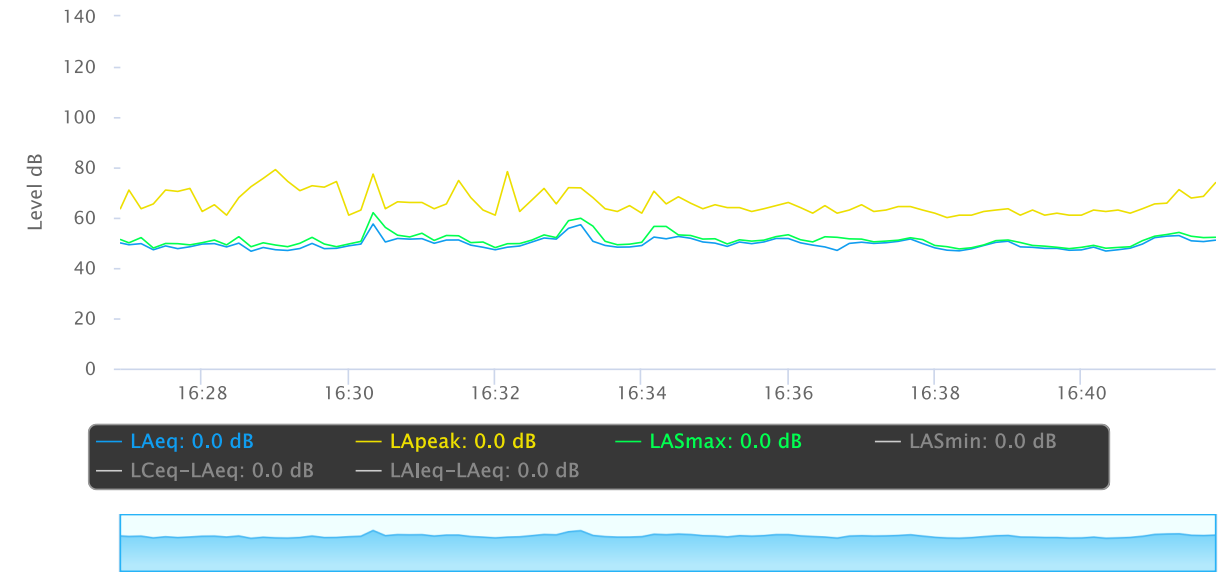
Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	50.3 dB		66.0 dB		--- dB	
$Ls_{(max)}$	62.0 dB	2022-06-06 16:30:27	--- dB		--- dB	
$LS_{(min)}$	45.4 dB	2022-06-06 16:29:13	--- dB		--- dB	
$L_{Peak(max)}$	79.1 dB	2022-06-06 16:29:01	--- dB		--- dB	

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

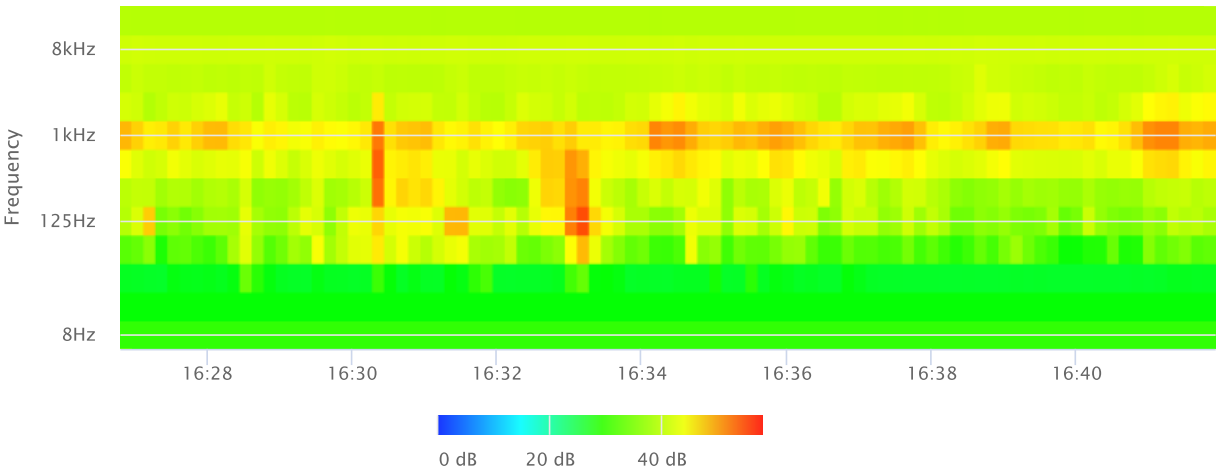
Statistics

LAS 2.0	56.0 dB
LAS 8.0	52.3 dB
LAS 25.0	50.8 dB
LAS 50.0	49.4 dB
LAS 66.6	48.4 dB
LAS 90.0	47.0 dB

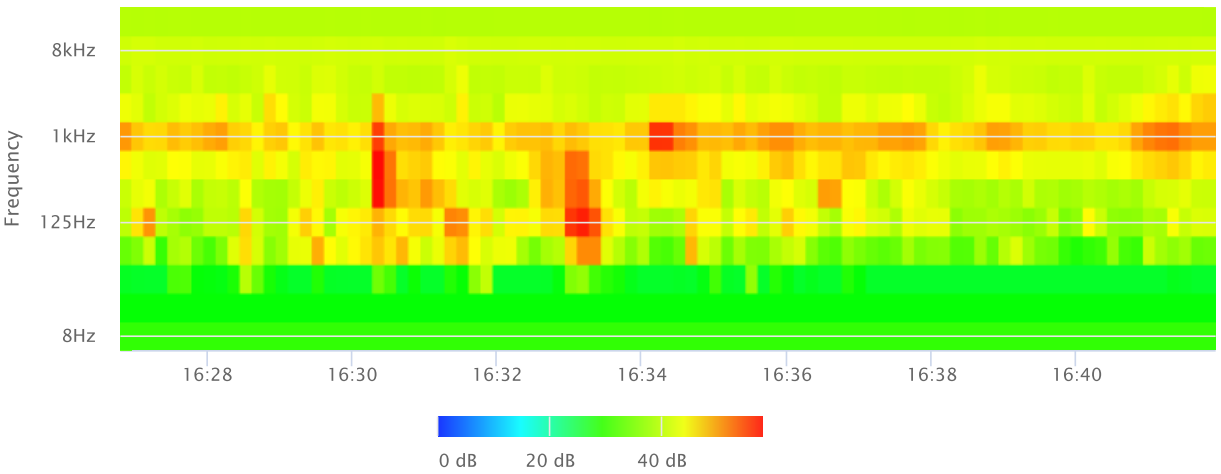
Time History



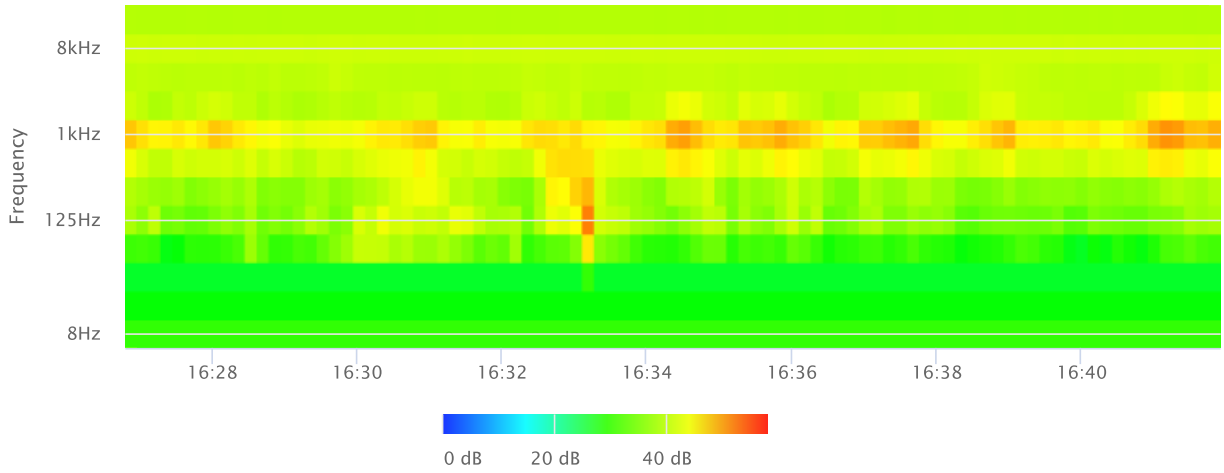
OBA 1/1 Leq



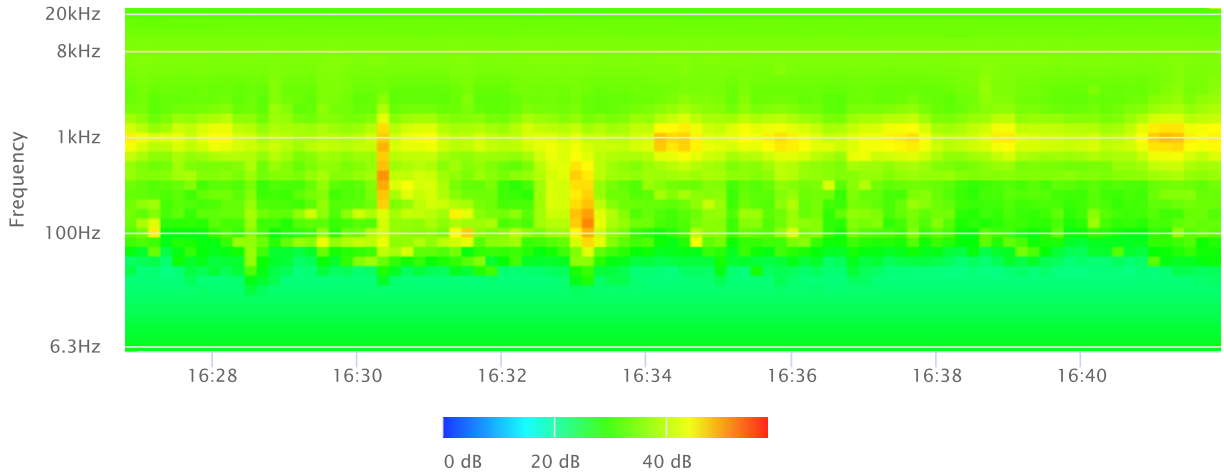
OBA 1/1 Lmax



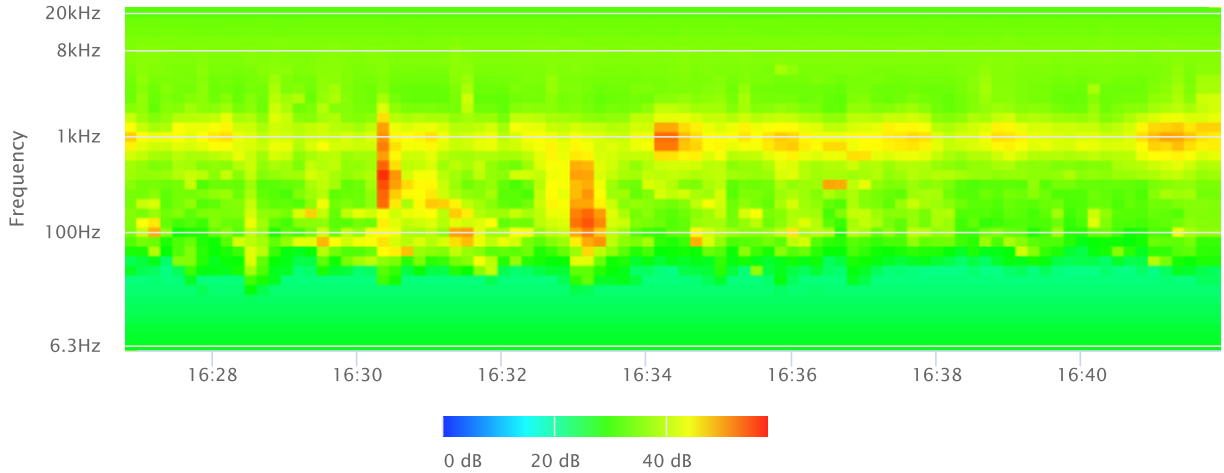
OBA 1/1 Lmin



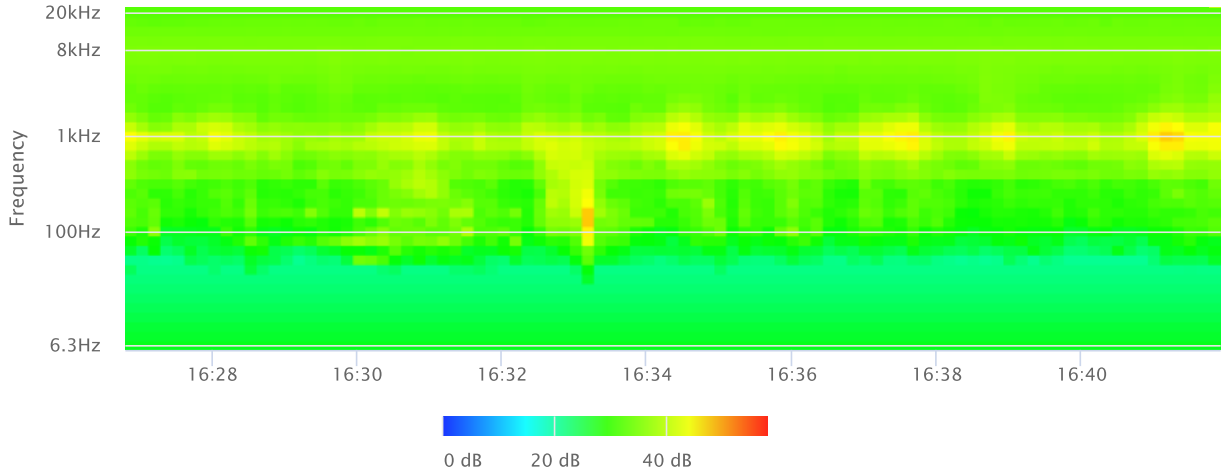
OBA 1/3 Leq



OBA 1/3 Lmax



OBA 1/3 Lmin


20kHz
8kHz
1kHz
100Hz
6.3Hz
Frequency
16:28
16:30
16:32
16:34
16:36
16:38
16:40
0 dB
20 dB
40 dB

Noise Measurement
Field Data

Project Name: 27195 Almond Avenue Warehouse, City of Redlands. **Date:** June 6 to 7, 2022

Project #: 19518

Noise Measurement #: LTNM1 Run Time: 24 hours (24 x 1 hours) **Technician:** Ian Edward Gallagher

Nearest Address or Cross Street: 27081 Almond Avenue, Redlands , CA 92374

Site Description (Type of Existing Land Use and any other notable features): Project Site: Orange trees w/ one residence, bordered by Almond Ave to north, commercial to east, commercial & multi-family residential to south, & industrial to west. Noise Measurement Site: Taken in SW corner of site, project site to north/east, multi-family residential to south, & industrial to west.

Weather: Clear skies, sunnrise/set: 5:37AM/ 7:58PM **Settings:** SLOW FAST

Temperature: 63 -92 deg F **Wind:** 0-10 mph **Humidity:** 38-50% **Terrain:** Flat

Start Time: 7:00 PM **End Time:** 7:00 PM **Run Time:**

Leq: 44.5 dB **Primary Noise Source:** Traffic ambiance from vehicles traveling along Almond Avenue, Alabama Street,

Lmax 75.7 dB Lugonia Avenue & Nevada Street. Traffic ambiance from other roads.

L2 51.4 dB **Secondary Noise Sources:** Leaf rustle from breeze. Bird song by day, crickets at night. Warehouse & storage

L8 46.6 dB yard ambiance. Occasional overhead air traffic.

L25 43.7 dB

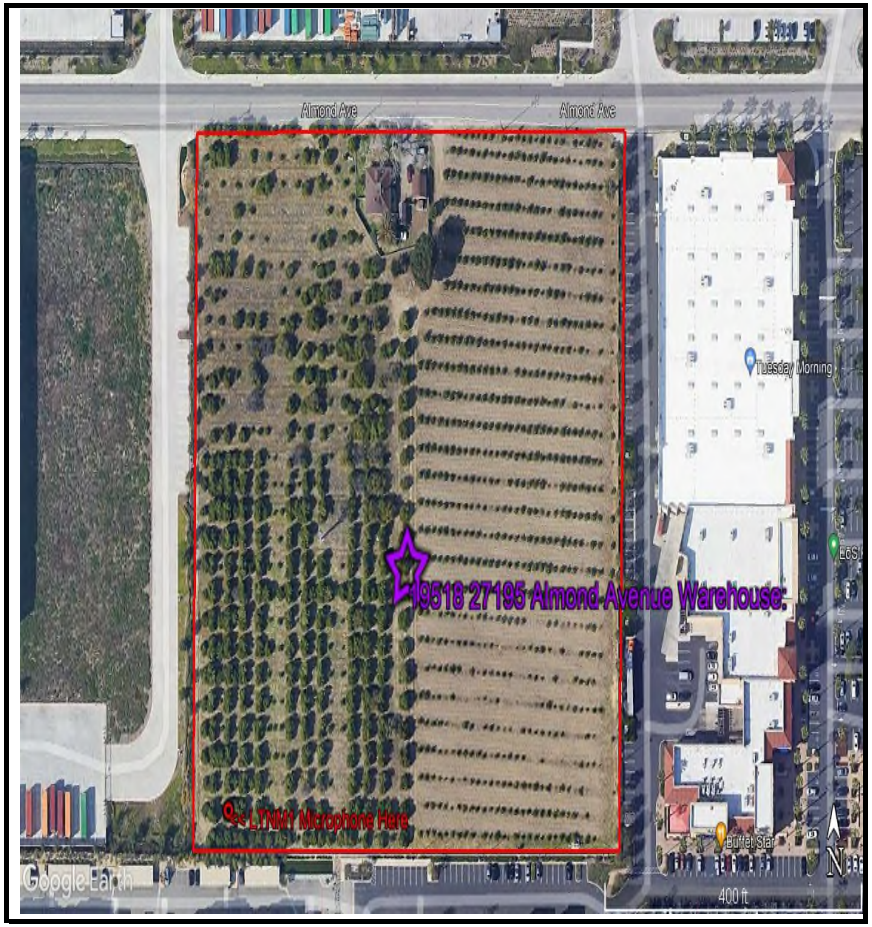
L50 41.7 dB

NOISE METER:	SoundTrack LXT Class 1	**CALIBRATOR:**	Larson Davis CA 250
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT1	**MODEL:**	CA 250
SERIAL NUMBER:	3099	**SERIAL NUMBER:**	2723
FACTORY CALIBRATION DATE:	11/17/2021	**FACTORY CALIBRATION DATE:**	11/18/2021
FIELD CALIBRATION DATE:	6/6/2022		

Noise Measurement
Field Data

PHOTOS:

LTNM1 looking S towards microphone located in orange tree. Microphone ~6.5 feet above ground.



Aerial view showing location of LTNM1 in relation to surrounding area.

Summary	
File Name on Meter	LxT_Data.055.s
File Name on PC	LxT_0003099-20220606 190000-LxT_Data.055.ldbin
Serial Number	0003099
Model	SoundTrack LxT®
Firmware Version	2.404
User	Ian Edward Gallagher
Location	LTNM1 34° 4'20.09"N 117°12'46.53"W
Job Description	24 hour noise measurement (24 x 1 hours)
Note	Ganddini Project 19518 ,27195 Almond Ave Warehouse, Redlands.

Measurement	
Start	2022-06-06 19:00:00
Stop	2022-06-07 19:00:00
Duration	24:00:00.0
Run Time	24:00:00.0
Pause	00:00:00.0
Pre-Calibration	2022-06-06 18:03:44
Post-Calibration	None

Overall Settings	
RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1L
Microphone Correction	Off
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	Bin Max

Results				
LAeq	44.5			
LAE	93.9			
EA	272.770	µPa²h		
EA8	90.923	µPa²h		
EA40	454.616	µPa²h		
LApeak (max)	2022-06-07 07:46:34	97.1	dB	
LASmax	2022-06-07 07:46:34	75.7	dB	
LASmin	2022-06-07 02:27:58	33.2	dB	

			Statistics	
LCeq	58.5	dB	**LA2.00**	51.4 dB
LAeq	44.5	dB	**LA8.00**	46.6 dB
LCeq - LAeq	13.9	dB	**LA25.00**	43.7 dB
LAIeq	47.6	dB	**LA50.00**	41.7 dB
LAeq	44.5	dB	**LA90.00**	38.8 dB
LAIeq - LAeq	3.0	dB	**LA99.00**	36.5 dB
Overload Count	0			

Record #	Date	Time	Run Duration	Run Time	Pause	LAeq	LASmin	LASmin Time	LASmax	LASmax Time	LAS2.00	LAS8.00	LAS25.00	LAS50.00	LAS90.00	LAS99.00
1	2022-06-06	19:00:00	01:00:00.0	01:00:00.0	00:00:00.0	48.1	41.1	19:58:11	65.3	19:20:13	55.4	50.3	46.9	45.5	43.7	42.2
2	2022-06-06	20:00:00	01:00:00.0	01:00:00.0	00:00:00.0	45.5	38.9	20:58:56	60.4	20:02:14	53.1	47.9	44.6	42.9	41.0	39.8
3	2022-06-06	21:00:00	01:00:00.0	01:00:00.0	00:00:00.0	43.8	37.5	21:19:09	60.3	21:26:00	50.8	46.0	43.3	41.5	39.4	38.6
4	2022-06-06	22:00:00	01:00:00.0	01:00:00.0	00:00:00.0	43.3	37.4	22:57:46	59.6	22:32:34	50.1	45.8	42.5	40.9	39.4	38.3
5	2022-06-06	23:00:00	01:00:00.0	01:00:00.0	00:00:00.0	41.5	36.8	23:53:59	53.9	23:10:45	47.4	43.5	41.5	40.5	38.9	38.0
6	2022-06-07	00:00:00	01:00:00.0	01:00:00.0	00:00:00.0	42.5	35.7	00:34:57	58.2	00:41:07	49.4	43.7	41.6	40.6	38.8	37.6
7	2022-06-07	01:00:00	01:00:00.0	01:00:00.0	00:00:00.0	39.9	34.0	01:57:26	49.2	01:59:57	44.7	41.8	40.8	39.6	36.3	35.3
8	2022-06-07	02:00:00	01:00:00.0	01:00:00.0	00:00:00.0	45.3	33.2	02:27:58	68.7	02:01:21	46.5	42.7	42.1	41.2	38.8	34.4
9	2022-06-07	03:00:00	01:00:00.0	01:00:00.0	00:00:00.0	40.1	34.2	03:23:29	51.5	03:44:06	43.3	42.0	40.7	39.6	37.7	35.7
10	2022-06-07	04:00:00	01:00:00.0	01:00:00.0	00:00:00.0	42.1	36.7	04:11:01	53.7	04:26:13	46.2	44.3	42.4	41.5	39.4	37.8
11	2022-06-07	05:00:00	01:00:00.0	01:00:00.0	00:00:00.0	43.3	37.0	05:59:59	52.5	05:37:47	48.8	45.6	43.9	42.4	39.9	38.5
12	2022-06-07	06:00:00	01:00:00.0	01:00:00.0	00:00:00.0	43.4	36.4	06:22:35	55.0	06:16:50	50.6	47.0	43.3	41.5	38.7	37.3
13	2022-06-07	07:00:00	01:00:00.0	01:00:00.0	00:00:00.0	47.2	37.3	07:30:38	75.7	07:46:34	53.2	47.5	44.2	42.0	39.2	37.9
14	2022-06-07	08:00:00	01:00:00.0	01:00:00.0	00:00:00.0	45.4	37.4	08:07:16	66.0	08:42:02	52.5	47.8	44.8	42.5	39.9	38.3
15	2022-06-07	09:00:00	01:00:00.0	01:00:00.0	00:00:00.0	42.5	35.9	09:51:37	62.3	09:06:00	49.0	45.2	42.0	39.8	37.5	36.5
16	2022-06-07	10:00:00	01:00:00.0	01:00:00.0	00:00:00.0	45.7	36.3	10:01:26	64.1	10:35:58	53.8	48.8	44.0	41.3	38.4	36.9
17	2022-06-07	11:00:00	01:00:00.0	01:00:00.0	00:00:00.0	47.5	35.7	11:34:37	60.5	11:08:26	57.0	53.1	45.8	41.2	37.7	36.5
18	2022-06-07	12:00:00	01:00:00.0	01:00:00.0	00:00:00.0	41.4	35.9	12:21:03	57.0	12:13:43	47.7	44.3	41.2	39.5	37.6	36.5
19	2022-06-07	13:00:00	01:00:00.0	01:00:00.0	00:00:00.0	43.0	37.7	13:59:58	66.1	13:49:25	48.0	45.2	42.9	41.4	39.5	38.5
20	2022-06-07	14:00:00	01:00:00.0	01:00:00.0	00:00:00.0	43.4	37.0	14:31:16	62.1	14:43:00	49.9	46.6	43.3	41.3	38.9	37.7
21	2022-06-07	15:00:00	01:00:00.0	01:00:00.0	00:00:00.0	43.6	39.1	15:16:43	64.0	15:14:25	47.7	45.6	43.7	42.7	41.2	40.1
22	2022-06-07	16:00:00	01:00:00.0	01:00:00.0	00:00:00.0	44.4	39.9	16:40:30	56.9	16:19:55	49.4	46.1	44.4	43.4	41.7	40.7
23	2022-06-07	17:00:00	01:00:00.0	01:00:00.0	00:00:00.0	46.6	39.6	17:15:15	64.2	17:43:17	54.1	47.9	45.0	43.8	42.0	41.0
24	2022-06-07	18:00:00	01:00:00.0	01:00:00.0	00:00:00.0	46.3	39.6	18:21:15	65.0	18:11:46	53.0	48.4	45.1	43.5	41.6	40.4

Measurement Report

Report Summary

Meter's File Name	LxT_Data.055.s	Computer's File Name	LxT_0003099-20220606 190000-LxT_Data.055.ldbin
Meter	LxT1 0003099		
Firmware	2.404		
User	Ian Edward Gallagher	Location	LTNM1 34° 4'20.09"N 117°12'46.53"W
Job Description	24 hour noise measurement (24 x 1 hours)		
Note	Ganddini Project 19518 ,27195 Almond Ave Warehouse, Redlands.		
Start Time	2022-06-06 19:00:00	Duration	24:00:00.0
End Time	2022-06-07 19:00:00	Run Time	24:00:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	44.5 dB		
LAE	93.9 dB	SEA	--- dB
EA	272.8 µPa²h	LAFTM5	49.3 dB
EA8	90.9 µPa²h		
EA40	454.6 µPa²h		
LA_{peak}	97.1 dB	2022-06-07 07:46:34	
LAS_{max}	75.7 dB	2022-06-07 07:46:34	
LAS_{min}	33.2 dB	2022-06-07 02:27:58	
LA_{eq}	44.5 dB		
LC_{eq}	58.5 dB	LC_{eq} - LA_{eq}	13.9 dB
LAI_{eq}	47.6 dB	LAI_{eq} - LA_{eq}	3.0 dB

Exceedances	Count	Duration
LAS > 65.0 dB	6	0:00:26.4
LAS > 85.0 dB	0	0:00:00.0
LApeak > 135.0 dB	0	0:00:00.0
LApeak > 137.0 dB	0	0:00:00.0
LApeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight
	--- dB	--- dB	0.0 dB

	LDEN	LDay	LEve	LNight
	--- dB	--- dB	--- dB	--- dB

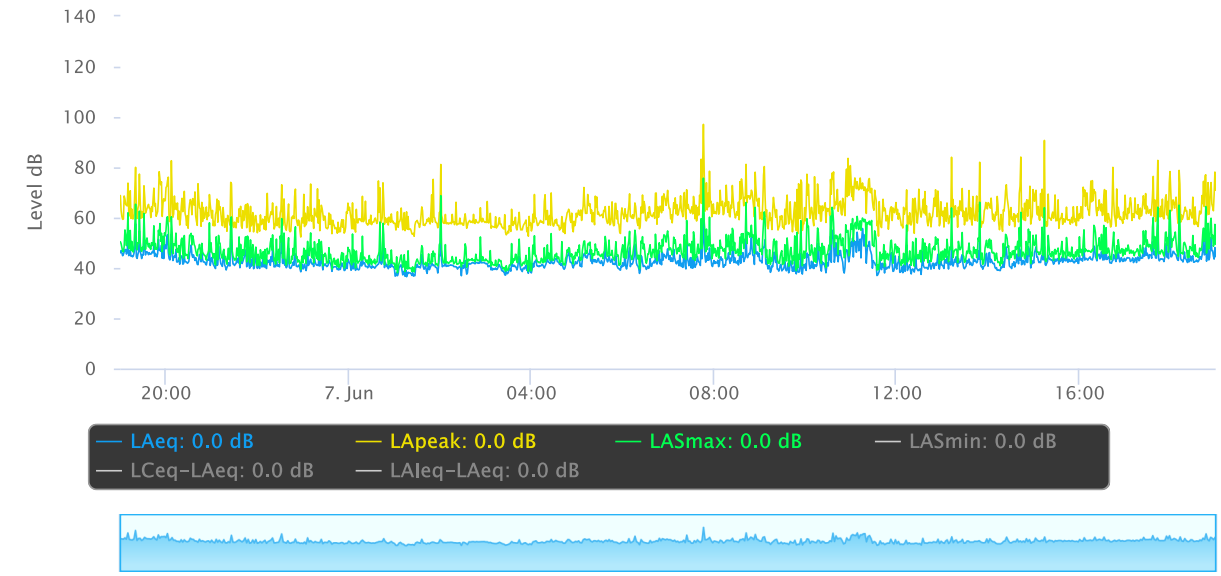
Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	44.5 dB		58.5 dB		--- dB	
$L_{S(max)}$	75.7 dB	2022-06-07 07:46:34	--- dB		--- dB	
$L_{S(min)}$	33.2 dB	2022-06-07 02:27:58	--- dB		--- dB	
$L_{Peak(max)}$	97.1 dB	2022-06-07 07:46:34	--- dB		--- dB	

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

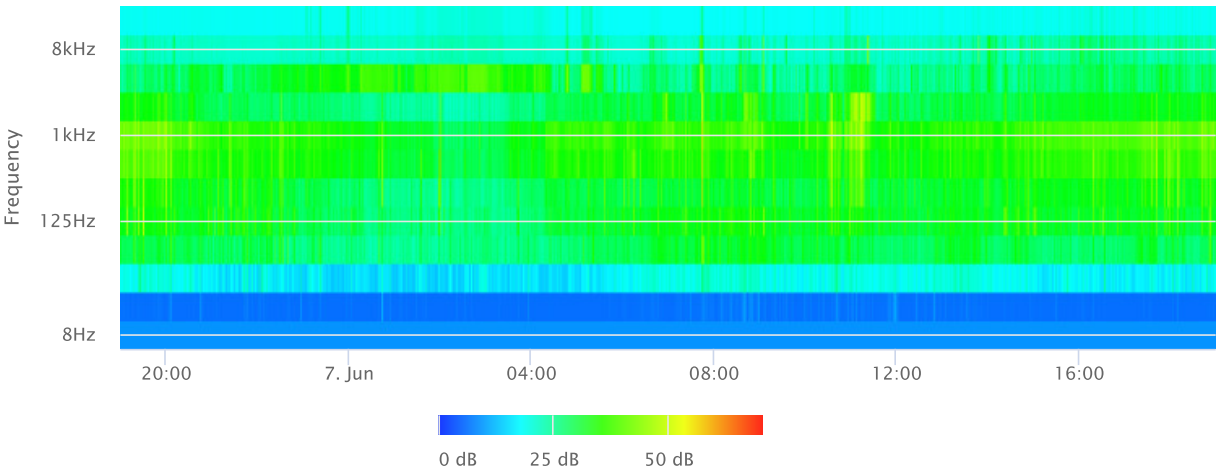
Statistics

LAS 2.0	51.4 dB
LAS 8.0	46.6 dB
LAS 25.0	43.7 dB
LAS 50.0	41.7 dB
LAS 90.0	38.8 dB
LAS 99.0	36.5 dB

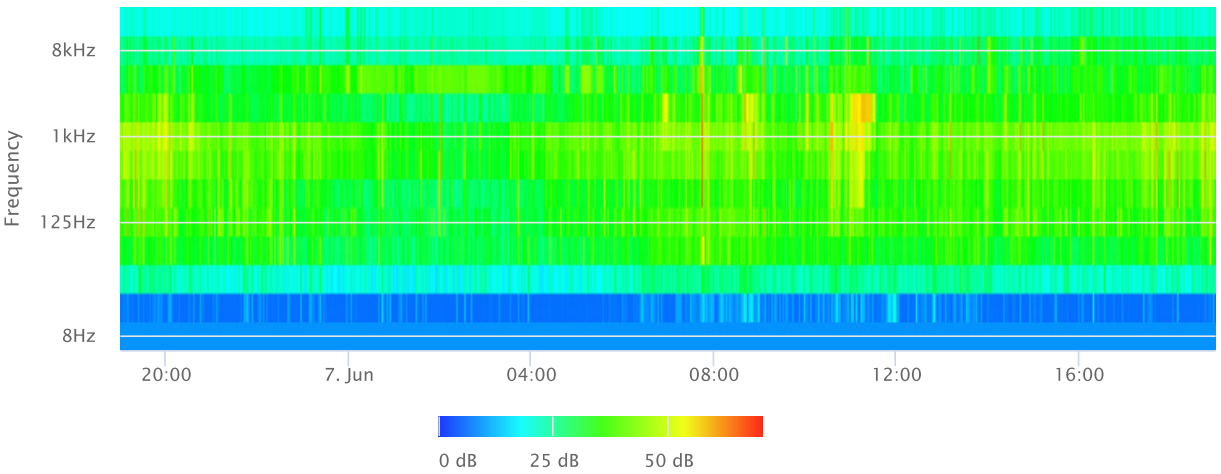
Time History



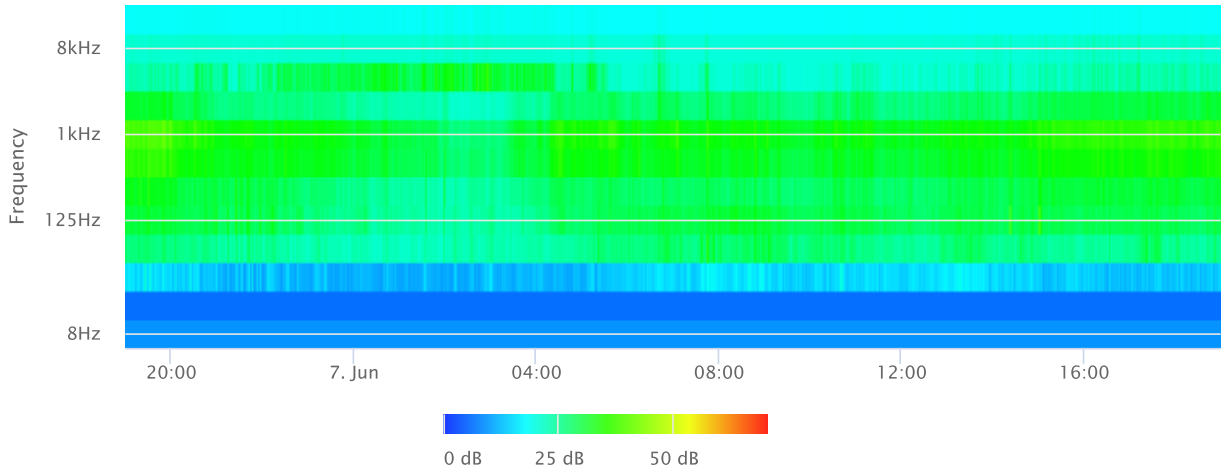
OBA 1/1 Leq



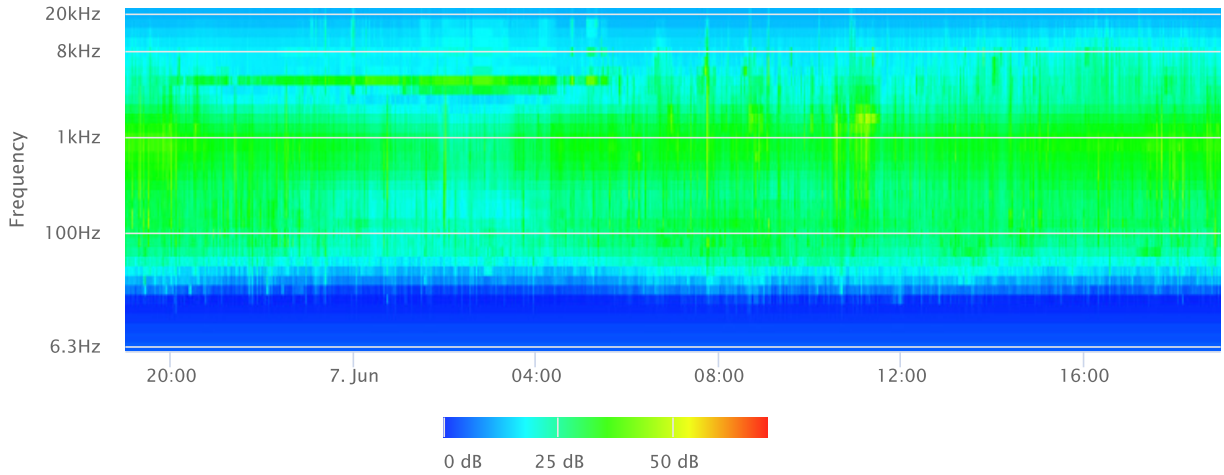
OBA 1/1 Lmax



OBA 1/1 Lmin



OBA 1/3 Leq



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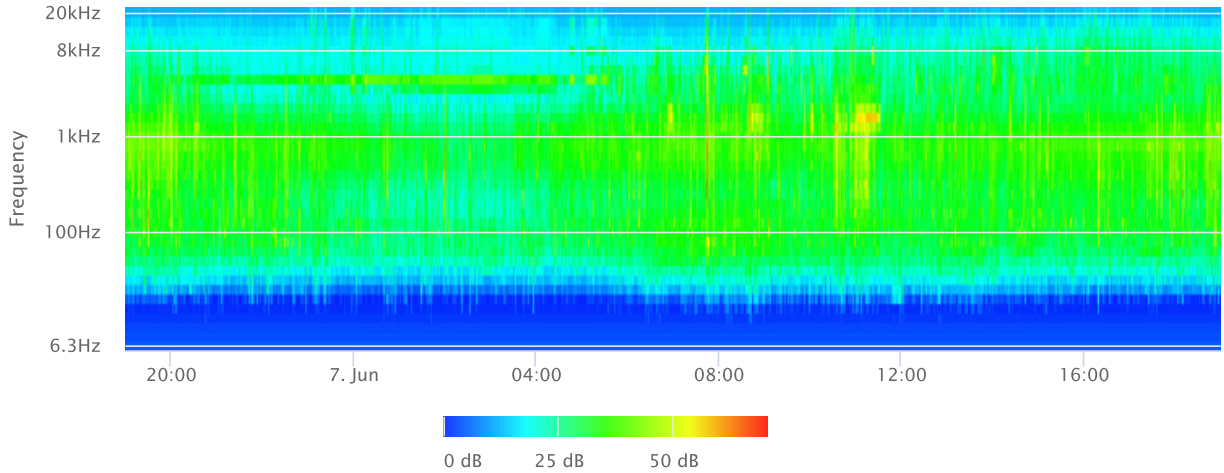
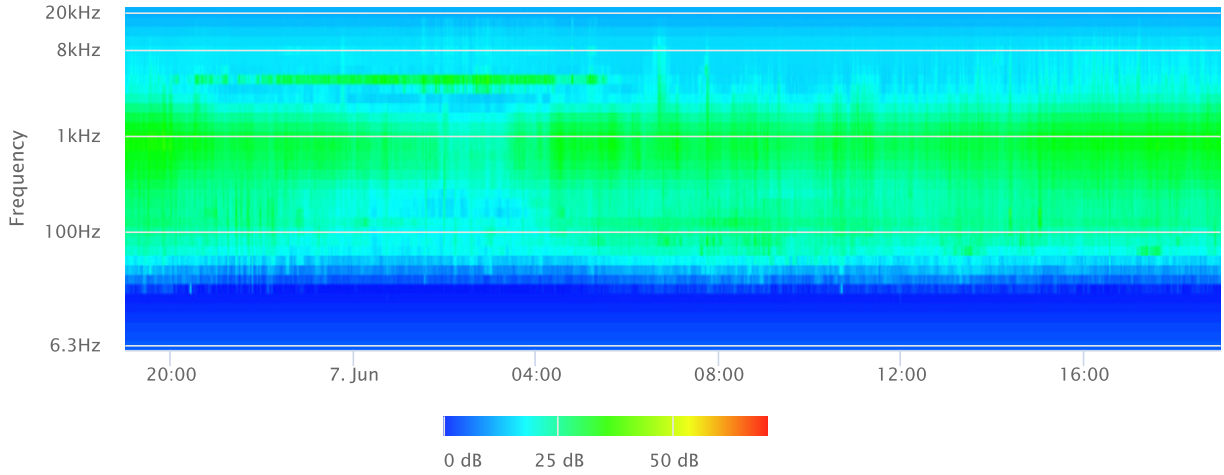


OBA 1/3 Lmin


20kHz
8kHz
1kHz
100Hz
6.3Hz
Frequency
20:00
7. Jun
04:00
08:00
12:00
16:00
0 dB
25 dB
50 dB

APPENDIX D

CONSTRUCTION NOISE MODELING

Receptor - Multi-family Residential Uses to the South (Circa 2020 Redlands Apartments, 27000 W Lugonia Ave, Redlands)

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[3]	Item Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Receptor Item Lmax, dBA	Receptor Item Leq, dBA
Demolition									
Excavator	3	81	589	40	1.20	-21.4	0.8	59.6	60.4
Rubber Tired Dozers	2	82	589	40	0.80	-21.4	-1.0	60.6	59.6
Concrete/Industrial Saws	1	90	589	20	0.20	-21.4	-7.0	68.6	61.6
								Log Sum	65.4
Site Preparation									
Rubber Tired Dozers	3	82	338	40	1.20	-16.6	0.8	65.4	66.2
Tractors/Loaders/Backhoes	4	84	338	40	1.60	-16.6	2.0	67.4	69.4
								Log Sum	71.1
Grading									
Excavator	1	81	338	40	0.40	-16.6	-4.0	64.4	60.4
Rubber Tired Dozers	1	82	338	40	0.40	-16.6	-4.0	65.4	61.4
Tractors/Loaders/Backhoes	3	84	338	40	1.20	-16.6	0.8	67.4	68.2
Graders	1	85	338	40	0.40	-16.6	-4.0	68.4	64.4
								Log Sum	70.7
Building Construction									
Cranes	1	81	338	16	0.16	-16.6	-8.0	64.4	56.4
Forklifts[2]	3	48	338	40	1.20	-16.6	0.8	31.4	32.2
Generator Sets	1	81	338	50	0.50	-16.6	-3.0	64.4	61.4
Welders	1	74	338	40	0.40	-16.6	-4.0	57.4	53.4
Tractors/Loaders/Backhoes	3	84	338	40	1.20	-16.6	0.8	67.4	68.2
								Log Sum	69.4
Paving									
Pavers	2	77	338	50	1.00	-16.6	0.0	60.4	60.4
Paving Equipment	2	77	338	50	1.00	-16.6	0.0	60.4	60.4
Rollers	2	80	338	20	0.40	-16.6	-4.0	63.4	59.4
								Log Sum	64.9
Architectural Coating									
Air Compressors	1	78	338	40	0.40	-16.6	-4.0	61.4	57.4
								Log Sum	57.4

Notes:

(1) Source: Referenced noise levels from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (September 2018) and the FHWA Roadway Construciton Noise Model User's Guide (January 2006)

(2) Source: SoundPLAN reference list.

(3) Distance to receptor calculated from center of site. Construction noise projected from the center of the project site to nearest sensitive use (property line).

Receptor - Church Use to the Northeast (Packinghouse Christian Church, 27165 San Bernardino Ave, Redlands)

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[3]	Item Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Receptor Item Lmax, dBA	Receptor Item Leq, dBA
Demolition									
Excavator	3	81	740	40	1.20	-23.4	0.8	57.6	58.4
Rubber Tired Dozers	2	82	740	40	0.80	-23.4	-1.0	58.6	57.6
Concrete/Industrial Saws	1	90	740	20	0.20	-23.4	-7.0	66.6	59.6
								Log Sum	63.4
Site Preparation									
Rubber Tired Dozers	3	82	1004	40	1.20	-26.1	0.8	55.9	56.7
Tractors/Loaders/Backhoes	4	84	1004	40	1.60	-26.1	2.0	57.9	60.0
								Log Sum	61.7
Grading									
Excavator	1	81	1004	40	0.40	-26.1	-4.0	54.9	51.0
Rubber Tired Dozers	1	82	1004	40	0.40	-26.1	-4.0	55.9	52.0
Tractors/Loaders/Backhoes	3	84	1004	40	1.20	-26.1	0.8	57.9	58.7
Graders	1	85	1004	40	0.40	-26.1	-4.0	58.9	55.0
								Log Sum	61.3
Building Construction									
Cranes	1	81	1004	16	0.16	-26.1	-8.0	54.9	47.0
Forklifts[2]	3	48	1004	40	1.20	-26.1	0.8	21.9	22.7
Generator Sets	1	81	1004	50	0.50	-26.1	-3.0	54.9	51.9
Welders	1	74	1004	40	0.40	-26.1	-4.0	47.9	44.0
Tractors/Loaders/Backhoes	3	84	1004	40	1.20	-26.1	0.8	57.9	58.7
								Log Sum	59.9
Paving									
Pavers	2	77	1004	50	1.00	-26.1	0.0	50.9	50.9
Paving Equipment	2	77	1004	50	1.00	-26.1	0.0	50.9	50.9
Rollers	2	80	1004	20	0.40	-26.1	-4.0	53.9	50.0
								Log Sum	55.4
Architectural Coating									
Air Compressors	1	78	1004	40	0.40	-26.1	-4.0	51.9	48.0
								Log Sum	48.0

Notes:

(1) Source: Referenced noise levels from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (September 2018) and the FHWA Roadway Construciton Noise Model User's Guide (January 2006)

(2) Source: SoundPLAN reference list.

(3) Distance to receptor calculated from center of site. Construction noise projected from the center of the project site to nearest sensitive use (property line).

Receptor - Multi-family Residential Uses the to Northeast (The Summit Apartments, 27431 San Bernardino Avenue, Redlands)

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Distance to Receptor[3]	Item Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Receptor Item Lmax, dBA	Receptor Item Leq, dBA
Demolition									
Excavator	3	81	1217	40	1.20	-27.7	0.8	53.3	54.1
Rubber Tired Dozers	2	82	1217	40	0.80	-27.7	-1.0	54.3	53.3
Concrete/Industrial Saws	1	90	1217	20	0.20	-27.7	-7.0	62.3	55.3
								Log Sum	59.1
Site Preparation									
Rubber Tired Dozers	3	82	1282	40	1.20	-28.2	0.8	53.8	54.6
Tractors/Loaders/Backhoes	4	84	1282	40	1.60	-28.2	2.0	55.8	57.9
								Log Sum	59.5
Grading									
Excavator	1	81	1282	40	0.40	-28.2	-4.0	52.8	48.8
Rubber Tired Dozers	1	82	1282	40	0.40	-28.2	-4.0	53.8	49.8
Tractors/Loaders/Backhoes	3	84	1282	40	1.20	-28.2	0.8	55.8	56.6
Graders	1	85	1282	40	0.40	-28.2	-4.0	56.8	52.8
								Log Sum	59.2
Building Construction									
Cranes	1	81	1282	16	0.16	-28.2	-8.0	52.8	44.9
Forklifts[2]	3	48	1282	40	1.20	-28.2	0.8	19.8	20.6
Generator Sets	1	81	1282	50	0.50	-28.2	-3.0	52.8	49.8
Welders	1	74	1282	40	0.40	-28.2	-4.0	45.8	41.8
Tractors/Loaders/Backhoes	3	84	1282	40	1.20	-28.2	0.8	55.8	56.6
								Log Sum	57.8
Paving									
Pavers	2	77	1282	50	1.00	-28.2	0.0	48.8	48.8
Paving Equipment	2	77	1282	50	1.00	-28.2	0.0	48.8	48.8
Rollers	2	80	1282	20	0.40	-28.2	-4.0	51.8	47.8
								Log Sum	53.3
Architectural Coating									
Air Compressors	1	78	1282	40	0.40	-28.2	-4.0	49.8	45.8
								Log Sum	45.8

Notes:

(1) Source: Referenced noise levels from the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment Manual (September 2018) and the FHWA Roadway Construciton Noise Model User's Guide (January 2006)

(2) Source: SoundPLAN reference list.

(3) Distance to receptor calculated from center of site. Construction noise projected from the center of the project site to nearest sensitive use (property line).

APPENDIX E

PROJECT GENERATED TRIPS FHWA WORKSHEETS

FHWA Traffic Noise Prediction Model FHWA-RD-77-108

Existing Traffic Noise

Project: **19518 27195 Almond Avenue Warehouse**

Road: **Alabama Avenue**

Segment: **North of Almond Avenue**

	DAYTIME			EVENING			NIGHTTIME			ADT	11873.00
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	45.00
										DISTANCE	60.00
INPUT PARAMETERS											
Vehicles per hour	687.64	14.25	23.75	510.54	2.37	3.96	126.65	19.79	32.98	% A	92
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00		
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00		
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	3
NOISE CALCULATIONS											
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14	% HT	5
ADJUSTMENTS											
Flow	21.54	4.70	6.92	20.24	-3.08	-0.86	14.19	6.13	8.34		
Distance	-0.86	-0.86	-0.86	-0.86	-0.86	-0.86	-0.86	-0.86	-0.86	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	72.86
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	67.56
LEQ	65.02	56.46	63.20	63.73	48.68	55.42	57.67	57.89	64.62	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	67.56		EVENING LEQ	64.44		NIGHT LEQ	66.13		Use hour?	no
										GRADE dB	0.00
		CNEL	**72.86**								

FHWA Traffic Noise Prediction Model FHWA-RD-77-108

Existing Plus Project Traffic Noise

Project: **19518 27195 Almond Avenue Warehouse**

Road: **Alabama Avenue**

Segment: **North of Almond Avenue**

	DAYTIME			EVENING			NIGHTTIME			ADT	11985.99
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	45.00
										DISTANCE	60.00
INPUT PARAMETERS											
Vehicles per hour	693.85	14.46	24.11	515.15	2.41	4.02	127.79	20.09	33.48	% A	91.96
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00		
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00		
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	3.02
NOISE CALCULATIONS											
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14	% HT	5.03
ADJUSTMENTS											
Flow	21.57	4.76	6.98	20.28	-3.02	-0.80	14.23	6.19	8.41		
Distance	-0.86	-0.86	-0.86	-0.86	-0.86	-0.86	-0.86	-0.86	-0.86	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	72.92
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	67.61
LEQ	65.06	56.53	63.26	63.76	48.74	55.48	57.71	57.95	64.69	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	67.61		EVENING LEQ	64.48		NIGHT LEQ	66.19		Use hour?	no
										GRADE dB	0.00
		CNEL	**72.92**								

FHWA Traffic Noise Prediction Model FHWA-RD-77-108

Existing Traffic Noise

Project: **19518 27195 Almond Avenue Warehouse**

Road: **Alabama Avenue**

Segment: **North of Almond Avenue**

	DAYTIME			EVENING			NIGHTTIME			ADT	11873.00
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	45.00
										DISTANCE	60.00
INPUT PARAMETERS											
Vehicles per hour	687.64	14.25	23.75	510.54	2.37	3.96	126.65	19.79	32.98	% A	92
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00		
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00		
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	3
NOISE CALCULATIONS											
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14	% HT	5
ADJUSTMENTS											
Flow	21.54	4.70	6.92	20.24	-3.08	-0.86	14.19	6.13	8.34		
Distance	-0.86	-0.86	-0.86	-0.86	-0.86	-0.86	-0.86	-0.86	-0.86	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	72.86
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	67.56
LEQ	65.02	56.46	63.20	63.73	48.68	55.42	57.67	57.89	64.62	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	67.56		EVENING LEQ	64.44		NIGHT LEQ	66.13		Use hour?	no
										GRADE dB	0.00
		CNEL	**72.86**								

FHWA Traffic Noise Prediction Model FHWA-RD-77-108

Existing Plus Project Traffic Noise

Project: **19518 27195 Almond Avenue Warehouse**

Road: **Alabama Avenue**

Segment: **North of Almond Avenue**

	DAYTIME			EVENING			NIGHTTIME			ADT	12117.99
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	45.00
										DISTANCE	60.00
INPUT PARAMETERS											
Vehicles per hour	701.10	14.72	24.53	520.53	2.45	4.09	129.12	20.44	34.06	% A	91.90
Speed in MPH	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00		
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00		
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	3.04
NOISE CALCULATIONS											
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14	% HT	5.06
ADJUSTMENTS											
Flow	21.62	4.84	7.06	20.33	-2.94	-0.72	14.27	6.27	8.48		
Distance	-0.86	-0.86	-0.86	-0.86	-0.86	-0.86	-0.86	-0.86	-0.86	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	72.99
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	67.67
LEQ	65.10	56.60	63.34	63.81	48.82	55.56	57.75	58.03	64.76	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	67.67		EVENING LEQ	64.53		NIGHT LEQ	66.26		Use hour?	no
										GRADE dB	0.00
		CNEL	**72.99**								

FHWA Traffic Noise Prediction Model FHWA-RD-77-108

Existing Traffic Noise

Project: **19518 27195 Almond Avenue Warehouse**

Road: **Almond Avenue**

Segment: **West of Project Site**

	DAYTIME			EVENING			NIGHTTIME			ADT	6480.00
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	40.00
										DISTANCE	30.00
INPUT PARAMETERS											
Vehicles per hour	397.42	4.86	1.89	293.70	0.86	0.86	73.56	6.48	2.52	% A	97.4
Speed in MPH	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00		
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00		
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	1.84
NOISE CALCULATIONS											
Reference levels	67.36	76.31	81.16	67.36	76.31	81.16	67.36	76.31	81.16	% HT	0.74
ADJUSTMENTS											
Flow	19.67	0.54	-3.56	18.35	-6.97	-6.96	12.34	1.79	-2.31		
Distance	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	68.44
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	65.00
LEQ	64.17	54.00	54.75	62.86	46.49	51.35	56.85	55.25	56.00	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	65.00		EVENING LEQ	63.25		NIGHT LEQ	60.85		Use hour?	no
										GRADE dB	0.00
		CNEL	**68.44**								

FHWA Traffic Noise Prediction Model FHWA-RD-77-108

Existing Plus Project Traffic Noise

Project: **19518 27195 Almond Avenue Warehouse**

Road: **Almond Avenue**

Segment: **West of Project Site**

	DAYTIME			EVENING			NIGHTTIME			ADT	6499.00
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	40.00
										DISTANCE	30.00
INPUT PARAMETERS											
Vehicles per hour	398.46	4.90	1.95	294.47	0.87	0.89	73.76	6.53	2.60	% A	97.37
Speed in MPH	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00		
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00		
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	1.85
NOISE CALCULATIONS											
Reference levels	67.36	76.31	81.16	67.36	76.31	81.16	67.36	76.31	81.16	% HT	0.76
ADJUSTMENTS											
Flow	19.68	0.57	-3.43	18.36	-6.94	-6.82	12.35	1.82	-2.18		
Distance	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	68.48
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	65.03
LEQ	64.19	54.03	54.88	62.87	46.52	51.49	56.86	55.28	56.13	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	65.03		EVENING LEQ	63.27		NIGHT LEQ	60.91		Use hour?	no
										GRADE dB	0.00
		CNEL	**68.48**								

FHWA Traffic Noise Prediction Model FHWA-RD-77-108

Existing Traffic Noise

Project: **19518 27195 Almond Avenue Warehouse**

Road: **Almond Avenue**

Segment: **Project Site to Alabama Street**

	DAYTIME			EVENING			NIGHTTIME			ADT	6480.00
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	40.00
										DISTANCE	30.00
INPUT PARAMETERS											
Vehicles per hour	397.42	4.86	1.89	293.70	0.86	0.86	73.56	6.48	2.52	% A	97.4
Speed in MPH	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00		
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00		
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	1.84
NOISE CALCULATIONS											
Reference levels	67.36	76.31	81.16	67.36	76.31	81.16	67.36	76.31	81.16	% HT	0.74
ADJUSTMENTS											
Flow	19.67	0.54	-3.56	18.35	-6.97	-6.96	12.34	1.79	-2.31		
Distance	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	68.44
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	65.00
LEQ	64.17	54.00	54.75	62.86	46.49	51.35	56.85	55.25	56.00	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	65.00		EVENING LEQ	63.25		NIGHT LEQ	60.85		Use hour?	no
										GRADE dB	0.00
		CNEL	**68.44**								

FHWA Traffic Noise Prediction Model FHWA-RD-77-108

Existing Plus Project Traffic Noise

Project: **19518 27195 Almond Avenue Warehouse**

Road: **Almond Avenue**

Segment: **Project Site to Alabama Street**

	DAYTIME			EVENING			NIGHTTIME			ADT	6837.98
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	40.00
										DISTANCE	30.00
INPUT PARAMETERS											
Vehicles per hour	417.09	5.56	3.01	308.23	0.99	1.38	77.21	7.41	4.02	% A	96.87
Speed in MPH	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00		
Left angle	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00	-90.00		
Right angle	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	90.00	% MT	1.99
NOISE CALCULATIONS											
Reference levels	67.36	76.31	81.16	67.36	76.31	81.16	67.36	76.31	81.16	% HT	1.12
ADJUSTMENTS											
Flow	19.88	1.12	-1.54	18.56	-6.39	-4.93	12.55	2.37	-0.29		
Distance	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	LEFT	-90.00
Finite Roadway	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	RIGHT	90.00
Barrier	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	CNEL	69.23
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	65.45
LEQ	64.38	54.58	56.77	63.07	47.07	53.37	57.06	55.83	58.02	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	65.45		EVENING LEQ	63.61		NIGHT LEQ	61.83		Use hour?	no
										GRADE dB	0.00
		CNEL	**69.23**								

APPENDIX F

SOUNDPLAN INPUTS AND OUTPUTS

Receiver list

No.	Receiver name	Building side	Floor	Limit Day dB(A)	Level w/o NP Day dB(A)	Level w NP Day dB(A)	Difference Day dB	Conflict Day dB
1	2	-	EG	-	57.2	46.5	-10.7	-
2		-	EG	-	33.3	33.3	0.0	-
3	3	-	EG	-	46.5	46.5	0.0	-
4	4	-	EG	-	26.0	26.0	0.0	-
5	5	-	EG	-	55.0	44.2	-10.8	-
6	6	-	EG	-	55.0	43.8	-11.2	-

Noise emissions of industry sources

Source name	Reference	Level	Frequency spectrum [dB(A)]										Corrections		
		Day	31	63	125	250	500	1	2	4	8	16	Cwall	CI	CT
		dB(A)	Hz	Hz	Hz	Hz	Hz	kHz	kHz	kHz	kHz	kHz	dB	dB	dB
Loading/Unloading	Lw/m²	-	-	35.0	45.0	52.1	58.1	61.0	62.0	62.1	60.0	-	-	-	-
Truck Movement	Lw/m	-	-	49.6	53.6	57.6	60.6	63.6	61.6	56.6	51.6	-	-	-	-
HVAC1	Lw/unit	-	20.0	24.0	37.0	42.0	36.0	47.0	49.0	48.0	50.0	50.0	-	-	-
HVAC2	Lw/unit	-	20.0	24.0	37.0	42.0	36.0	47.0	49.0	48.0	50.0	50.0	-	-	-
HVAC3	Lw/unit	-	20.0	24.0	37.0	42.0	36.0	47.0	49.0	48.0	50.0	50.0	-	-	-
HVAC4	Lw/unit	-	20.0	24.0	37.0	42.0	36.0	47.0	49.0	48.0	50.0	50.0	-	-	-
HVAC5	Lw/unit	-	20.0	24.0	37.0	42.0	36.0	47.0	49.0	48.0	50.0	50.0	-	-	-
HVAC6	Lw/unit	-	20.0	24.0	37.0	42.0	36.0	47.0	49.0	48.0	50.0	50.0	-	-	-
HVAC7	Lw/unit	-	20.0	24.0	37.0	42.0	36.0	47.0	49.0	48.0	50.0	50.0	-	-	-
HVAC8	Lw/unit	-	20.0	24.0	37.0	42.0	36.0	47.0	49.0	48.0	50.0	50.0	-	-	-
HVAC9	Lw/unit	-	20.0	24.0	37.0	42.0	36.0	47.0	49.0	48.0	50.0	50.0	-	-	-
HVAC10	Lw/unit	-	20.0	24.0	37.0	42.0	36.0	47.0	49.0	48.0	50.0	50.0	-	-	-
HVAC11	Lw/unit	-	20.0	24.0	37.0	42.0	36.0	47.0	49.0	48.0	50.0	50.0	-	-	-
HVAC12	Lw/unit	-	20.0	24.0	37.0	42.0	36.0	47.0	49.0	48.0	50.0	50.0	-	-	-
HVAC13	Lw/unit	-	20.0	24.0	37.0	42.0	36.0	47.0	49.0	48.0	50.0	50.0	-	-	-
HVAC14	Lw/unit	-	20.0	24.0	37.0	42.0	36.0	47.0	49.0	48.0	50.0	50.0	-	-	-

Noise emissions of industry sources

Source name	Referen	Level	Frequency spectrum [dB(A)]																											Correctio		
			31	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1	1.3	1.6	2	2.5	3.2	4	5	6.3	8	10	12.5	16	Cwa	Cl	CT
		dB(A	Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz	kHz	kHz	kHz	kHz	kHz	kHz	kHz	kHz	kHz	kHz	kHz	kHz	kHz	dB	dB	dB
Loading/Unlo	Lw/m²	Da 68.0	-	-	-	35.	38.	42.	45.	47.	49.	52.	54.	56.	58.1	59.	60.	61.	61.	61.	62.	62.	62.	62.	61.	61.	60.	-	-	-	-	-	-
Truck Mover	Lw/m	Da 68.0	-	-	-	49.	53.	50.	53.	56.	55.	57.	59.	59.	60.6	61.	62.	63.	64.	61.	61.	61.	56.	56.	56.	52.	51.	-	-	-	-	-	-
HVAC1	Lw/unit	Da 56.2	20.	24.	20.	24.	27.	34.	37.	39.	39.	42.	44.	34.	36.0	37.	46.	47.	47.	48.	49.	49.	48.	48.	47.	51.	50.	48.	52.	50.	-	-	-
HVAC2	Lw/unit	Da 56.2	20.	24.	20.	24.	27.	34.	37.	39.	39.	42.	44.	34.	36.0	37.	46.	47.	47.	48.	49.	49.	48.	48.	47.	51.	50.	48.	52.	50.	-	-	-
HVAC3	Lw/unit	Da 56.2	20.	24.	20.	24.	27.	34.	37.	39.	39.	42.	44.	34.	36.0	37.	46.	47.	47.	48.	49.	49.	48.	48.	47.	51.	50.	48.	52.	50.	-	-	-
HVAC4	Lw/unit	Da 56.2	20.	24.	20.	24.	27.	34.	37.	39.	39.	42.	44.	34.	36.0	37.	46.	47.	47.	48.	49.	49.	48.	48.	47.	51.	50.	48.	52.	50.	-	-	-
HVAC5	Lw/unit	Da 56.2	20.	24.	20.	24.	27.	34.	37.	39.	39.	42.	44.	34.	36.0	37.	46.	47.	47.	48.	49.	49.	48.	48.	47.	51.	50.	48.	52.	50.	-	-	-
HVAC6	Lw/unit	Da 56.2	20.	24.	20.	24.	27.	34.	37.	39.	39.	42.	44.	34.	36.0	37.	46.	47.	47.	48.	49.	49.	48.	48.	47.	51.	50.	48.	52.	50.	-	-	-
HVAC7	Lw/unit	Da 56.2	20.	24.	20.	24.	27.	34.	37.	39.	39.	42.	44.	34.	36.0	37.	46.	47.	47.	48.	49.	49.	48.	48.	47.	51.	50.	48.	52.	50.	-	-	-
HVAC8	Lw/unit	Da 56.2	20.	24.	20.	24.	27.	34.	37.	39.	39.	42.	44.	34.	36.0	37.	46.	47.	47.	48.	49.	49.	48.	48.	47.	51.	50.	48.	52.	50.	-	-	-
HVAC9	Lw/unit	Da 56.2	20.	24.	20.	24.	27.	34.	37.	39.	39.	42.	44.	34.	36.0	37.	46.	47.	47.	48.	49.	49.	48.	48.	47.	51.	50.	48.	52.	50.	-	-	-
HVAC10	Lw/unit	Da 56.2	20.	24.	20.	24.	27.	34.	37.	39.	39.	42.	44.	34.	36.0	37.	46.	47.	47.	48.	49.	49.	48.	48.	47.	51.	50.	48.	52.	50.	-	-	-
HVAC11	Lw/unit	Da 56.2	20.	24.	20.	24.	27.	34.	37.	39.	39.	42.	44.	34.	36.0	37.	46.	47.	47.	48.	49.	49.	48.	48.	47.	51.	50.	48.	52.	50.	-	-	-
HVAC12	Lw/unit	Da 56.2	20.	24.	20.	24.	27.	34.	37.	39.	39.	42.	44.	34.	36.0	37.	46.	47.	47.	48.	49.	49.	48.	48.	47.	51.	50.	48.	52.	50.	-	-	-
HVAC13	Lw/unit	Da 56.2	20.	24.	20.	24.	27.	34.	37.	39.	39.	42.	44.	34.	36.0	37.	46.	47.	47.	48.	49.	49.	48.	48.	47.	51.	50.	48.	52.	50.	-	-	-
Air Brake	Lw/unit	Da 56.2	20.	24.	20.	24.	27.	34.	37.	39.	39.	42.	44.	34.	36.0	37.	46.	47.	47.	48.	49.	49.	48.	48.	47.	51.	50.	48.	52.	50.	-	-	-
	Lw/unit	Da 110.	-	-	-	-	-	-	-	-	-	-	-	-	110	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Noise emissions of parking lot traffic

Name	Parking bays	Movements Day	Corrections Parking lot type	dB(A)	Level Day dB(A)	Night dB(A)
Parking 1	28.0	0.100		10.0	51.5	0.0
Parking 2	144.0	0.200		0.0	51.6	0.0
3	0.0	0.000		10.0	0.0	0.0

Noise emissions of parking lot traffic

Name	Parking bays	Movements		Corrections		Level	
		Day	Lmax	Parking lot type	dB(A)	Day dB(A)	Night dB(A)
Parking 1	28.0	0.100	0.000	Truck and bus parking lots	10.0	51.5	0.0
Parking 2	144.0	0.200	0.000	Car parking lots	0.0	51.6	0.0
3	0.0	0.000	0.000	Own entry	10.0	0.0	0.0

Receiver list

No.	Receiver name	Building side	Floor	Limit Day dB(A)	Level w/o NP Day dB(A)	Level w NP Day dB(A)	Difference Day dB	Conflict Day dB
1	2	-	EG	-	57.2	60.0	2.8	-
2		-	EG	-	33.3	35.5	2.1	-
3	3	-	EG	-	46.5	46.6	0.1	-
4	4	-	EG	-	26.0	30.3	4.3	-
5	5	-	EG	-	55.0	63.0	8.0	-
6	6	-	EG	-	55.0	72.3	17.3	-

APPENDIX G

VIBRATION WORKSHEETS

GROUNDBORNE VIBRATION ANALYSIS			
Project:	19518 27195 Almond Avenue Warehouse Project		Date: 5/10/22
Source:	Vibratory Roller		
Scenario:	Unmitigated		
Location:	Residential to South		
Address:			
PPV = PPVref(25/D)^n (in/sec)			
INPUT			
Equipment Type	1	Vibratory Roller	INPUT SECTION IN GREEN
PPVref =	0.21	Reference PPV (in/sec) at 25 ft.	
D =	55.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	
Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.			
RESULTS			
PPV =	0.064	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS			
Project:	19518 27195 Almond Avenue Warehouse Project		Date: 5/10/22
Source:	Large Bulldozer		
Scenario:	Unmitigated		
Location:	Residential to South		
Address:			
PPV = PPVref(25/D)^n (in/sec)			
INPUT			
Equipment = Type	2	Large Bulldozer	INPUT SECTION IN GREEN
PPVref =	0.089	Reference PPV (in/sec) at 25 ft.	
D =	55.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	
Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.			
RESULTS			
PPV =	0.027	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS			
Project:	19518 27195 Almond Avenue Warehouse Project		Date: 5/10/22
Source:	Vibratory Roller		
Scenario:	Unmitigated		
Location:	Commercial to South		
Address:			
PPV = PPVref(25/D)^n (in/sec)			
INPUT			
Equipment = Type	1	Vibratory Roller	INPUT SECTION IN GREEN
PPVref =	0.21	Reference PPV (in/sec) at 25 ft.	
D =	58.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	
Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.			
RESULTS			
PPV =	0.059	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS			
Project:	19518 27195 Almond Avenue Warehouse Project		Date: 5/10/22
Source:	Large Bulldozer		
Scenario:	Unmitigated		
Location:	Commercial to South		
Address:			
PPV = PPVref(25/D)^n (in/sec)			
INPUT			
Equipment Type =	2	Large Bulldozer	INPUT SECTION IN GREEN
PPVref =	0.089	Reference PPV (in/sec) at 25 ft.	
D =	58.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	
Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.			
RESULTS			
PPV =	0.025	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS			
Project:	19518 27195 Almond Avenue Warehouse Project		Date: 5/10/22
Source:	Vibratory Roller		
Scenario:	Unmitigated		
Location:	Commercial to East		
Address:			
PPV = PPVref(25/D)^n (in/sec)			
INPUT			
Equipment = Type	1	Vibratory Roller	INPUT SECTION IN GREEN
PPVref =	0.21	Reference PPV (in/sec) at 25 ft.	
D =	62.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	
Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.			
RESULTS			
PPV =	0.054	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS			
Project:	19518 27195 Almond Avenue Warehouse Project		Date: 5/10/22
Source:	Large Bulldozer		
Scenario:	Unmitigated		
Location:	Commercial to East		
Address:			
PPV = PPVref(25/D)^n (in/sec)			
INPUT			
Equipment = Type	2	Large Bulldozer	INPUT SECTION IN GREEN
PPVref =	0.089	Reference PPV (in/sec) at 25 ft.	
D =	62.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	
Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.			
RESULTS			
PPV =	0.023	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS			
Project:	19518 27195 Almond Avenue Warehouse Project		Date: 5/10/22
Source:	Vibratory Roller		
Scenario:	Unmitigated		
Location:	Industrial to West		
Address:			
PPV = PPVref(25/D)^n (in/sec)			
INPUT			
Equipment = Type	1	Vibratory Roller	INPUT SECTION IN GREEN
PPVref =	0.21	Reference PPV (in/sec) at 25 ft.	
D =	291.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	
Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.			
RESULTS			
PPV =	0.005	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS			
Project:	19518 27195 Almond Avenue Warehouse Project		Date: 5/10/22
Source:	Large Bulldozer		
Scenario:	Unmitigated		
Location:	Industrial to West		
Address:			
PPV = PPVref(25/D)^n (in/sec)			
INPUT			
Equipment = Type	2	Large Bulldozer	INPUT SECTION IN GREEN
PPVref =	0.089	Reference PPV (in/sec) at 25 ft.	
D =	291.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	
Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.			
RESULTS			
PPV =	0.002	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS			
Project:	19518 27195 Almond Avenue Warehouse Project		Date: 5/10/22
Source:	Vibratory Roller		
Scenario:	Unmitigated		
Location:	Industrial to North		
Address:			
PPV = PPVref(25/D)^n (in/sec)			
INPUT			
Equipment = Type	1	Vibratory Roller	INPUT SECTION IN GREEN
PPVref =	0.21	Reference PPV (in/sec) at 25 ft.	
D =	198.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	
Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.			
RESULTS			
PPV =	0.009	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS			
Project:	19518 27195 Almond Avenue Warehouse Project		Date: 5/10/22
Source:	Large Bulldozer		
Scenario:	Unmitigated		
Location:	Industrial to North		
Address:			
PPV = PPVref(25/D)^n (in/sec)			
INPUT			
Equipment = Type	2	Large Bulldozer	INPUT SECTION IN GREEN
PPVref =	0.089	Reference PPV (in/sec) at 25 ft.	
D =	198.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	
Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.			
RESULTS			
PPV =	0.004	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS			
Project:	19518 27195 Almond Avenue Warehouse Project		Date: 5/10/22
Source:	Vibratory Roller		
Scenario:	Unmitigated		
Location:	Industrial to Northeast		
Address:			
PPV = PPVref(25/D)^n (in/sec)			
INPUT			
Equipment = Type	1	Vibratory Roller	INPUT SECTION IN GREEN
PPVref =	0.21	Reference PPV (in/sec) at 25 ft.	
D =	162.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	
Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.			
RESULTS			
PPV =	0.013	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS			
Project:	19518 27195 Almond Avenue Warehouse Project		Date: 5/10/22
Source:	Large Bulldozer		
Scenario:	Unmitigated		
Location:	Industrial to Northeast		
Address:			
PPV = PPVref(25/D)^n (in/sec)			
INPUT			
Equipment = Type	2	Large Bulldozer	INPUT SECTION IN GREEN
PPVref =	0.089	Reference PPV (in/sec) at 25 ft.	
D =	162.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	
Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.			
RESULTS			
PPV =	0.005	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS			
Project:	19518 27195 Almond Avenue Warehouse Project		Date: 5/10/22
Source:	Vibratory Roller		
Scenario:	Unmitigated		
Location:	Annoyance Threshold		
Address:			
PPV = PPVref(25/D)^n (in/sec)			
INPUT			
Equipment = Type	1	Vibratory Roller	INPUT SECTION IN GREEN
PPVref =	0.21	Reference PPV (in/sec) at 25 ft.	
D =	41.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	
Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.			
RESULTS			
PPV =	0.100	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS			
Project:	19518 27195 Almond Avenue Warehouse Project		Date: 5/10/22
Source:	Large Bulldozer		
Scenario:	Unmitigated		
Location:	Annoyance Threshold		
Address:			
PPV = PPVref(25/D)^n (in/sec)			
INPUT			
Equipment = Type	2	Large Bulldozer	INPUT SECTION IN GREEN
PPVref =	0.089	Reference PPV (in/sec) at 25 ft.	
D =	23.00	Distance from Equipment to Receiver (ft)	
n =	1.50	Vibration attenuation rate through the ground	
Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.			
RESULTS			
PPV =	0.101	IN/SEC	OUTPUT IN BLUE

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