Appendix H

Harley Knox Industrial Project Noise Impact Analysis

Ganddini Group

June 14, 2022

HARLEY KNOX INDUSTRIAL NOISE IMPACT ANALYSIS

City of Perris

June 14, 2022

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

HARLEY KNOX INDUSTRIAL NOISE IMPACT ANALYSIS

City of Perris

June 14, 2022

prepared by
Roma Stromberg, INCE, MS
Catherine Howe, MS

GANDDINI GROUP INC.
555 Park Center Drive, Suite 225
Santa Ana, California 92705
(714) 795-3100 | ganddini.com

Project No. 19436

TABLE OF CONTENTS

APPENDICES

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

The purpose of this report is to provide an assessment of the noise impacts associated with development and operation of the proposed Harley Knox Industrial 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 City of Perris.

Project Location

The approximately 6.7-acre project site is located at the northwest corner of Harley Knox Boulevard and Las Palmas Avenue in the City of Perris, California. The project site is currently vacant.

Project Description

The proposed project involves construction of a new 142,995 square foot industrial warehousing building (inclusive of 4,000 square foot mezzanine). One right-in/right-out only access driveway for passenger car access is proposed at Harley Knox Boulevard and one full access driveway for truck access is proposed at Las Palmas Avenue.

Construction Impacts

Modeled maximum construction noise levels ranged between 54.2 to 68.6 dBA L_{max} at the nearest residential property lines to the project site.

The project will be subject to Section 7.34.060 of the City of Perris Municipal Code which prohibits construction activities other than between the hours of 7:00 AM and 7:00 PM or on legal holidays, with the exception of Columbus Day and Washington's Birthday, or on Sundays and prohibits construction activity from exceeding 80 dBA Lmax in residential zones within the City.

Construction activities associated with the proposed project would take place within the allowable hours identified in Section 7.34.060 of the City of Perris Municipal Code and would not exceed the City's standard of 80 dBA L_{max} in residential zones. Impacts related to construction noise would be less than significant. Recommended measures to further minimize construction noise are presented in Section 8 of this report.

Land Use/Noise Compatibility

Anticipated future traffic noise levels at the project site were modeled using FHWA Traffic Noise Prediction Model (FHWA-RD-77-108) techniques. Future traffic noise levels at the exterior of the proposed building are expected to reach 73 dBA CNEL which fall into the "conditionally acceptable" category for noise levels at industrial buildings. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally provide up to 20 dB of exterior to interior noise reduction. Hollow four-inch concrete walls have an STC rating of 40 dBA. Impacts to the project will be less than significant. No mitigation is required. The future traffic noise FHWA spreadsheets is provided in Appendix E.

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

Existing and Existing Plus project noise levels along acoustically significant area roadways were modeled utilizing the FHWA Traffic Noise Prediction Model FHWA-RD-77-108 methodology in order to quantify the proposed project's contribution to increases in ambient noise levels.

Project generated vehicle traffic is anticipated to increase ambient noise levels by 0.2 to 0.7 dBA CNEL. Project generated increases in ambient noise levels would be less than 3 dBA CNEL and would be considered less than significant.

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

Existing sensitive land uses that may be affected by project noise include the existing single-family residential dwelling units located approximately 25 feet to the east, 120 feet to the southeast, and 750 feet to the south of the project site.

Project operation is expected to range between 32.9 and 39.3 dBA CNEL at the property line of nearby receptors. Project operation would not exceed the City's General Plan land use compatibility criteria of 60 dBA CNEL at adjacent residential land uses. Residential construction typically provides an exterior to interior noise reduction of 20 dB with a windows-closed condition. Project operation is not expected to exceed the State of California interior noise level standard of 45 dBA CNEL (State of California 2019). This impact would be less than significant. No mitigation is required.

A point noise source representative of larger truck venting air brakes (110 L_w) was utilized to model a maximum noise event near a sensitive receptor. Maximum operational noise levels may reach up to 64.9 dBA at the nearest sensitive receptor and would not exceed the daytime noise standard of 80 dBA L_{max} but would exceed the nighttime noise standard of 60 dBA L_{max}. The impact would be significant, and mitigation is required.

Potentially exceedances in the City's maximum noise event standard during nighttime hours could be mitigated with prohibition of the use of off gassing of air compression braking systems between the hours of 10:00 PM and 7:00 AM. Operational noise impacts would be less than significant with mitigation.

Recommended Operational Noise Reduction Measures

1. Prohibit off-gassing of compression brakes on the project site between the hours of 10:00 PM and 7:00 AM.

Groundborne Vibration Impacts

Construction equipment is anticipated to be located at a distance of at least 186 feet or more from any receptor. Although groundborne vibration may be noticeable at the existing residential dwelling unit to the south of the project site, it would be short-term, would not cause homes to shake or rattle, nor would not exceed the vibration damage threshold of 0.25 PPV in/sec. Temporary vibration levels associated with project construction would be less than significant. Therefore, impacts associated with construction activities would be less than significant. No mitigation is required.

Recommended Construction Noise Reduction Measures

In addition to adherence to the City of Perris Municipal Code which limits the construction hours of operation, the following measures are recommended to reduce construction noise and vibrations, emanating from the proposed project:

1. During all project site excavation and grading on-site, construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturer standards.

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

3. Equipment shall be shut off and not left to idle when not in use.

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

5. Jackhammers, pneumatic equipment and all other portable stationary noise sources shall be shielded, and noise shall be directed away from sensitive receptors.

6. The project proponent shall mandate that the construction contractor prohibit the use of music or sound amplification on the project site during construction.

7. The construction contractor shall limit haul truck deliveries to the same hours specified for construction equipment.

1. INTRODUCTION

This section describes the purpose of this analysis and the project location, proposed development, and study area.

PURPOSE AND OBJECTIVES

The purpose of this report is to provide an assessment of the noise impacts resulting from development of the proposed Harley Knox Industrial 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 City of Perris.

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 approximately 6.7-acre project site is located at the northwest corner of Harley Knox Boulevard and Las Palmas Avenue in the City of Perris, California. The project site is currently vacant. A vicinity map showing the project location is provided on Figure 1.

PROJECT DESCRIPTION

The proposed project involves construction of a new 142,995 square foot industrial warehousing building (inclusive of 4,000 square foot mezzanine). One right-in/right-out only access driveway for passenger car access is proposed at Harley Knox Boulevard and one full access driveway for truck access is proposed at Las Palmas Avenue. Figure 2 illustrates the project site plan.

Figure 1
Project Location Map

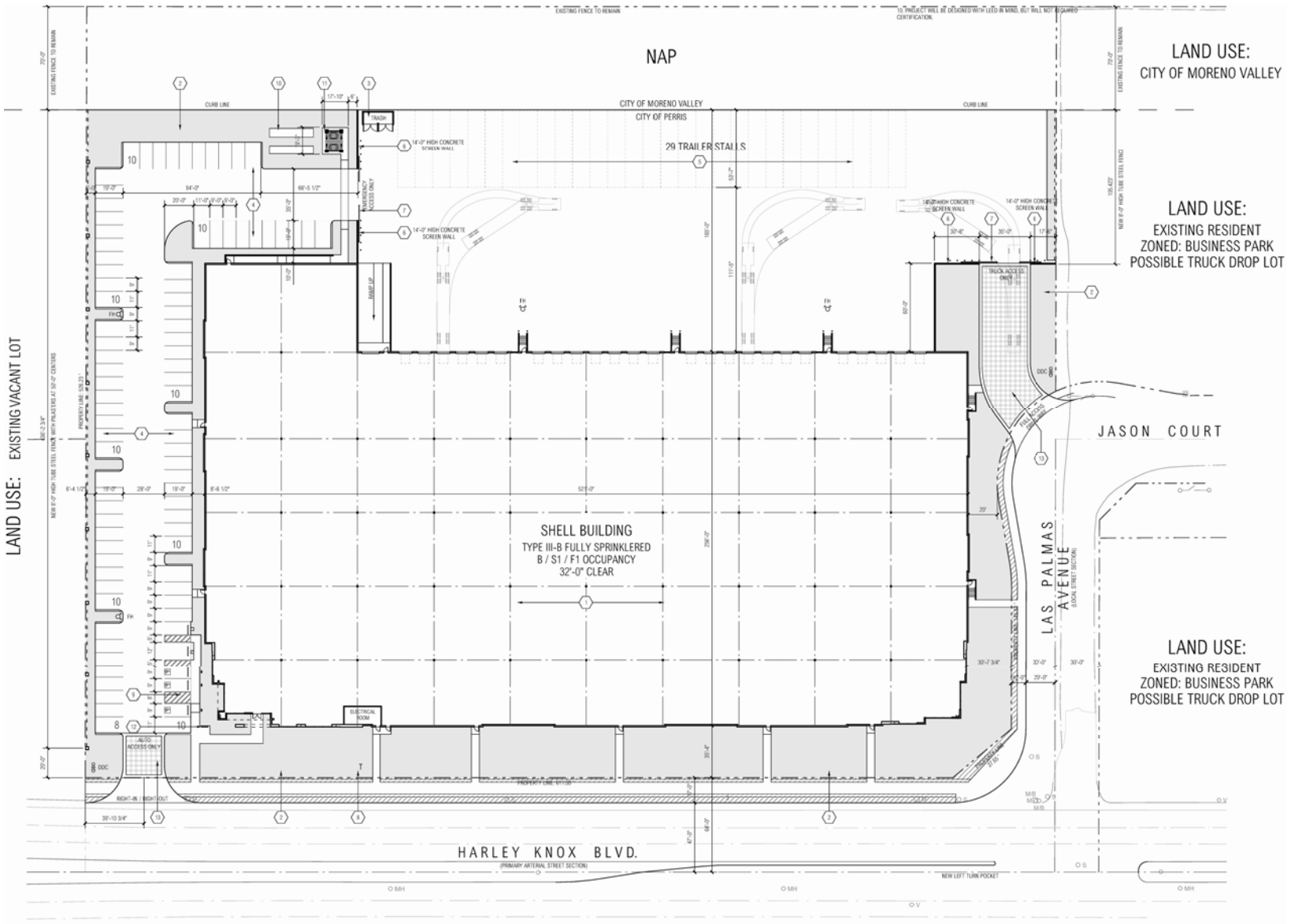


Figure 2
Site Plan

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.

Noise Ordinance standards are often have L_n and L_{max} descriptors. L_n descriptors are 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. The L_{max} 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.

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.

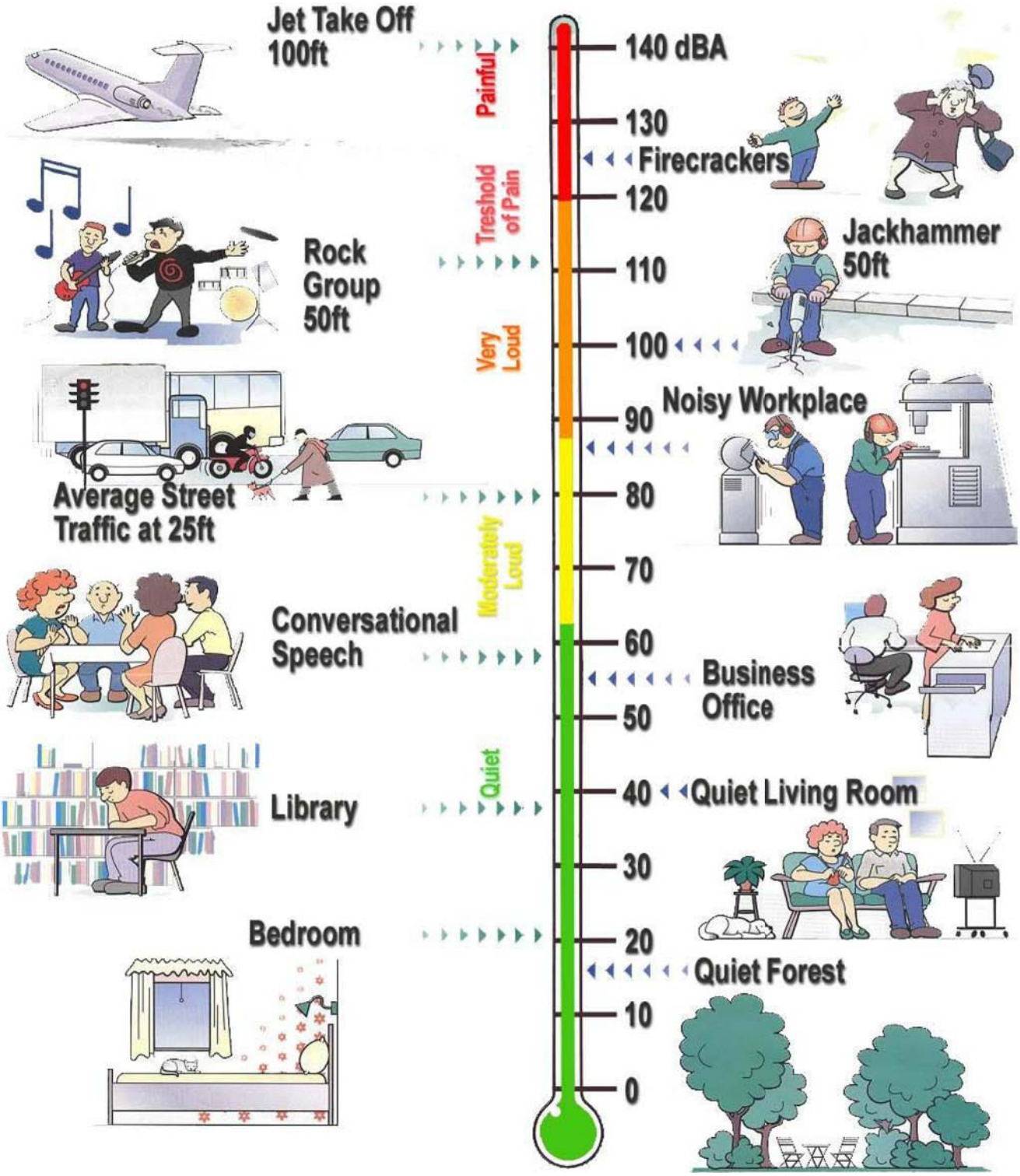
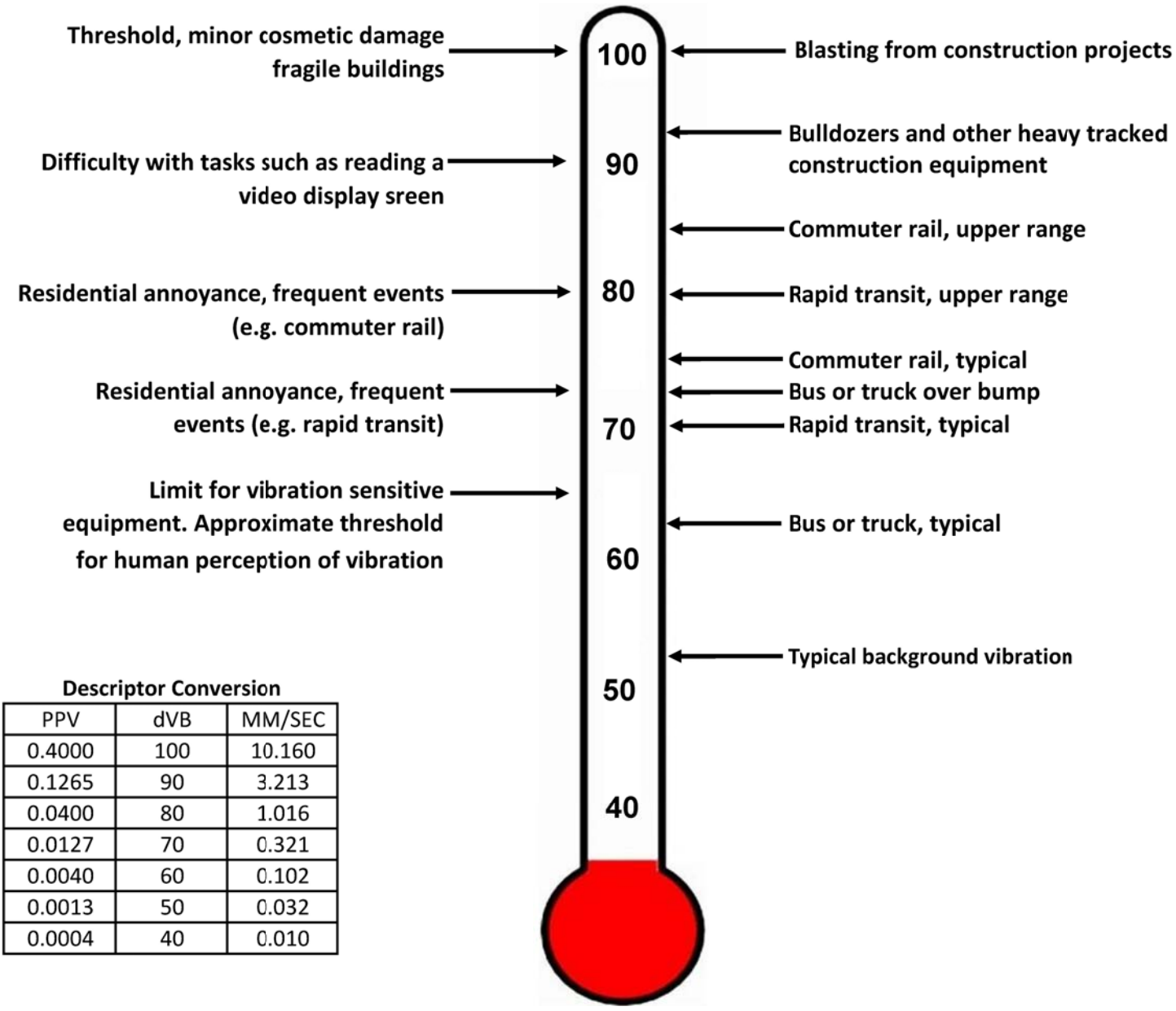


Figure 3
Weighted Sound Levels in Common Environments

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 vacant land to the north, Harley Knox Boulevard to the south, single-family residential, truck storage, and vacant land to the east, and vacant land and commercial uses to the west 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. Existing sensitive land uses that may be affected by project noise include the single-family residential use property lines located approximately 25 feet to the east (across Las Palmas), 120 feet to the southeast (across Harley Knox Boulevard), and 750 feet to the south (along the southern side of E Nance Street) of the project site.

AMBIENT NOISE MEASUREMENTS

An American National Standards Institute (ANSI Section SI.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, three (3) 15-minute daytime noise measurements were taken between 1:36 PM and 2:55 PM on November 15, 2021. In addition, one (1) long-term 24-hour noise measurement were also taken from November 15, 2021, to November 16, 2021. Field worksheets and noise measurement output data are included in Appendix C. As shown on Figure 5, existing ambient noise measurements were taken at the following locations:

- STNM1: Noise measurement was taken near the residential use located approximately 25 feet to the east of the project site on the eastern side of Las Palmas (225 Jason Court, Perris).
- STNM2: Noise measurement was taken near the residential use located approximately 120 feet southeast of the project site along the eastern side of Las Palmas just north of E Nance Street (220 E Nance Street, Perris).
- STNM3: Noise measurement was taken near the residential use located approximately 750 feet south of the project site on the southern side of E Nance Street (115 E Nance Street, Perris).
- LTNM1: Noise measurement was taken along the western boundary of the project site near existing adjacent commercial 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. Measured short-term ambient noise levels ranged between 47.2 and 69.3 dBA L_{eq}. Long-term hourly noise measurement ambient noise levels ranged from 47.3 to 56.2 dBA L_{eq}. The dominant noise source in the project vicinity was vehicle traffic associated with Harley Knox Boulevard, Perris Boulevard, Redlands Avenue, 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	1:36 PM	69.3	87.1	46.1	77.6	74.1	69.8	62.9
STNM2	2:17 PM	47.2	55.9	42.1	53.4	49.6	47.5	46.1
STNM3	2:40 PM	55.5	70.5	47.0	60.4	59.2	56.3	52.9

Notes:
(1) See Figure 5 for noise measurement locations. Each noise measurement was performed over a 15-minute duration.
(2) Noise measurements performed on November 15, 2021.

Table 2
Long-Term Noise Measurement Summary (LTNM1) (dBA)

24-Hour Ambient Noise[1,2]								
Hourly Measurements	Time Started	Leq	Lmax	Lmin	L(2)	L(8)	L(25)	L(50)
Overall Summary	5:00 PM	53.4	77.3	38.2	58.8	56.6	54.4	51.9
1	5:00 PM	54.3	68.7	46.2	59.0	56.8	54.9	53.5
2	6:00 PM	53.5	64.3	47.1	57.9	56.1	54.3	52.7
3	7:00 PM	54.2	69.2	47.7	58.6	56.5	54.9	53.2
4	8:00 PM	53.9	71.2	45.8	58.7	56.2	54.4	52.7
5	9:00 PM	53.3	67.5	46.6	58.8	55.4	53.8	52.2
6	10:00 PM	52.9	66.1	45.8	58.0	55.4	53.5	51.9
7	11:00 PM	51.6	69.0	45.3	56.3	54.0	51.9	50.6
8	12:00 AM	51.9	70.1	45.0	57.6	54.5	51.7	49.9
9	1:00 AM	50.6	59.9	43.8	55.7	53.7	51.4	49.4
10	2:00 AM	51.1	62.3	43.5	56.3	53.8	51.8	50.1
11	3:00 AM	51.9	65.5	44.8	56.5	55.0	52.7	50.7
12	4:00 AM	55.8	67.7	49.4	61.1	58.1	56.3	54.8
13	5:00 AM	55.5	69.3	50.4	59.9	57.8	56.1	54.6
14	6:00 AM	56.2	64.1	52.0	59.6	58.3	56.9	55.7
15	7:00 AM	55.9	64.1	51.7	59.4	57.7	56.3	55.4
16	8:00 AM	53.2	59.7	49.0	56.5	55.2	53.9	52.6
17	9:00 AM	50.8	65.3	45.1	56.6	52.7	50.6	49.4
18	10:00 AM	48.7	62.3	39.7	54.5	51.7	49.2	47.4
19	11:00 AM	49.0	64.8	38.6	58.5	52.4	47.8	45.2
20	12:00 PM	48.6	66.4	39.1	56.5	51.5	47.6	45.2
21	1:00 PM	47.3	64.4	38.2	53.8	50.3	47.8	45.5
22	2:00 PM	52.4	67.8	42.1	59.7	55.1	52.1	50.3
23	3:00 PM	56.1	77.3	47.2	60.4	58.3	56.3	54.6
24	4:00 PM	55.7	69.9	46.2	60.7	58.0	56.4	54.6

Notes:

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

(2) Noise measurement performed from November 15, 2021 to November 16, 2021.

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 City of Perris has adopted their own version of the State Land Use Compatibility Guidelines for land use planning and to assess potential transportation noise impacts to proposed land uses (see Table 3).

California Environmental Quality Act

The California Environmental Quality Act Guidelines (Appendix G) establishes thresholds for noise impact analysis. This noise study includes analysis of noise and vibration impacts necessary to assess the project in light of the following Appendix G Checklist Thresholds.

Would the project result in:

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?

Substantial increases in ambient noise levels are usually associated with project construction noise (temporary) and project operational noise (permanent).

Project Construction Noise: Construction noise sources are regulated within the City of Perris under Section 7.34.060 of the City's Municipal Code which prohibits construction activities other than between the hours of 7:00 AM and 7:00 PM. Construction activities are not permitted on a legal holiday, with the exception of Columbus Day and Washington's Birthday, or on Sundays. Section 7.34.060 also prohibits construction activity from exceeding 80 dBA L_{max} in residential zones within the City.

Project Operational Noise (permanent): The proposed project has the potential to generate on-site and off-site noise. For on-site generated noise, the Noise Element of the City of Perris General Plan identifies noise levels of up to 60 CNEL at existing sensitive receptors as the exterior noise standard. The State of California Building Code requires interior noise levels for multi-family residential land uses to not exceed 45 dBA CNEL. In addition, Section 7.34.040 of the Noise Ordinance prohibits the generation of amplified sound (music and/or human voice) beyond the property line of the property from which the sound emanates that exceeds 80 dBA L_{max} from 7:01 AM to 10:00 PM or 60 dBA L_{max} from 10:01 PM to 7:00 AM at the property line of any residential neighborhood.

For off-site project generated noise, increases in ambient noise could occur along affected roadways due to project generated vehicle traffic. The proposed project site is located within the Perris Valley Commerce Center Specific Plan (PVCCSP) planning area of the City of Perris. The PVCCSP was adopted by the City of Perris on January 12, 2012 (Ordinance No. 1284). Environmental impacts resulting from implementation of allowed development under the PVCCSP have been evaluated in the Perris Valley Commerce Center Specific Plan Final Environmental Impact Report (PVCCSP EIR) (State Clearinghouse No. 2009081086), which was certified by the City of Perris in January 2012. The PVCCSP EIR is a program EIR and project-specific evaluations in later-tier environmental documents for individual development projects within the Specific Plan area was anticipated.

Pursuant to the PVCCSP EIR, project roadway noise impacts shall be considered significant if any of the following occur as a direct result of the proposed development.

When the resulting noise levels at noise-sensitive land uses (e.g., residential, etc.):

1. are less than 60 dBA CNEL and the project creates a 5 dBA CNEL or greater Project-related level increase: or

2. exceed 60 dBA CNEL and the project creates a 3 dBA CNEL or greater project-related noise level increase.

b) Generate excessive groundborne vibration or groundborne noise levels?

As shown in Table 4, the threshold at which there is a risk to "architectural" damage to historic and some older buildings is a peak particle velocity (PPV) of 0.25 in/sec, at older residential structures a PPV of 0.3 in/sec, and at new residential structures a PPV of 0.5 in/sec. Table 5 shows that, in regards to vibrational annoyance, groundborne vibration becomes distinctly perceptible at a PPV of 0.04 in/sec, strongly perceptible at a PPV of 0.1 in/sec, and severe at a PPV of 0.4 in/sec. Impacts would be significant if construction activities result in groundborne vibration of 0.25 in/sec PPV or higher at a sensitive receptor. Impacts related to annoyance would be considered significant if the groundborne vibration exceeded 0.4 in/sec., occurs outside of the allowed hours for construction activities, per City Code 7.34.060, or affects the operation of sensitive equipment.

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 0.25 inches per second (in/sec) PPV not be exceeded for the protection of historic and some old buildings (California Department of Transportation, 2020).

LOCAL REGULATIONS

City of Perris General Plan

Applicable policies and standards governing environmental noise in the City of Perris are set forth in the General Plan Noise Element. Those applicable to the proposed project are presented below:

Goals, Policies, and Implementation Measures

The City of Perris utilizes the following General Plan Noise Element goal, policies and implementation measures to assess evaluate the project's suitability in light of noise impacts.

Goal-1: Land Use Siting: Future land uses compatible with projected noise environments.

Policy I.A:
The State of California Noise/Land Use Compatibility Criteria shall be used in determining land use compatibility for new development.

Implementation Measures
I.A.1 All new development proposals will be evaluated with respect to the State Noise/Land Use Compatibility Criteria. Placement of noise sensitive uses will be discouraged within any area exposed to exterior noise levels that fall into the "Normally Unacceptable" range and prohibited within areas exposed to "Clearly Unacceptable" noise ranges.

Goal-V: Stationary Source Noise: Future non-residential land uses compatible with noise sensitive land uses.

Policy V.A:
New large scale commercial or industrial facilities located within 160 feet of sensitive land uses shall mitigate noise impacts to attain an acceptable level as required by the State of California Noise/Land Use Compatibility Criteria.

Implementation Measures
V.A.1 An acoustical impact analysis shall be prepared for new industrial and large-scale commercial facilities to be constructed within 160 feet of the property line of any existing noise sensitive land use. This analysis

shall document the nature of the commercial or industrial facility as well as all interior or exterior facility operations that would generate exterior noise. The analysis shall document the placement of any existing or proposed noise-sensitive land uses situated within the 160-foot distance. The analysis shall determine the potential noise levels that could be received at these sensitive land uses and specify specific measures to be employed by the large scale commercial or industrial facility to ensure that these levels do not exceed 60 dBA CNEL at the property line of the adjoining sensitive land use. No development permits or approval of land use applications shall be issued until the acoustic analysis is received and approved by the City of Perris Staff.

City of Perris Municipal Code

Chapter 7.34 of the City's Municipal Code establishes base ambient noise levels and establishes maximum noise level limits for stationary noise sources.

7.34.040 Sound Amplification

No person shall amplify sound using sound amplifying equipment contrary to any of the following:

1. The only amplified sound permitted shall be either music or the human voice, or both.

2. The volume of amplified sound shall not exceed the noise levels set forth in this subsection when measured outdoors at or beyond the property line of the property from which the sound emanates.

Time Period	Maximum Noise Level
10:01 PM – 7:00 AM	50 dBA
7:01 AM – 10:00 PM	80 dBA

7.34.050 General Prohibition

(a) It unlawful for any person to willfully make, cause or suffer, or permit to be made or caused, any loud excessive or offensive noises or sounds which unreasonably disturb the peace and quiet of any residential neighborhood or which are physically annoying to persons of ordinary sensitivity or which are so harsh, prolonged or unnatural or unusual in their use, time or place as to occasion physical discomfort to the inhabitants of the city, or any section thereof. The standards for dBA noise level in section 7.34.040 shall apply to this section. To the extent that the noise created causes the noise level at the property line to exceed the ambient noise level by more than 1.0 decibels, it shall be presumed that the noise being created also is in violation of this section.

(b) The characteristics and conditions which should be considered in determining whether a violation of the provisions of this section exists should include, but not be limited to, the following:

(1) The level of the noise;
(2) Whether the nature of the noise is usual or unusual;
(3) Whether the origin of the noise is natural or unnatural;
(4) The level of the ambient noise;
(5) The proximity of the noise to sleeping facilities;
(6) The nature and zoning of the area from which the noise emanates and the area where it is received;
(7) The time of day or night the noise occurs;
(8) The duration of the noise; and
(9) Whether the noise is recurrent, intermittent, or constant.

7.34.060 Hours of Construction

It is unlawful for any person between the hours of 7:00 PM of any day and 7:00 AM of the following day, or on a legal holiday, with the exception of Columbus Day and Washington's birthday, or on Sundays to erect,

construct, demolish, excavate, alter, or repair any building or structure in such a manner as to create disturbing, excessive or offensive noise. Construction activity shall not exceed 80 dBA L_{max} in residential zones in the City of Perris.

7.34.070 Refuse vehicles and parking lot sweepers

No person shall operate or permit to be operated a refuse compacting, processing or collection vehicle or parking lot sweeper between the hours of 7:00 PM to 7:00 AM in any residential area unless a permit has been applied for and granted by the city.

7.34.080 Disturbing, excessive, offensive noises; declaration of certain acts constituting.

The following activities, among others, are declared to cause loud, disturbing, excessive or offensive noises in violation of this section and are unlawful, namely:

(7) Leaf blowers
   a. The term "leaf blower" means any portable, hand-held or backpack, engine-powered device with a nozzle that creates a direct able airstream which is capable of and intended for moving leaves and light materials.
   b. No person shall operate a leaf blower in any residential zoned area between the hours of 7:00 PM and 8:00 AM on weekdays and 5:00 PM and 9:00 AM on weekends or on legal holidays.
   c. No person may operate any leaf blower at a sound level in excess of 80 decibels measured at a distance of 50 feet or greater from the point of noise origin.

Leaf blowers shall be equipped with functional mufflers and an approved sound limiting device required to ensure that the leaf blower is not capable of generating a sound level exceeding any limit prescribed in this section.

19.51.080 Noise

Chapter 19.51 of the City's Municipal Code establishes noise levels and regulations for land uses within the March ARB/IP Airport Overlay Zone (MAOZ).

Airport Related Noise. Noise compatibility standards are intended to prevent the establishment of noise-sensitive land uses in portions of the airport environ that are exposed to significant levels of aircraft noise. Where permitted within the Airport Overlay Zone (AOZ), the following noise-sensitive land uses shall comply with applicable noise exposure criteria:

1) All new residences, schools, libraries, museums, hotels and motels, hospitals and nursing homes, places of worship, and other noise-sensitive uses must have sound attenuation features incorporated into the structures sufficient to reduce interior noise levels from exterior aviation-related sources to no more than CNEL 40 dB. This requirement is intended to reduce the disruptiveness of loud individual aircraft noise events upon uses in this zone and represents a higher standard than the CNEL 45 dB standard set by state and local regulations and the Riverside County ALUC policy.

2) Office space must have sound attenuation features sufficient to reduce the exterior aviation-related noise level to no more than CNEL 45 dB. To ensure compliance with these criteria, an acoustical study shall be required to be completed for any development proposed to be situated where the aviation-related noise exposure is more than 20 dB above the interior standard (e.g., within the CNEL 60 dB contour where the interior standard is CNEL 40 dB).

3) Standard building construction is presumed to provide adequate sound attenuation where the difference between the exterior noise exposure and the interior standard is 20 dB or less.

Table 3
City of Perris Land Use Compatibility Guidelines for Noise

Land Use Category	Community Noise Equivalent Level (CNEL)						
	55	60	65	70	75	80	85
Residential: Low Density Single Family, Duplex, Mobile Homes							
Residential: Multi-Family							
Commercial: Hotels/Motels, Transient Lodging							
Schools, Libraries, Churches, Hospitals, Nursing Homes							
Auditoriums, Concert Halls, Amphitheatres, Meeting Halls							
Sports Arena, Outdoor Spectator Sports							
Playgrounds, Neighborhood Parks							
Golf Courses, Riding Stables, Water Recreation, Cemeteries							
Office Buildings, Business Commercial and Professional, and Mixed-Use Developments							
Industrial, Manufacturing Utilities, Agriculture							

Normally Acceptable:	Specific land use is satisfactory, based up the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
Conditionally Acceptable:	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed insulation features included in the design. Conventional constuction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
Normally Unacceptable:	New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise reduction features included in the design.
Clearly Unacceptable:	New construction or development should generally not be undertaken.

Source: California Governor's Office of Planning and Research, State of California General Plan Guidelines, Appendix C: Guidelines for the Preparation and Content of Noise Elements of the General Plan, February 1976 and City of Perris General Plan, 2005.

Table 4
Guideline Vibration Damage Potential Threshold Criteria

Structure Condition	Maximum PPV (in/sec)	
	Transient Sources[1]	Continuous/Frequent Intermittent Sources[1]
Extremely fragile historic buildings, ruins, anceint 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 5
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.

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, Global Climate Change, HRA, and Energy Impact Analysis prepared for the proposed project (Ganddini Group, Inc., 2021). 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. Construction noise worksheets are provided in Appendix D.

FEDERAL HIGHWAY ADMINISTRATION (FHWA) TRAFFIC NOISE PREDICTION MODEL

Future roadway noise at the project site and increases in ambient noise levels associated with 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 traffic volumes and vehicle mix were obtained from the trip generation provided in the *Harley Knox Industrial Project Transportation Study and Vehicle Miles Traveled Screening Assessment* (Ganddini Group Inc., March 30, 2022). To provide a conservative assessment, it was assumed that all project trips would travel west along Harley Knox Boulevard toward the Interstate 215 Freeway. Existing average daily traffic trips along Harley Knox Boulevard were obtained from a previous project in close proximity to the project site.[3] Existing Plus Project vehicle mixes were calculated by adding the proposed project trips to existing conditions. FHWA spreadsheets are included in Appendix E.

[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] Perris at Harley Knox Beyond Food Mart Project Traffic Impact Analysis, Ganddini Group Inc. (March 30, 2022).

SoundPLAN Noise Model

The SoundPLAN acoustical modeling software was utilized to model worst-case stationary noise impacts associated with project operation at 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.) and much more. 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.

The CNEL associated with project operation was modeled utilizing representative sound levels in the SoundPLAN model. The maximum noise event was calculated from the project site to the nearest sensitive receptor. Modeled noise sources include vehicle movement/parking lot noise, loading and unloading areas, and HVAC equipment. All noise sources were modeled to be in full operation during daytime and evening hours.

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

A maximum noise event associated with the maximum noise level for loading/unloading and release of air brakes (110 L_w)[5] 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.

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

[5] SoundPLAN Noise Model Library Version 8.2. February 10, 2020.

Air Brakes

A point noise source representative of larger truck venting air brakes (110 L_w) was utilized to model a maximum noise event near a sensitive receptor.

Loading/Unloading

The proposed loading area was modeled using a sound reference level for loading/unloading of pallet/ramp with a sound power level of 92 dB per meter.

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.[6] 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 total of 20 rooftop units were modeled on the proposed rooftops. The roof top is 42 feet above grade.

[6] MD Acoustics, LLC Noise Measurement Data for RTU –Carrier 50TFQ0006 and car alarm.

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 City of Perris standards related to construction, operation, and transportation noise related impacts to, or from, the proposed project.

IMPACTS RELATED TO CONSTRUCTION NOISE

The construction phases for the proposed project are anticipated to include 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. The construction activities for the proposed project are anticipated to include grading of approximately 6.7 acres; construction of a 143,168 square foot warehouse building (includes a 4,000 square foot mezzanine) and landscaping of approximately 43,273 square feet; paving of a parking lot with 88 automobile parking spaces and 37 trailer parking spaces; and application of architectural coatings.

The existing residential uses located to the east, southeast, and south of the project site may be affected by short-term noise impacts associated with construction noise. 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.

A summary of noise level data for a variety of construction equipment compiled by the U.S. Department of Transportation is presented in Table 6. Typical operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings.

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 7. Worksheets for each phase are included as Appendix D.

Modeled maximum construction noise levels range between 54.2 to 68.6 dBA L_{max} at the nearest residential property lines to the project site. The expected duration of each phase and the loudest sound level at the nearest receptor (residential land uses to the east) is presented below:

Phase	Number of Days	Maximum Leq
Grading	20	68.6
Building Construction	137	67.6
Paving	20	68.6
Architectural Coating	20	63.4

Section 7.34.060 of the City's municipal code prohibits construction activity from exceeding 80 dBA L_{max} in residential zones within the City. Project construction noise will not exceed the City's construction noise threshold of 80 dBA L_{max} at nearby residential uses. Compliance with Section 7.34.060 of the City's Municipal Code which prohibits construction activities other than between the hours of 7:00 AM and 7:00 PM Monday through Saturday, and construction activities on legal holidays, with the exception of Columbus Day and Washington's Birthday will avoid construction noise impacts during sensitive nighttime hours.

Impacts related to construction noise would be less than significant. Recommended measures to further minimize construction noise are presented in Section 8 of this report.

LAND USE/NOISE COMPATIBILITY

Anticipated future traffic noise levels at the project site were modeled using FHWA Traffic Noise Prediction Model (FHWA-RD-77-108) techniques. Future traffic noise levels at the exterior of the proposed building are expected to reach 73 dBA CNEL which fall into the "conditionally acceptable" category for noise levels at industrial buildings. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally provide up to 20 dB of exterior to interior noise reduction. Hollow four-inch concrete walls have an STC rating of 40 dBA. Impacts to the project will be less than significant. No mitigation is required. The future traffic noise FHWA spreadsheets is provided in Appendix E.

NOISE IMPACTS TO OFF-SITE RECEPTORS DUE TO PROJECT GENERATED TRIPS

During operation, the proposed project is expected to generate 244 average daily trips with 25 trips during the AM peak-hour and 24 trips during the PM peak-hour. A project generated traffic noise level was modeled utilizing the FHWA Traffic Noise Prediction Model - FHWA-RD-77-108. To provide a conservative analysis for each affected roadway, all project generated vehicle trips were assumed to travel west along Harley Knox Boulevard. Traffic noise levels were calculated at the right of way from the centerline of the analyzed roadway. The modeling is theoretical and does not consider 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 8. 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 as summarized in Table 9:

- *Existing (without Project)*: This scenario refers to existing year traffic noise conditions.
- *Existing Plus Project*: This scenario refers to existing year plus project traffic noise conditions.

As shown in Table 9, 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 69-74 dBA CNEL at the right-of-way of each modeled roadway segment.

Pursuant to the PVCCSP EIR, project roadway noise impacts shall be considered significant if any of the following occur as a direct result of the proposed development.

When the resulting noise levels at noise-sensitive land uses (e.g., residential, etc.):

1. are less than 60 dBA CNEL and the project creates a 5 dBA CNEL or greater Project-related level increase: or

2. exceed 60 dBA CNEL and the project creates a 3 dBA CNEL or greater project-related noise level increase.

Project generated vehicle traffic is anticipated to increase the noise between 0.2 to 0.7 dBA CNEL. Project generated increases in ambient noise levels would be less than 3 dBA CNEL and would be considered less than significant.

NOISE IMPACTS TO OFF-SITE RECEPTORS DUE TO ON-SITE OPERATIONAL NOISE

Existing sensitive land uses that may be affected by project noise include the existing single-family residential dwelling units located 25 feet to the east, 120 feet to the southeast, and 750 feet to the south of the project site.

Noise standards that apply to operational noise as discussed in Section 4 of this report are as follows:

- Exterior noise levels of up to 60 CNEL at residential land uses are considered "normally acceptable" The proposed project may result in a significant impact if it causes noise levels at residential land uses to exceed 60 dBA CNEL.

- The State of California Building Code requires interior noise levels for multi-family residential land uses to not exceed 45 dBA CNEL. The project may result in a significant impact if it causes interior noise levels at residential land uses to exceed 45 dBA CNEL.

- Amplified sound (music and/or human voice) beyond the property line of the property from which the sound emanates that exceeds 80 dBA L_{max} from 7:01 AM to 10:00 PM or 60 dBA L_{max} from 10:01 PM to 7:00 AM at the property line of any residential neighborhood is prohibited. The project may result in a significant impact if it results in maximum noise events that exceed 80 dBA.

The SoundPLAN noise model was utilized to calculate the community noise equivalent noise level (CNEL) associated with project operational noise as well as the expected maximum noise level at the nearest sensitive receptors. The modeling effort was very conservative as it was assumed that peak hour operation would occur every hour of the 24-hour period. A description of each noise source and model parameters are discussed in Section 5 of this report. As shown on Figures 6 and 7, project operation is expected to range between 32.9 and 39.3 dBA CNEL at the property line of nearby receptors. Project operation would not exceed the City's General Plan land use compatibility criteria of 60 dBA CNEL at adjacent residential land uses. Residential construction typically provides an exterior to interior noise reduction of 20 dB with a windows-closed condition. Project operation is not expected to exceed the State of California interior noise level standard of 45 dBA CNEL (State of California 2019). This impact would be less than significant. No mitigation is required. As discussed previously, Section 7.34.040 of the City's Noise Ordinance prohibits the generation of amplified sound (music and/or human voice) beyond the property line of the property from which the sound emanates that exceeds 80 dBA L_{max} from 7:01 AM to 10:00 PM or 60 dBA L_{max} from 10:01 PM to 7:00 AM at the property line of the property from which the sound emanates. Section 7.34.050 applies these noise standards to any noise in a residential neighborhood. A point noise source representative of larger truck venting air brakes (110 L_w) was utilized to model a maximum noise event near a sensitive receptor. As shown in Figures 8 and 9 maximum operational noise levels may reach up to 64.9 dBA at the nearest sensitive receptor and would not exceed the daytime noise standard of 80 dBA L_{max} but would exceed the nighttime noise standard of 60 dBA L_{max}. The impact would be significant, and mitigation is required.

Potentially exceedances in the City's maximum noise event standard during nighttime hours could be mitigated with prohibition of the use of off gassing of air compression braking systems between the hours of 10:00 PM and 7:00 AM. Operational noise impacts would be less than significant with mitigation.

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 10, 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.

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 shown in Table 5, in regard to annoyance, vibration becomes severe to people in buildings at a PPV of 0.4 in/sec. Impacts related to annoyance would be considered significant if the groundborne vibration exceeded 0.4 in/sec., occurs outside of the allowed hours for construction activities per City Code 7.34.060 or affects the operation of sensitive equipment.

The closest building is the residential dwelling unit located 186 feet to the east of the project's eastern property line. At 186 feet, use of a vibratory roller would be expected to generate a PPV of 0.01 in/sec and a bulldozer would be expected to generate a PPV of 0.004 in/sec. Construction activities would not cause severe vibration related annoyance at the closest sensitive receptors. Operation of equipment sensitive to low levels of groundborne vibration is unlikely in residential areas. Further, the construction activities are anticipated to comply with the allowed hours for operation outlined in City Code 7.34.060. Impacts from vibration related annoyance would be less than significant. Vibration worksheets are provided in Appendix G.

Architectural Damage

Vibration generated by construction activity has the potential to damage structures. This damage could be structural damage, such as 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)

Table 4 identifies a PPV level of 0.25 in/sec as the threshold at which there is a risk to "architectural" damage to historic and some old buildings. Groundborne vibration associated with the proposed project would not exceed 0.01 PPV in/sec at the nearest sensitive receptor. Temporary vibration levels associated with project construction would be less than significant. No mitigation is required. Vibration worksheets are provided in Appendix G.

IMPACT TO PROJECT FROM AIRPORTS

The closest airport to the project site is the March Air Reserve Base/Inland Port Airport located approximately 1.32 miles to the northwest of the project site. Per the March Air Reserve Base/Inland Port Airport Land Use Compatibility Plan (ALUCP) (2014), the project site is located within Compatibility Zone D (Flight Corridor Buffer). Exhibit S-17 of the Safety Element of the City's General Plan shows that the project site is also located well outside the airport's 60 dBA CNEL noise contour. In addition, Figure 4-2 of the more recent Final Air Installations Compatible Use Zones Study for March Air Reserve Base (Air Force Reserve Command) (AICUZ 2018) also shows that the project site is located outside of the airport's 60 dBA CNEL noise contour.

Per the 2018 AICUZ the Air Force provides planning contours–noise contours based on reasonable projections of future missions and operations. AICUZ studies using planning contours provide a description

of the long-term (5-10 year) aircraft noise environment for projected aircraft operations that is more consistent with the planning horizon used by State, tribal, regional and local planning bodies."

The proposed project is a 143,168 square foot warehouse building. Neither the City of Perris Municipal Code nor the March Air Reserve Base Inland Port ALCUP establish airport noise criteria for industrial or warehouse land uses. Furthermore, as shown in Table MA-2, Basic Compatibility Criteria, of the March Air Reserve Base Inland Port ALCUP, industrial land uses are considered allowed uses within Zone D.

The project would not expose people residing or working in the project area to excessive noise levels associated with airports. This impact would be less than significant. No mitigation is required.

Table 6 (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 6 (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.

Table 7
Construction Noise Levels

Phase	Receptor Location	Construction Noise Levels (dBA Lmax)	Exceeds Daytime 80 dBA Lmax Standard (Y/N)
Grading	East	68.6	N
	Southeast	65.4	N
	South	59.2	N
Building Construction	East	67.6	N
	Southeast	64.4	N
	South	58.2	N
Paving	East	68.6	N
	Southeast	65.4	N
	South	59.2	N
Architectural Coating	East	63.6	N
	Southeast	60.4	N
	South	54.2	N

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

Table 8
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		
Harley Knox Boulevard	East of Perris Boulevard	4,000	4,244	45	Soft
	Perris Boulevard to Indian Avenue	9,600	9,844	45	Soft
	West of Indian Avenue	13,900	14,144	45	Soft

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 traffic volumes and vehicle mix were obtained from the trip generation provided in the Harley Knox Industrial Project Transporation Study and Vehicle Miles Traveled Screening Assessment, Ganddini Group Inc. (March 30, 2022). To provide a conservative assessment, it was assumed that all project trips would travel west along Harley Knox Boulevard toward the Interstate 215 Freeway. Existing average daily traffic tips were obtained from a previous project in close proximity to the project site *Perris at Harley Knox Beyond Food Mart Project Traffic Impact Analysis* , Ganddini Group Inc. (October 6, 2020)].

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

Table 9
Change 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 3 dB or More?
Harley Knox Boulevard	East of Perris Boulevard	64	67.86	68.54	0.68	Yes	No
	Perris Boulevard to Indian Avenue	64	71.66	71.96	0.30	Yes	No
	West of Indian Avenue	64	73.27	73.47	0.20	Yes	No

Notes:

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

(2) Right of way per the City of Perris General Plan Circulation Element.

(3) Per the City of Perris normally acceptable standard for single-family detached residential dwelling units (see Table 3).

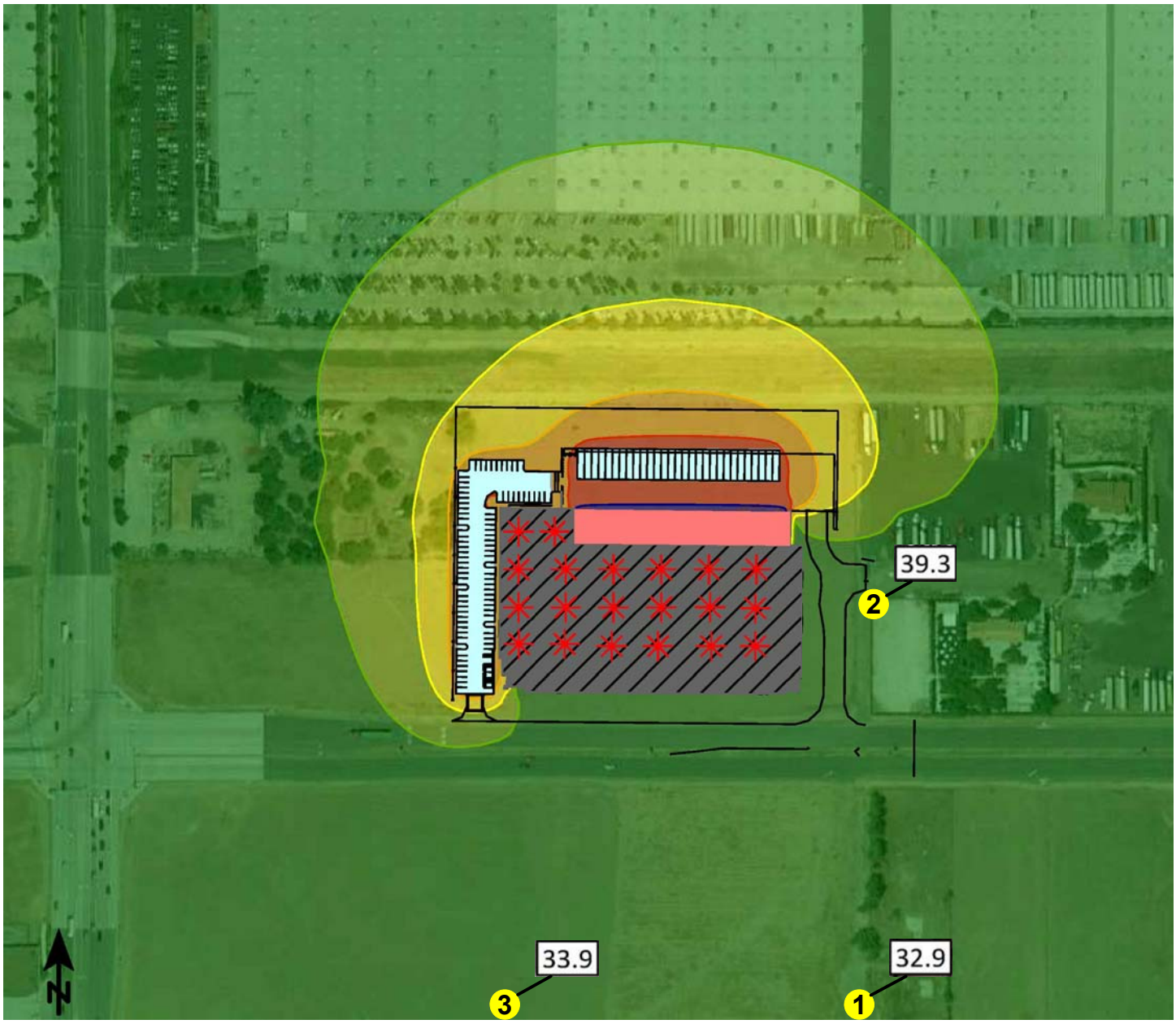
Table 10
Construction Equipment Vibration Source Levels

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

Figure 6
Operational Noise Levels (CNEL)



Signs and symbols

- Proposed building
- HVAC
- Loading Area
- Parking lot

Levels in dB(A)

- <= 45
- 45 - 50
- 50 - 55
- 55 - 60
- 60 - 65
- > 65

Figure 7
Operational Noise Level Contours (CNEL)

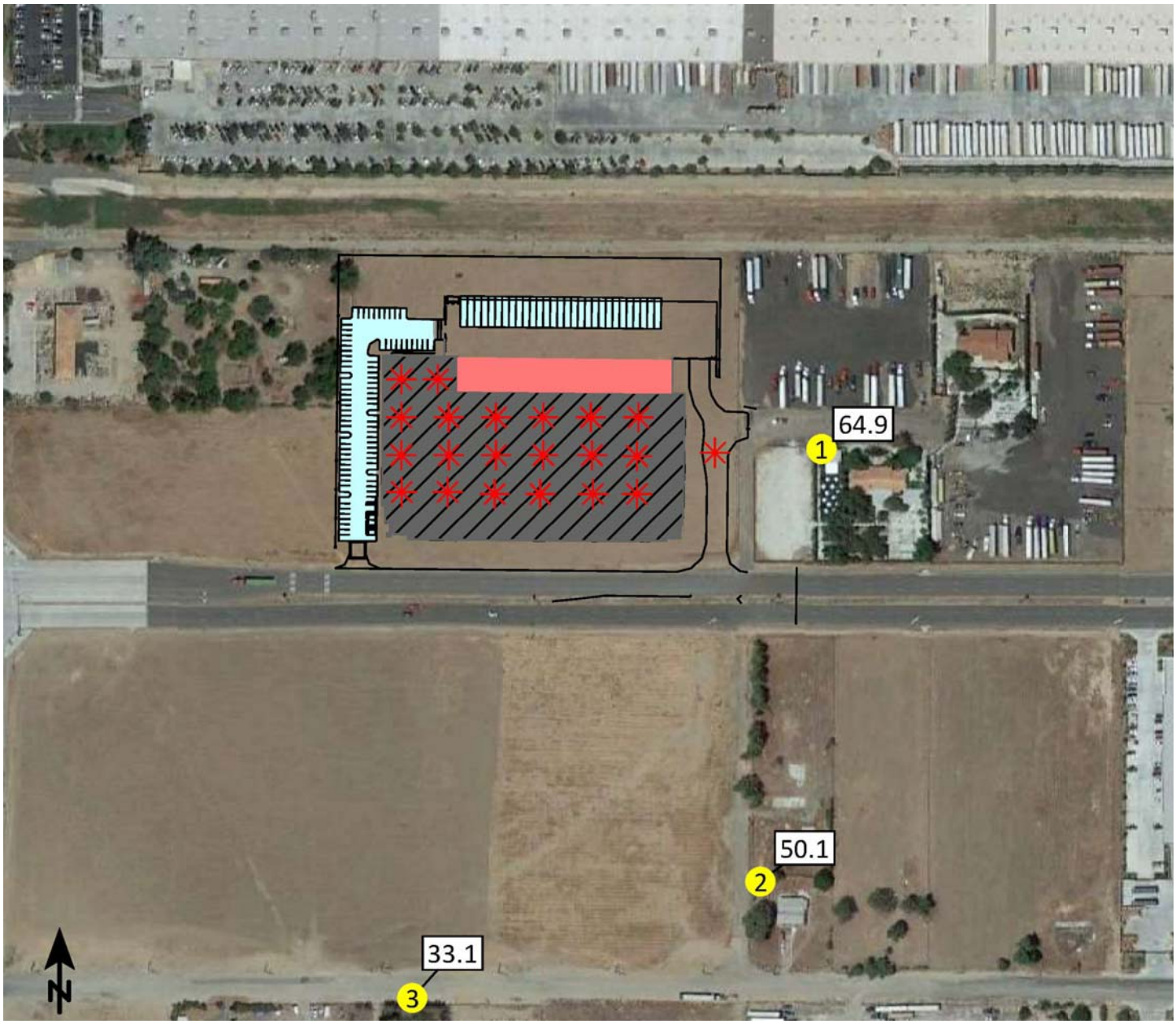


Figure 8
Operational Noise Levels (Lmax)

Signs and symbols

- Proposed building
- HVAC and Air Brake Event
- Loading Area
- Parking lot

Levels in dB(A)

- <= 45
- 45 - 50
- 50 - 55
- 55 - 60
- 60 - 65
- > 65

Figure 9
Operational Noise Contours (Lmax)

7. IMPACTS - CEQA THRESHOLDS

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 With Mitigation:

The City of Perris has established Goals and Policies in the Noise Element of the City's General Plan as well as Ordinances that regulate noise emission in the City that apply to the proposed project. Each of these are summarized below.

The City has included the State of California, Department of Health Land Use/Noise Compatibility Guidelines in the Noise Element of the General Plan. The Land Use/Compatibility Guidelines identify normally acceptable, conditionally acceptable and clearly unacceptable noise levels for siting various new land uses. A conditionally acceptable designation implies new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements for each land use is made and the needed noise insulation features are incorporated in the design. By comparison, a normally acceptable designation indicates that standard construction can occur with no special noise reduction requirements.

Anticipated future traffic noise levels at the project site were modeled using FHWA Traffic Noise Prediction Model (FHWA-RD-77-108) techniques. Future traffic noise levels at the exterior of the proposed building are expected to reach 73 dBA CNEL which fall into the "conditionally acceptable" category for noise levels at industrial buildings. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally provide up to 20 dB of exterior to interior noise reduction. Hollow four-inch concrete walls have an STC rating of 40 dBA. Impacts to the project will be less than significant. No mitigation is required.

General Plan Goal-V, Stationary Noise and implementing Policy V.A requires that an acoustical impact analysis is prepared for new industrial and large-scale commercial facilities to be constructed within 160 feet of the property line of any existing noise sensitive land use. This analysis shall document the nature of the commercial or industrial facility as well as all interior or exterior facility operations that would generate exterior noise. The analysis shall determine the potential noise levels that could be received at these sensitive land uses and specify specific measures to be employed by the large scale commercial or industrial facility to ensure that these levels do not exceed 60 dBA CNEL at the property line of the adjoining sensitive land use.

In order to clarify if the project operational noise would be consistent with the General Plan land use compatibility criteria of 60 dBA CNEL, it was modeled using the SoundPLAN noise model. As shown in Figures 6 and 7, noise associated with project operation is expected to range between 33.9 and 42.5 dBA CNEL at the nearest sensitive receptors and will not exceed the City's 60 dBA CNEL noise standard. This impact is less than significant. No mitigation is required.

Chapter 7.34 of the City's Municipal Code establishes base ambient noise levels and establishes maximum noise level limits (Lmax) for stationary noise sources. In order to estimate maximum noise levels associated with a loud event (Lmax) rather than the 24-hour weighted average associated with a CNEL, a point noise source representative of larger truck venting air brakes (110 L_w) was utilized to model a maximum noise event near a sensitive receptor. Maximum operational noise levels may reach up to 64.9 dBA at the nearest sensitive receptor and would not exceed the daytime noise standard of 80 dBA L_{max} but would exceed the nighttime noise standard of 60 dBA L_{max}. The impact would be significant, and mitigation is required.

Potentially exceedances in the City's maximum noise event standard during nighttime hours could be mitigated with prohibition of the use of off gassing of air compression braking systems between the hours of 10:00 PM and 7:00 AM. Operational noise impacts would be less than significant with mitigation. A measure to avoid exceedance of the maximum noise level standard is included in the list of mitigation measures presented in Section 8 of this report.

Modeled maximum construction noise levels ranged between 54.2 to 68.6 dBA L_{max} at the nearest residential property lines to the project site.

The project will be subject to Section 7.34.060 of the City of Perris Municipal Code which prohibits construction activities other than between the hours of 7:00 AM and 7:00 PM or on legal holidays, with the exception of Columbus Day and Washington's Birthday, or on Sundays and prohibits construction activity from exceeding 80 dBA Lmax in residential zones within the City.

Construction activities associated with the proposed project would take place within the allowable hours identified in Section 7.34.060 of the City of Perris Municipal Code and would not exceed the City's standard of 80 dBA L_{max} in residential zones. Impacts related to construction noise would be less than significant. Recommended measures to further minimize construction noise are presented in Section 8 of this report.

With mitigation, the project would not result in 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. This impact is less than significant with mitigation.

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

Less Than Significant Impact:

There are several types of construction equipment that can cause vibration levels high enough to cause architectural damage and/or annoyance to persons in the vicinity. For example, as shown in Table 10, 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).

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 4, 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

The closest existing structures to the project site a single-family residential dwelling unit located approximately 186 feet to the east project site boundary. Groundborne vibration associated with project construction may reach up to 0.01 PPV in/sec at the nearest residential structure located east of the project site and will not exceed the 0.25 PPV (in./sec.) damage potential threshold. It is very unlikely that construction related groundborne vibration will result in structural damage to nearby structures. This impact is less than significant. No mitigation is required.

As shown in Table 5, in regard to annoyance, vibration becomes severe to people in buildings at a PPV of 0.4 in/sec. Impacts related to annoyance would be considered significant if the groundborne vibration exceeded 0.4 in/sec., occurs outside of the allowed hours for construction activities per City Code 7.34.060 or affects the operation of sensitive equipment. Operation of a vibratory roller may result in groundborne vibration levels of up to 0.04 at a distance of 100 feet. The closest building is the residential dwelling unit located approximately 186 feet to the east of the project's eastern property line. Construction activities would not cause severe vibration related annoyance at the closest sensitive receptors. Operation of equipment sensitive to low levels of groundborne vibration is unlikely in residential areas. Further, the construction activities are

anticipated to comply with the allowed hours for operation outlined in City Code 7.34.060. This impact would be less than significant. No mitigation is required.

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?*

Less Than Significant Impact:

The closest airport to the project site is the March Air Reserve Base/Inland Port Airport located approximately 1.32 miles to the northwest of the project site. Per the March Air Reserve Base/Inland Port Airport Land Use Compatibility Plan (ALUCP) (2014), the project site is located within Compatibility Zone D (Flight Corridor Buffer). Exhibit S-17 of the Safety Element of the City's General Plan shows that the project site is also located well outside the airport's 60 dBA CNEL noise contour. In addition, Figure 4-2 of the more recent Final Air Installations Compatible Use Zones Study for March Air Reserve Base (Air Force Reserve Command) (AICUZ 2018) also shows that the project site is located outside of the airport's 60 dBA CNEL noise contour.

Per the 2018 AICUZ the Air Force provides planning contours–noise contours based on reasonable projections of future missions and operations. AICUZ studies using planning contours provide a description of the long-term (5-10 year) aircraft noise environment for projected aircraft operations that is more consistent with the planning horizon used by State, tribal, regional and local planning bodies."

The proposed project is a 143,168 square foot warehouse building. Neither the City of Perris Municipal Code nor the March Air Reserve Base Inland Port ALCUP establish airport noise criteria for industrial or warehouse land uses. Furthermore, as shown in Table MA-2, Basic Compatibility Criteria, of the March Air Reserve Base Inland Port ALCUP, industrial land uses are considered allowed uses within Zone D.

The project would not expose people residing or working in the project area to excessive noise levels associated with airports. This impact would be less than significant. No mitigation is required.

8. MEASURES TO REDUCE IMPACTS

RECOMMENDED CONSTRUCTION NOISE REDUCTION MEASURES

In addition to adherence to the City of Perris Municipal Code which limits the construction hours of operation, the following measures are recommended to reduce construction noise and vibrations, emanating from the proposed project:

1. During all project site excavation and grading on-site, construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturer standards.

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

3. Equipment shall be shut off and not left to idle when not in use.

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

5. Jackhammers, pneumatic equipment and all other portable stationary noise sources shall be shielded, and noise shall be directed away from sensitive receptors.

6. The project proponent shall mandate that the construction contractor prohibit the use of music or sound amplification on the project site during construction.

7. The construction contractor shall limit haul truck deliveries to the same hours specified for construction equipment.

RECOMMENDED OPERATIONAL NOISE REDUCTION MEASURES

1. Prohibit off-gassing of compression brakes on the project site between the hours of 10:00 PM and 7:00 AM.

9. REFERENCES

California, State of, Department of Transportation
2020 Transportation and Construction Vibration Guidance Manual. April.

California, State of, Building Code
2019 Chapter 12, Section 1206.4 Allowable Interior Noise Levels

Environmental Protection Agency
1974 "Information on Levels of Environmental Noise Requisite to Protect Public Health And Welfare with an Adequate Margin of Safety," EPA/ONAC 550/9-74-004, March 1974.

Federal Transit Administration
2018 Transit Noise and Vibration Impact Assessment Manual. Typical Construction Equipment Vibration Emissions.

Ganddini Group, Inc.
2022 Harley Knox Industrial Project Transportation Study and Vehicle Miles Traveled Screening Assessment. March 30.

Office of Planning and Research
2017 State of California General Plan Guidelines

Perris, City of
2005 City of Perris General Plan. August 30.
2020 City of Perris Municipal Code.

U.S. Department of Transportation
2006 FHWA Roadway Construction Noise Model User's Guide. January.

Carl Stautins
2014 Warehouse & Forklift Noise Exposure – Noise Testing. November 4, 2014.

APPENDICES

Appendix A List of Acronyms
Appendix B Glossary
Appendix C Noise Measurement Field Worksheets
Appendix D Construction Noise Modeling
Appendix E FHWA Worksheets
Appendix F SoundPLAN Input and Output
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

GLOSSARY

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 WORKSHEETS

Noise Measurement
Field Data

Project Name: Harley Knox Industrial Project **Date:** November 15, 2021

Project #: 19436

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

Nearest Address or Cross Street: 225 Jason Ct, Perris, CA 92571

Site Description (Type of Existing Land Use and any other notable features): Project Site: Vacant land w/ Harley Knox Blvd to south, residential & commercial/industrial uses to east, commercial uses and vacant land to west, and vacant land to north. Noise Measurement Site: Harley Knox Blvd to south, single-famil yresidnetia luse to north with commercial/industrial further north & northwest, & project site to west.

Weather: <5% white cloud, filtered sunshine. **Settings:** SLOW FAST

Temperature: 87 deg F **Wind:** 10mph **Humidity:** 12% **Terrain:** Flat

Start Time: 1:36 PM **End Time:** 1:51 PM **Run Time:**

Leq: 69.3 dB

Lmax 87.1 dB

L2 77.6 dB

L8 74.1 dB

L25 69.8 dB

L50 62.9 dB

Primary Noise Source: Traffic noise from the 195 vehicles traveling along Harley Knox Blvd during 15 min measurement. Traffic ambiance from Perris Blvd & other surrounding roads.

Secondary Noise Sources: Some air traffic, March Air Reserve Base runway to WNW of site. Bird song, leaf rustle from 10mph breeze.

NOISE METER:	SoundTrack LXT Class 2	**CALIBRATOR:**	Larson Davis CAL200
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT1	**MODEL:**	Cal 200
SERIAL NUMBER:	1152	**SERIAL NUMBER:**	15741
FACTORY CALIBRATION DATE:	3/31/2021	**FACTORY CALIBRATION DATE:**	7/23/2020
FIELD CALIBRATION DATE:	11/15/2021		

Noise Measurement
Field Data

PHOTOS:

STNM1 looking E down Harley Knox Blvd towards Redlands Ave intersection.
Residence 225 Jason Ct on the left, behind chainlink & white painted wooden fence.

STNM1 looking W down Harley Knox Blvd towards Perris Blvd intersection.

Summary					
File Name on Meter	LxT_Data.182.s				
File Name on PC	LxT_0001152-20211115 133603-LxT_Data.182.ld				
Serial Number	0001152				
Model	SoundTrack LxT®				
Firmware Version	2.404				
User	Ian Edward Gallagher				
Location	STNM1 33°51'26.80"N 117°13'16.58"W				
Job Description	15 minute noise measurement (1 x 15 minutes)				
Note	Ganddini 19436 Harley Knox Industrial Project, City of Perris				
Measurement					
Start	2021-11-15 13:36:03				
Stop	2021-11-15 13:51:03				
Duration	00:15:00.0				
Run Time	00:15:00.0				
Pause	00:00:00.0				
Pre-Calibration	2021-11-15 13:35:43				
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	Low				
OBA Bandwidth	1/1 and 1/3				
OBA Frequency Weighting	Z Weighting				
OBA Max Spectrum	Bin Max				
Overload	144.9 dB				
Results					
LA_{eq}	69.3				
LAE	98.8				
EA	852.169 µPa²h				
EA8	27.269 mPa²h				
EA40	136.347 mPa²h				
$LA_{peak\ (max)}$	2021-11-15 13:49:19		103.7 dB		
LAS_{max}	2021-11-15 13:49:20		87.1 dB		
LAS_{min}	2021-11-15 13:45:38		46.1 dB		
				Statistics	
LC_{eq}	76.0 dB			**LA2.00**	77.6 dB
LA_{eq}	69.3 dB			**LA8.00**	74.1 dB
LC_{eq} - LA_{eq}	6.7 dB			**LA25.00**	69.8 dB
LAI_{eq}	71.9 dB			**LA50.00**	62.9 dB
LA_{eq}	69.3 dB			**LA66.60**	58.1 dB
LAI_{eq} - LA_{eq}	2.6 dB			**LA90.00**	50.4 dB
Overload Count	0				

Noise Measurement
Field Data

Project Name: Harley Knox Industrial Project **Date:** November 15, 2021

Project #: 19436

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

Nearest Address or Cross Street: 220 E Nance Street, Perris, CA 92571

Site Description (Type of Existing Land Use and any other notable features): Project Site: Vacant land w/ Harley Knox Blvd to south, residential & commercial/industrial uses to east, commercial uses and vacant land to west, and vacant land to north. Noise Measurement Site: Single-family residential use to east, Las Palmas Rd to west with vacant land & parked truck trailers further west, & Nance St to south.

Weather: <5% white cloud, filtered sunshine. **Settings:** SLOW FAST

Temperature: 87 deg F **Wind:** 10mph **Humidity:** 12% **Terrain:** Flat

Start Time: 2:17 PM **End Time:** 2:22 PM **Run Time:**

Leq: 47.2 dB **Primary Noise Source:** Traffic ambiance from Harley Knox Blvd, Perris Blvd, Redlands Ave & other surrounding roads.

Lmax 55.9 dB

L2 53.4 dB **Secondary Noise Sources:** Some air traffic, March Air Reserve Base runway is to WNW of site.

L8 49.6 dB Bird song, leaf rustle from 10mph breeze.

L25 47.5 dB

L50 46.1 dB

NOISE METER:	SoundTrack LXT Class 2	**CALIBRATOR:**	Larson Davis CAL200
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT1	**MODEL:**	Cal 200
SERIAL NUMBER:	1152	**SERIAL NUMBER:**	15741
FACTORY CALIBRATION DATE:	3/31/2021	**FACTORY CALIBRATION DATE:**	7/23/2020
FIELD CALIBRATION DATE:	11/15/2021		

Noise Measurement
Field Data

PHOTOS:

STNM2 looking SSE towards residence 220 E Nance Street, Perris.
Residence appears occupied.

STNM2 looking S down Las Palmas towards E Nance Street intersection.
Las Palmas has been fenced off and made private property.

Summary	
File Name on Meter	LxT_Data.183.s
File Name on PC	LxT_0001152-20211115 140720-LxT_Data.183.l
Serial Number	0001152
Model	SoundTrack LxT®
Firmware Version	2.404
User	Ian Edward Gallagher
Location	STNM2 33°51'21.54"N 117°13'18.04"W
Job Description	15 minute noise measurement (1 x 15 minutes)
Note	Ganddini 19436 Harley Knox Industrial Project, City of Perris

Measurement	
Start	2021-11-15 14:07:20
Stop	2021-11-15 14:22:20
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre-Calibration	2021-11-15 14:06:38
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	Low
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	144.9 dB

Results			
L_{Aeq}	47.2		
LAE	76.7		
EA	5.193 µPa²h		
EA8	166.162 µPa²h		
EA40	830.809 µPa²h		
$L_{Apeak\ (max)}$	2021-11-15 14:12:31	87.1 dB	
L_{ASmax}	2021-11-15 14:11:05	55.9 dB	
L_{ASmin}	2021-11-15 14:18:46	42.1 dB	

		Statistics	
L_{Ceq}	66.3 dB	**LA2.00**	53.4 dB
L_{Aeq}	47.2 dB	**LA8.00**	49.6 dB
L_{Ceq} - L_{Aeq}	19.1 dB	**LA25.00**	47.5 dB
L_{AIeq}	50.0 dB	**LA50.00**	46.1 dB
L_{Aeq}	47.2 dB	**LA66.60**	45.4 dB
L_{AIeq} - L_{Aeq}	2.8 dB	**LA90.00**	44.1 dB
Overload Count	0		

Noise Measurement
Field Data

Project Name: Harley Knox Industrial Project **Date:** November 15, 2021

Project #: 19436

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

Nearest Address or Cross Street: 115 E Nance Street, Perris, CA 92571

Site Description (Type of Existing Land Use and any other notable features): Project Site: Vacant land w/ Harley Knox Blvd to south, residential & commercial/industrial uses to east, commercial uses and vacant land to west, and vacant land to north. Noise Measurement Site: E Nance St to the north with vacant land w/ some trailers parked further north, & single-family residential use to the south.

Weather: <5% white cloud, filtered sunshine. **Settings:** SLOW FAST

Temperature: 87 deg F **Wind:** 10mph **Humidity:** 12% **Terrain:** Flat

Start Time: 2:40 PM **End Time:** 2:55 PM **Run Time:**

Leq: 55.5 dB

Lmax 70.5 dB

L2 60.4 dB

L8 59.2 dB

L25 56.3 dB

L50 52.9 dB

Primary Noise Source: Traffic ambiance from Harley Knox Blvd, Perris Blvd, Redlands Ave & other surrounding roads. Truck approaches & stops 30 yards from microphone 2:52PM.

Secondary Noise Sources: Some air traffic, March Air Reserve Base runway is to WNW of site. Bird song, leaf rustle from 10mph breeze. Engine noise from stationary truck.

NOISE METER:	SoundTrack LXT Class 2	**CALIBRATOR:**	Larson Davis CAL200
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT1	**MODEL:**	Cal 200
SERIAL NUMBER:	1152	**SERIAL NUMBER:**	15741
FACTORY CALIBRATION DATE:	3/31/2021	**FACTORY CALIBRATION DATE:**	7/23/2020
FIELD CALIBRATION DATE:	11/15/2021		

Noise Measurement
Field Data

PHOTOS:

STNM3 looking W down E Nance Street towards Perris Blvd intersection.
Residence 115 E Nance Street, Perris on the left.

STNM3 looking E up E Nance Street towards Redlands Ave intersection.

Summary	
File Name on Meter	LxT_Data.184.s
File Name on PC	LxT_0001152-20211115 144036-LxT_Data.184.l
Serial Number	0001152
Model	SoundTrack LxT®
Firmware Version	2.404
User	Ian Eedward Gallagher
Location	STNM3 33°51'19.42"N 117°13'24.81"W
Job Description	15 minute noise measurement (1 x 15 minutes)
Note	Ganddini 19436 Harley Knox industrial Project, City of Perris

Measurement	
Start	2021-11-15 14:40:36
Stop	2021-11-15 14:55:36
Duration	00:15:00.0
Run Time	00:15:00.0
Pause	00:00:00.0
Pre-Calibration	2021-11-15 14:38:40
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	Low
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	144.9 dB

Results				
L_{Aeq}	55.5			
LAE	85.0			
EA	35.110	µPa²h		
EA8	1.124	mPa²h		
EA40	5.618	mPa²h		
$L_{Apeak\ (max)}$	2021-11-15 14:42:38		99.0	dB
L_{ASmax}	2021-11-15 14:43:13		70.5	dB
L_{ASmin}	2021-11-15 14:44:11		47.0	dB

			Statistics	
L_{Ceq}	70.1	dB	**LA2.00**	60.4 dB
L_{Aeq}	55.5	dB	**LA8.00**	59.2 dB
L_{Ceq} - L_{Aeq}	14.6	dB	**LA25.00**	56.3 dB
L_{AIeq}	57.8	dB	**LA50.00**	52.9 dB
L_{Aeq}	55.5	dB	**LA66.60**	51.5 dB
L_{AIeq} - L_{Aeq}	2.4	dB	**LA90.00**	49.2 dB
Overload Count	0			

Noise Measurement
Field Data

Project Name: Harley Knox Industrial Project **Date:** November 15-16,2021

Project #: 19436

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

Nearest Address or Cross Street: 4765 N Perris Blvd, Perris CA 92571

Site Description (Type of Existing Land Use and any other notable features): Project Site: Vacant land w/ Harley Knox Blvd to south, residential & commercial/industrial uses to east, commercial uses and vacant land to west, and vacant land to north. Noise Measurement Site: At western boundary of project site with commercial uses to northwest and surrouding noise meter, Perris Blvd further west and Harley Knox further south.

Weather: 5% -20% cloud, sunny by day. Sunset/rise 4:45PM/6:21AM **Settings:** SLOW FAST

Temperature: 49-75deg F **Wind:** Calm-8mph **Humidity:** 12-40% **Terrain:** Flat

Start Time: 5:00 PM **End Time:** 5:00 PM **Run Time:**

Leq: 53.4 dB **Primary Noise Source:** Traffic ambiance from Harley Knox Blvd, Perris Blvd, Redlands Ave & other surrounding roads.

Lmax 77.3 dB

L2 58.8 dB **Secondary Noise Sources:** Some air traffic, March Air Reserve Base runway is to WNW of site.

L8 56.6 dB Bird song by day, crickets at night, leaf rustle from gentle breeze.

L25 54.4 dB

L50 51.9 dB

NOISE METER:		**CALIBRATOR:**	Larson Davis CAL200
MAKE:	Larson Davis	**MAKE:**	Larson Davis
MODEL:	LXT1	**MODEL:**	Cal 200
SERIAL NUMBER:	1152	**SERIAL NUMBER:**	15741
FACTORY CALIBRATION DATE:	3/31/2021	**FACTORY CALIBRATION DATE:**	7/23/2020
FIELD CALIBRATION DATE:	11/15/2021		

Noise Measurement
Field Data

PHOTOS:

LTNM1 looking NW towards SE corner of building, 4765 N Perris Blvd, Perris.

LTNM1 looking WSW towards Harley Knox Blvd and Perris Blvd intersection.

Summary						
File Name on Meter	LxT_Data.185.s					
File Name on PC	LxT_0001152-20211115 170000-LxT_Data.185.ldbin					
Serial Number	0001152					
Model	SoundTrack LxT®					
Firmware Version	2.404					
User	Ian Edward Gallagher					
Location	LTNM1 33°51'29.46"N 117°13'25.99"W					
Job Description	24 hour noise measurement (24 x 1 hours)					
Note	Ganddini 19436 Harley Knox Industrial Project, City of Perris					
Measurement						
Start	2021-11-15 17:00:00					
Stop	2021-11-16 17:00:00					
Duration	24:00:00.0					
Run Time	24:00:00.0					
Pause	00:00:00.0					
Pre-Calibration	2021-11-15 15:34:39					
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	145.1 dB					
Results						
LA_{eq}	53.4					
LAE	102.7					
EA	2.085 mPa^2h					
EA8	694.971 μPa^2h					
EA40	3.475 mPa^2h					
$LA_{peak\ (max)}$	2021-11-16 15:38:02		95.2 dB			
LAS_{max}	2021-11-16 15:38:02		77.3 dB			
LAS_{min}	2021-11-16 13:27:02		38.2 dB			
				Statistics		
LC_{eq}	65.4 dB			**LA2.00**	58.8 dB	
LA_{eq}	53.4 dB			**LA8.00**	56.6 dB	
LC_{eq} - LA_{eq}	12.1 dB			**LA25.00**	54.4 dB	
LAI_{eq}	54.7 dB			**LA50.00**	51.9 dB	
LA_{eq}	53.4 dB			**LA90.00**	46.2 dB	
LAI_{eq} - LA_{eq}	1.3 dB			**LA99.00**	41.6 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	2021-11-15	17:00:00	01:00:00.0	01:00:00.0	00:00:00.0	54.3	46.2	17:32:46	68.7	17:01:41	59.0	56.8	54.9	53.5	50.0	48.2
2	2021-11-15	18:00:00	01:00:00.0	01:00:00.0	00:00:00.0	53.5	47.1	18:47:13	64.3	18:52:15	57.9	56.1	54.3	52.7	49.7	48.2
3	2021-11-15	19:00:00	01:00:00.0	01:00:00.0	00:00:00.0	54.2	47.7	19:53:12	69.2	19:01:04	58.6	56.5	54.9	53.2	50.7	48.9
4	2021-11-15	20:00:00	01:00:00.0	01:00:00.0	00:00:00.0	53.9	45.8	20:06:26	71.2	20:53:02	58.7	56.2	54.4	52.7	49.5	47.4
5	2021-11-15	21:00:00	01:00:00.0	01:00:00.0	00:00:00.0	53.3	46.6	21:18:22	67.5	21:10:58	58.8	55.4	53.8	52.2	49.5	47.7
6	2021-11-15	22:00:00	01:00:00.0	01:00:00.0	00:00:00.0	52.9	45.8	22:18:44	66.1	22:00:13	58.0	55.4	53.5	51.9	49.3	47.8
7	2021-11-15	23:00:00	01:00:00.0	01:00:00.0	00:00:00.0	51.6	45.3	23:55:26	69.0	23:34:00	56.3	54.0	51.9	50.6	48.0	46.2
8	2021-11-16	00:00:00	01:00:00.0	01:00:00.0	00:00:00.0	51.9	45.0	00:34:33	70.1	00:13:55	57.6	54.5	51.7	49.9	47.4	45.6
9	2021-11-16	01:00:00	01:00:00.0	01:00:00.0	00:00:00.0	50.6	43.8	01:39:22	59.9	01:36:31	55.7	53.7	51.4	49.4	46.4	44.9
10	2021-11-16	02:00:00	01:00:00.0	01:00:00.0	00:00:00.0	51.1	43.5	02:11:29	62.3	02:23:16	56.3	53.8	51.8	50.1	47.1	44.9
11	2021-11-16	03:00:00	01:00:00.0	01:00:00.0	00:00:00.0	51.9	44.8	03:22:09	65.5	03:56:35	56.5	55.0	52.7	50.7	47.9	46.2
12	2021-11-16	04:00:00	01:00:00.0	01:00:00.0	00:00:00.0	55.8	49.4	04:02:36	67.7	04:43:38	61.1	58.1	56.3	54.8	52.0	50.4
13	2021-11-16	05:00:00	01:00:00.0	01:00:00.0	00:00:00.0	55.5	50.4	05:24:01	69.3	05:56:24	59.9	57.8	56.1	54.6	52.4	51.2
14	2021-11-16	06:00:00	01:00:00.0	01:00:00.0	00:00:00.0	56.2	52.0	06:04:15	64.1	06:16:59	59.6	58.3	56.9	55.7	54.1	52.7
15	2021-11-16	07:00:00	01:00:00.0	01:00:00.0	00:00:00.0	55.9	51.7	07:33:07	64.1	07:00:09	59.4	57.7	56.3	55.4	54.0	52.8
16	2021-11-16	08:00:00	01:00:00.0	01:00:00.0	00:00:00.0	53.2	49.0	08:59:37	59.7	08:21:34	56.5	55.2	53.9	52.6	51.1	49.9
17	2021-11-16	09:00:00	01:00:00.0	01:00:00.0	00:00:00.0	50.8	45.1	09:58:04	65.3	09:51:49	56.6	52.7	50.6	49.4	47.9	46.6
18	2021-11-16	10:00:00	01:00:00.0	01:00:00.0	00:00:00.0	48.7	39.7	10:57:34	62.3	10:42:40	54.5	51.7	49.2	47.4	43.6	41.5
19	2021-11-16	11:00:00	01:00:00.0	01:00:00.0	00:00:00.0	49.0	38.6	11:44:09	64.8	11:48:02	58.5	52.4	47.8	45.2	41.9	39.8
20	2021-11-16	12:00:00	01:00:00.0	01:00:00.0	00:00:00.0	48.6	39.1	12:49:24	66.4	12:29:51	56.5	51.5	47.6	45.2	42.3	40.5
21	2021-11-16	13:00:00	01:00:00.0	01:00:00.0	00:00:00.0	47.3	38.2	13:27:02	64.4	13:59:35	53.8	50.3	47.8	45.5	41.7	39.8
22	2021-11-16	14:00:00	01:00:00.0	01:00:00.0	00:00:00.0	52.4	42.1	14:08:18	67.8	14:36:22	59.7	55.1	52.1	50.3	47.2	44.8
23	2021-11-16	15:00:00	01:00:00.0	01:00:00.0	00:00:00.0	56.1	47.2	15:43:15	77.3	15:38:02	60.4	58.3	56.3	54.6	51.2	48.6
24	2021-11-16	16:00:00	01:00:00.0	01:00:00.0	00:00:00.0	55.7	46.2	16:16:00	69.9	16:37:44	60.7	58.0	56.4	54.6	51.4	48.9

APPENDIX D

CONSTRUCTION NOISE MODELING

Receptor - Residential to East

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
Grading									
Excavator	1	85	331	40	0.4	-16.4	-4.0	68.6	64.6
Rubber Tired Dozers	1	85	331	40	0.40	-16.4	-4.0	68.6	64.6
Tractors/Loaders/Backhoes	3	84	331	40	1.20	-16.4	0.8	67.6	68.4
Graders	1	85	331	40	0.40	-16.4	-4.0	68.6	64.6
								Log Sum	71.0
Building Construction									
Cranes	2	83	331	16	0.32	-16.4	-4.9	66.6	61.6
Forklifts[2]	4	48	331	40	1.60	-16.4	2.0	31.6	33.6
Generator Sets	2	81	331	50	1.00	-16.4	0.0	64.6	64.6
Welders	1	74	331	40	0.40	-16.4	-4.0	57.6	53.6
Tractors/Loaders/Backhoes	4	84	331	40	1.60	-16.4	2.0	67.6	69.6
								Log Sum	71.4
Paving									
Pavers	2	77	331	50	1.00	-16.4	0.0	60.6	60.6
Paving Equipment	2	85	331	20	0.40	-16.4	-4.0	68.6	64.6
Rollers	2	80	331	20	0.40	-16.4	-4.0	63.6	59.6
								Log Sum	66.9
Architectural Coating									
Air Compressors	1	80	331	40	0.40	-16.4	-4.0	63.6	59.6
								Log Sum	59.6

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 - Residential to Southeast

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
Grading									
Excavator	1	85	475	40	0.4	-19.6	-4.0	65.4	61.5
Rubber Tired Dozers	1	85	475	40	0.40	-19.6	-4.0	65.4	61.5
Tractors/Loaders/Backhoes	3	84	475	40	1.20	-19.6	0.8	64.4	65.2
Graders	1	85	475	40	0.40	-19.6	-4.0	65.4	61.5
								Log Sum	67.9
Building Construction									
Cranes	2	83	475	16	0.32	-19.6	-4.9	63.4	58.5
Forklifts[2]	4	48	475	40	1.60	-19.6	2.0	28.4	30.5
Generator Sets	2	81	475	50	1.00	-19.6	0.0	61.4	61.4
Welders	1	74	475	40	0.40	-19.6	-4.0	54.4	50.5
Tractors/Loaders/Backhoes	4	84	475	40	1.60	-19.6	2.0	64.4	66.5
								Log Sum	68.2
Paving									
Pavers	2	77	475	50	1.00	-19.6	0.0	57.4	57.4
Paving Equipment	2	85	475	20	0.40	-19.6	-4.0	65.4	61.5
Rollers	2	80	475	20	0.40	-19.6	-4.0	60.4	56.5
								Log Sum	63.8
Architectural Coating									
Air Compressors	1	80	475	40	0.40	-19.6	-4.0	60.4	56.5
								Log Sum	56.5

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 - Residential to South

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
Grading									
Excavator	1	85	972	40	0.4	-25.8	-4.0	59.2	55.2
Rubber Tired Dozers	1	85	972	40	0.40	-25.8	-4.0	59.2	55.2
Tractors/Loaders/Backhoes	3	84	972	40	1.20	-25.8	0.8	58.2	59.0
Graders	1	85	972	40	0.40	-25.8	-4.0	59.2	55.2
								Log Sum	61.7
Building Construction									
Cranes	2	83	972	16	0.32	-25.8	-4.9	57.2	52.3
Forklifts[2]	4	48	972	40	1.60	-25.8	2.0	22.2	24.3
Generator Sets	2	81	972	50	1.00	-25.8	0.0	55.2	55.2
Welders	1	74	972	40	0.40	-25.8	-4.0	48.2	44.2
Tractors/Loaders/Backhoes	4	84	972	40	1.60	-25.8	2.0	58.2	60.3
								Log Sum	62.0
Paving									
Pavers	2	77	972	50	1.00	-25.8	0.0	51.2	51.2
Paving Equipment	2	85	972	20	0.40	-25.8	-4.0	59.2	55.2
Rollers	2	80	972	20	0.40	-25.8	-4.0	54.2	50.2
								Log Sum	57.6
Architectural Coating									
Air Compressors	1	80	972	40	0.40	-25.8	-4.0	54.2	50.2
								Log Sum	50.2

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

FHWA WORKSHEETS

FHWA Sound32 Spreadsheet

Noise Analysis for Harley Knox

Future Traffic Noise

	DAYTIME			EVENING			NIGHTTIME				
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	ADT	43100.00
										SPEED	40.00
										DISTANCE	64.00
INPUT PARAMETERS											
Vehicles per hour	1248.05	25.86	43.10	231.63	1.08	1.80	172.32	26.94	44.90	% A	92.00
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	3.00
NOISE CALCULATIONS											
Reference levels	67.36	76.31	81.16	67.36	76.31	81.16	67.36	76.31	81.16	% HT	5.00
ADJUSTMENTS											
Flow	24.64	7.80	10.02	17.32	-6.00	-3.78	16.04	7.98	10.20		
Distance	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	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	73.24
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	68.84
LEQ	65.85	57.97	65.04	58.54	44.17	51.23	57.25	58.15	65.21	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	68.84		EVENING LEQ	59.41		NIGHT LEQ	66.54		Use hour?	no
										GRADE dB	0.00
	CNEL		73.24								

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

Existing Traffic Noise

Project: **19436 Harley Knox Blvd**

Road: **Placentia Avenue**

Segment: **East of Perris Boulevard**

	DAYTIME			EVENING			NIGHTTIME			ADT	4000.00
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	45.00
										DISTANCE	64.00
INPUT PARAMETERS											
Vehicles per hour	231.67	4.80	8.00	172.00	0.80	1.33	42.67	6.67	11.11	% 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	16.81	-0.03	2.19	15.52	-7.81	-5.59	9.46	1.40	3.62		
Distance	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	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	67.86
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	62.56
LEQ	60.01	51.45	58.19	58.72	43.67	50.41	52.67	52.88	59.62	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	62.56		EVENING LEQ	59.43		NIGHT LEQ	61.12		Use hour?	no
										GRADE dB	0.00
		CNEL	**67.86**								

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

Existing Plus Project Traffic Noise

Project: **19436 Harley Knox Blvd**

Road: **Placentia Avenue**

Segment: **East of Perris Boulevard**

	DAYTIME			EVENING			NIGHTTIME			ADT	4244.00
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	45.00
										DISTANCE	64.00
INPUT PARAMETERS											
Vehicles per hour	242.80	5.80	9.69	180.27	0.97	1.61	44.72	8.05	13.46	% A	90.88
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	3.41
NOISE CALCULATIONS											
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14	% HT	5.71
ADJUSTMENTS											
Flow	17.01	0.79	3.02	15.72	-6.99	-4.76	9.67	2.22	4.45		
Distance	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	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	68.54
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	63.05
LEQ	60.22	52.27	59.02	58.92	44.49	51.24	52.87	53.70	60.45	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	63.05		EVENING LEQ	59.74		NIGHT LEQ	61.87		Use hour?	no
										GRADE dB	0.00
		CNEL	**68.54**								

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

Existing Traffic Noise

Project: **19436 Harley Knox Industrial Project**

Road: **Harley Knox Boulevard**

Segment: **Perris Boulevard to Indian Avenue**

	DAYTIME			EVENING			NIGHTTIME			ADT	9600.00
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	45.00
										DISTANCE	64.00
INPUT PARAMETERS											
Vehicles per hour	556.00	11.52	19.20	412.80	1.92	3.20	102.40	16.00	26.67	% 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	20.61	3.78	6.00	19.32	-4.00	-1.79	13.27	5.20	7.42		
Distance	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	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	71.66
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	66.36
LEQ	63.82	55.26	61.99	62.52	47.48	54.21	56.47	56.68	63.42	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	66.36		EVENING LEQ	63.24		NIGHT LEQ	64.92		Use hour?	no
										GRADE dB	0.00
		CNEL	**71.66**								

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

Existing Plus Project Traffic Noise

Project: **19436 Harley Knox Industrial Project**

Road: **Harley Knox Boulevard**

Segment: **Perris Boulevard to Indian Avenue**

	DAYTIME			EVENING			NIGHTTIME			ADT	9843.76
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	45.00
										DISTANCE	64.00
INPUT PARAMETERS											
Vehicles per hour	567.14	12.52	20.88	421.07	2.09	3.48	104.45	17.38	29.00	% A	91.52
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	3.18
NOISE CALCULATIONS											
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14	% HT	5.30
ADJUSTMENTS											
Flow	20.70	4.14	6.36	19.41	-3.64	-1.42	13.35	5.56	7.79		
Distance	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	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	71.96
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	66.57
LEQ	63.90	55.62	62.36	62.61	47.84	54.58	56.55	57.04	63.79	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	66.57		EVENING LEQ	63.37		NIGHT LEQ	65.25		Use hour?	no
										GRADE dB	0.00
		CNEL	**71.96**								

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

Existing Traffic Noise

Project: **19436 Harley Knox Industrial Project**

Road: **Harley Knox Boulevard**

Segment: **West of Indian Avenue**

	DAYTIME			EVENING			NIGHTTIME			ADT	13900.00
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	45.00
										DISTANCE	64.00
INPUT PARAMETERS											
Vehicles per hour	805.04	16.68	27.80	597.70	2.78	4.63	148.27	23.17	38.61	% 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	22.22	5.38	7.60	20.93	-2.40	-0.18	14.87	6.81	9.03		
Distance	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	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	73.27
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	67.97
LEQ	65.42	56.86	63.60	64.13	49.08	55.82	58.07	58.29	65.03	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	67.97		EVENING LEQ	64.84		NIGHT LEQ	66.53		Use hour?	no
										GRADE dB	0.00
		CNEL	**73.27**								

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

Existing Plus Project Traffic Noise

Project: **19436 Harley Knox Industrial Project**

Road: **Harley Knox Boulevard**

Segment: **West of Indian Avenue**

	DAYTIME			EVENING			NIGHTTIME			ADT	14143.76
	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	AUTOS	M.TRUCKS	H.TRUCKS	SPEED	45.00
										DISTANCE	64.00
INPUT PARAMETERS											
Vehicles per hour	816.18	17.68	29.48	605.97	2.95	4.91	150.32	24.55	40.94	% A	91.67
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	3.12
NOISE CALCULATIONS											
Reference levels	69.34	77.62	82.14	69.34	77.62	82.14	69.34	77.62	82.14	% HT	5.21
ADJUSTMENTS											
Flow	22.28	5.64	7.86	20.99	-2.15	0.08	14.93	7.06	9.28		
Distance	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	-1.14	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	73.47
Constant	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	-25.00	DAY LEQ	68.11
LEQ	65.48	57.12	63.86	64.19	49.33	56.08	58.13	58.54	65.28	Day hour	89.00
										Absorbtive?	no
	DAY LEQ	68.11		EVENING LEQ	64.93		NIGHT LEQ	66.76		Use hour?	no
										GRADE dB	0.00
		CNEL	**73.47**								

APPENDIX F

SOUNDPLAN INPUT AND OUTPUT

Noise emissions of industry sources

Source n	Referer	Level		Frequency spectrum [dB(A)]																													Correctio		
				20	25	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	20	Cwa	CI	C
			dB(A	Hz	Hz	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	kHz	dB	dE	dE
Loading	Lw/m²	Day	92.0	-	-	-	-	-	59.	62.	66.	69.	71.	73.	76.	78.	80.	82.	83.	84.	85.	85.	85.	86.	86.	86.	86.	85.	85.	84.	-	-	-	-	-	-	-
HVAC1	Lw/	Day	78.7	-28	-19	-8.	0.	18.	27.	24.	39.	44.	46.	50.	52.	56.	59.	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51.	48.	41.	33.	-	-	-
HVAC2	Lw/	Day	78.7	-28	-19	-8.	0.	18.	27.	24.	39.	44.	46.	50.	52.	56.	59.	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51.	48.	41.	33.	-	-	-
HVAC3	Lw/	Day	78.7	-28	-19	-8.	0.	18.	27.	24.	39.	44.	46.	50.	52.	56.	59.	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51.	48.	41.	33.	-	-	-
HVAC4	Lw/	Day	78.7	-28	-19	-8.	0.	18.	27.	24.	39.	44.	46.	50.	52.	56.	59.	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51.	48.	41.	33.	-	-	-
HVAC5	Lw/	Day	78.7	-28	-19	-8.	0.	18.	27.	24.	39.	44.	46.	50.	52.	56.	59.	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51.	48.	41.	33.	-	-	-
HVAC6	Lw/	Day	78.7	-28	-19	-8.	0.	18.	27.	24.	39.	44.	46.	50.	52.	56.	59.	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51.	48.	41.	33.	-	-	-
HVAC7	Lw/	Day	78.7	-28	-19	-8.	0.	18.	27.	24.	39.	44.	46.	50.	52.	56.	59.	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51.	48.	41.	33.	-	-	-
HVAC8	Lw/	Day	78.7	-28	-19	-8.	0.	18.	27.	24.	39.	44.	46.	50.	52.	56.	59.	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51.	48.	41.	33.	-	-	-
HVAC9	Lw/	Day	78.7	-28	-19	-8.	0.	18.	27.	24.	39.	44.	46.	50.	52.	56.	59.	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51.	48.	41.	33.	-	-	-
HVAC10	Lw/	Day	78.7	-28	-19	-8.	0.	18.	27.	24.	39.	44.	46.	50.	52.	56.	59.	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51.	48.	41.	33.	-	-	-
HVAC11	Lw/	Day	78.7	-28	-19	-8.	0.	18.	27.	24.	39.	44.	46.	50.	52.	56.	59.	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51.	48.	41.	33.	-	-	-
HVAC12	Lw/	Day	78.7	-28	-19	-8.	0.	18.	27.	24.	39.	44.	46.	50.	52.	56.	59.	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51.	48.	41.	33.	-	-	-
HVAC13	Lw/	Day	78.7	-28	-19	-8.	0.	18.	27.	24.	39.	44.	46.	50.	52.	56.	59.	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51.	48.	41.	33.	-	-	-
HVAC14	Lw/	Day	78.7	-28	-19	-8.	0.	18.	27.	24.	39.	44.	46.	50.	52.	56.	59.	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51.	48.	41.	33.	-	-	-
HVAC15	Lw/	Day	78.7	-28	-19	-8.	0.	18.	27.	24.	39.	44.	46.	50.	52.	56.	59.	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51.	48.	41.	33.	-	-	-
HVAC16	Lw/	Day	78.7	-28	-19	-8.	0.	18.	27.	24.	39.	44.	46.	50.	52.	56.	59.	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51.	48.	41.	33.	-	-	-
HVAC17	Lw/	Day	78.7	-28	-19	-8.	0.	18.	27.	24.	39.	44.	46.	50.	52.	56.	59.	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51.	48.	41.	33.	-	-	-
HVAC18	Lw/	Day	78.7	-28	-19	-8.	0.	18.	27.	24.	39.	44.	46.	50.	52.	56.	59.	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51.	48.	41.	33.	-	-	-
HVAC19	Lw/	Day	78.7	-28	-19	-8.	0.	18.	27.	24.	39.	44.	46.	50.	52.	56.	59.	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51.	48.	41.	33.	-	-	-
HVAC20	Lw/	Day	78.7	-28	-19	-8.	0.	18.	27.	24.	39.	44.	46.	50.	52.	56.	59.	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51.	48.	41.	33.	-	-	-

Noise emissions of parking lot traffic

Name	Parking lot type	Size	Movements per hour			Road surface	Separated method	Lw,ref
			Day	Evening	Night			dB(A)
Autos and Light Trucks	Visitors and staff	85 Parking bays	0.300	0.300	0.300	Asphaltic driving lanes	no	87.0
Truck Parking	Rest stop (Trucks)	37 Parking bays	0.100	0.100	0.100	Asphaltic driving lanes	no	96.3

Receiver list

No.	Receiver name	Building side	Floor	Limit Lden dB(A)	Level w/o NP Lden dB(A)	Level w NP Lden dB(A)	Difference Lden dB	Conflict Lden dB
1	2	-	1.Fl	-	34.0	0.0	-34.0	-
2		-	1.Fl	-	42.5	0.0	-42.5	-
3	3	-	1.Fl	-	33.9	0.0	-33.9	-

Contribution levels of the receivers

Source name			Traffic lane	Level w/o NP Lden dB(A)	Level w NP Lden dB(A)
2	1.Fl	34.0	0.0		
Autos and Light Trucks			-	23.1	-
HVAC1			-	16.9	-
HVAC2			-	17.2	-
HVAC3			-	17.5	-
HVAC4			-	17.9	-
HVAC5			-	18.3	-
HVAC6			-	18.5	-
HVAC7			-	18.8	-
HVAC8			-	19.0	-
HVAC9			-	18.2	-
HVAC10			-	18.7	-
HVAC11			-	19.1	-
HVAC12			-	19.4	-
HVAC13			-	19.7	-
HVAC14			-	19.9	-
HVAC15			-	18.9	-
HVAC16			-	19.4	-
HVAC17			-	20.0	-
HVAC18			-	20.4	-
HVAC19			-	20.8	-
HVAC20			-	21.1	-
Loading Area			-	12.2	-
Truck Parking			-	28.1	-
2	1.Fl	42.5	0.0		
Autos and Light Trucks			-	15.3	-
HVAC1			-	10.2	-
HVAC2			-	11.2	-
HVAC3			-	10.2	-
HVAC4			-	11.6	-
HVAC5			-	13.3	-
HVAC6			-	15.4	-
HVAC7			-	18.1	-
HVAC8			-	22.2	-
HVAC9			-	10.3	-
HVAC10			-	11.7	-
HVAC11			-	13.3	-
HVAC12			-	15.4	-
HVAC13			-	18.2	-
HVAC14			-	22.3	-
HVAC15			-	10.3	-
HVAC16			-	11.6	-
HVAC17			-	13.2	-
HVAC18			-	15.2	-
HVAC19			-	18.2	-
HVAC20			-	22.0	-
Loading Area			-	24.2	-
Truck Parking			-	42.2	-
3	1.Fl	33.9	0.0		
Autos and Light Trucks			-	30.2	-
HVAC1			-	17.1	-
HVAC2			-	17.1	-
HVAC3			-	17.8	-
HVAC4			-	17.8	-
HVAC5			-	17.7	-
HVAC6			-	17.5	-
HVAC7			-	17.3	-
HVAC8			-	17.1	-
HVAC9			-	18.6	-
HVAC10			-	18.5	-
HVAC11			-	18.4	-
HVAC12			-	18.3	-
HVAC13			-	18.0	-

Contribution levels of the receivers

Source name	Traffic lane	Level w/o NP Lden dB(A)	Level w NP Lden dB(A)
HVAC14	-	17.8	-
HVAC15	-	19.4	-
HVAC16	-	19.3	-
HVAC17	-	19.3	-
HVAC18	-	19.1	-
HVAC19	-	18.8	-
HVAC20	-	18.5	-
Loading Area	-	10.3	-
Truck Parking	-	17.1	-

Noise emissions of industry sources

Source r	Refere	Level	Frequency spectrum [dB(A)]																													Correcti		
			20	25	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.	16	20	Cwa	C	C
		dB(A	Hz	Hz	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	kH	dB	dE	dB
Loading	Lw/m²	Day 92.0	-	-	-	-	-	59	62	66	69	71	73	76	78	80	82.0	83.4	84.2	85.0	85.0	85.3	86.0	86.2	86.3	86.0	85.0	85.0	84.0	-	-	-	-	-	-	-
HVAC1	Lw/	Day 78.7	-28	-19	-8.	0.	18	27	24	39	44	46	50	52	56	59	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51	48.	41	33	-	-	-
HVAC2	Lw/	Day 78.7	-28	-19	-8.	0.	18	27	24	39	44	46	50	52	56	59	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51	48.	41	33	-	-	-
HVAC3	Lw/	Day 78.7	-28	-19	-8.	0.	18	27	24	39	44	46	50	52	56	59	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51	48.	41	33	-	-	-
HVAC4	Lw/	Day 78.7	-28	-19	-8.	0.	18	27	24	39	44	46	50	52	56	59	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51	48.	41	33	-	-	-
HVAC5	Lw/	Day 78.7	-28	-19	-8.	0.	18	27	24	39	44	46	50	52	56	59	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51	48.	41	33	-	-	-
HVAC6	Lw/	Day 78.7	-28	-19	-8.	0.	18	27	24	39	44	46	50	52	56	59	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51	48.	41	33	-	-	-
HVAC7	Lw/	Day 78.7	-28	-19	-8.	0.	18	27	24	39	44	46	50	52	56	59	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51	48.	41	33	-	-	-
HVAC8	Lw/	Day 78.7	-28	-19	-8.	0.	18	27	24	39	44	46	50	52	56	59	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51	48.	41	33	-	-	-
HVAC9	Lw/	Day 78.7	-28	-19	-8.	0.	18	27	24	39	44	46	50	52	56	59	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51	48.	41	33	-	-	-
HVAC10	Lw/	Day 78.7	-28	-19	-8.	0.	18	27	24	39	44	46	50	52	56	59	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51	48.	41	33	-	-	-
HVAC11	Lw/	Day 78.7	-28	-19	-8.	0.	18	27	24	39	44	46	50	52	56	59	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51	48.	41	33	-	-	-
HVAC12	Lw/	Day 78.7	-28	-19	-8.	0.	18	27	24	39	44	46	50	52	56	59	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51	48.	41	33	-	-	-
HVAC13	Lw/	Day 78.7	-28	-19	-8.	0.	18	27	24	39	44	46	50	52	56	59	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51	48.	41	33	-	-	-
HVAC14	Lw/	Day 78.7	-28	-19	-8.	0.	18	27	24	39	44	46	50	52	56	59	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51	48.	41	33	-	-	-
HVAC15	Lw/	Day 78.7	-28	-19	-8.	0.	18	27	24	39	44	46	50	52	56	59	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51	48.	41	33	-	-	-
HVAC16	Lw/	Day 78.7	-28	-19	-8.	0.	18	27	24	39	44	46	50	52	56	59	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51	48.	41	33	-	-	-
HVAC17	Lw/	Day 78.7	-28	-19	-8.	0.	18	27	24	39	44	46	50	52	56	59	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51	48.	41	33	-	-	-
HVAC18	Lw/	Day 78.7	-28	-19	-8.	0.	18	27	24	39	44	46	50	52	56	59	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51	48.	41	33	-	-	-
HVAC19	Lw/	Day 78.7	-28	-19	-8.	0.	18	27	24	39	44	46	50	52	56	59	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51	48.	41	33	-	-	-
HVAC20	Lw/	Day 78.7	-28	-19	-8.	0.	18	27	24	39	44	46	50	52	56	59	62.	67.	69.	66.	69.	70.	68.	69.	66.	67.	64.	64.	58.	51	48.	41	33	-	-	-
Air Brak	Lw/uni	Day 110	-	-	-	-	-	77	80	84	87	89	91	94	96	98	100	101	102	103	103	103	104	104	104	104	103	103	102	-	-	-	-	-	-	-

Noise emissions of parking lot traffic

Name	Parking lot type	Size	Movements per hour		Road surface	Separated method	Lw,ref
			Day	Lmax			dB(A)
Autos and Light Trucks	Visitors and staff	85 Parking bays	0.300	0.300	Asphaltic driving lanes	no	87.0
Truck Parking	Rest stop (Trucks)	37 Parking bays	0.100	0.100	Asphaltic driving lanes	no	96.3

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	1	-	1.Fl	-	64.9	0.0	-64.9	-
2	2	-	1.Fl	-	50.2	0.0	-50.2	-
3	3	-	1.Fl	-	33.1	0.0	-33.1	-

Contribution levels of the receivers

Source name			Traffic lane		Level w/o NP Day dB(A)	Level w NP Day dB(A)
1	1.Fl	64.9	0.0	0.0	-64.9	
Air Brakes			-		64.9	64.9
Autos and Light Trucks			-		9.2	-
HVAC1			-		6.1	5.7
HVAC2			-		6.9	6.6
HVAC3			-		6.1	5.7
HVAC4			-		7.2	6.9
HVAC5			-		8.6	8.3
HVAC6			-		10.3	10.0
HVAC7			-		12.6	12.3
HVAC8			-		16.1	15.8
HVAC9			-		6.1	5.8
HVAC10			-		7.3	6.9
HVAC11			-		8.6	8.3
HVAC12			-		10.4	10.0
HVAC13			-		12.7	12.4
HVAC14			-		16.1	15.7
HVAC15			-		6.1	5.8
HVAC16			-		7.2	6.9
HVAC17			-		8.6	8.2
HVAC18			-		10.2	9.9
HVAC19			-		12.8	12.4
HVAC20			-		16.0	15.7
Loading Area			-		15.8	-
Truck Parking			-		34.4	-
2	1.Fl	50.2	0.0	0.0	-50.2	
Air Brakes			-		50.1	50.1
Autos and Light Trucks			-		16.4	-
HVAC1			-		10.2	9.9
HVAC2			-		10.5	10.2
HVAC3			-		10.9	10.5
HVAC4			-		11.3	10.9
HVAC5			-		11.6	11.2
HVAC6			-		11.9	11.5
HVAC7			-		12.1	11.7
HVAC8			-		12.3	12.0
HVAC9			-		11.5	11.2
HVAC10			-		12.0	11.6
HVAC11			-		12.4	12.0
HVAC12			-		12.7	12.4
HVAC13			-		13.0	12.7
HVAC14			-		13.3	12.9
HVAC15			-		12.2	11.8
HVAC16			-		12.7	12.4
HVAC17			-		13.3	12.9
HVAC18			-		13.7	13.4
HVAC19			-		14.2	13.8
HVAC20			-		14.5	14.1
Loading Area			-		5.5	-
Truck Parking			-		21.4	-
3	1.Fl	33.1	0.0	0.0	-33.1	
Air Brakes			-		31.8	31.8
Autos and Light Trucks			-		23.5	-
HVAC1			-		10.4	10.1
HVAC2			-		10.4	10.0
HVAC3			-		11.1	10.8
HVAC4			-		11.1	10.7
HVAC5			-		11.0	10.6
HVAC6			-		10.9	10.5
HVAC7			-		10.7	10.3
HVAC8			-		10.4	10.1
HVAC9			-		11.9	11.5
HVAC10			-		11.9	11.5

Contribution levels of the receivers

Source name	Traffic lane	Level w/o NP Day dB(A)	Level w NP Day dB(A)
HVAC11	-	11.8	11.4
HVAC12	-	11.6	11.2
HVAC13	-	11.4	11.0
HVAC14	-	11.1	10.8
HVAC15	-	12.7	12.4
HVAC16	-	12.7	12.3
HVAC17	-	12.6	12.3
HVAC18	-	12.4	12.1
HVAC19	-	12.1	11.8
HVAC20	-	11.8	11.5
Loading Area	-	3.6	-
Truck Parking	-	10.4	-

APPENDIX G

VIBRATION WORKSHEETS

GROUNDBORNE VIBRATION ANALYSIS			
Project:	19436 Harley Knox Industriall		Date: 10/12/21
Source:	Vibratory Roller		
Scenario:	Unmitigated		
Location:	Single-Family Residential 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 =	186.00	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 =	0.010	IN/SEC	OUTPUT IN BLUE

GROUNDBORNE VIBRATION ANALYSIS			
Project:	19436 Harley Knox Industriall		Date: 10/12/21
Source:	Large Bulldozer		
Scenario:	Unmitigated		
Location:	Single-Family Residential 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 =	186.00	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

GANDDINI GROUP INC.

714.795.3100 | ganddini.com