

NOISE AND VIBRATION IMPACT ANALYSIS

**KIRBY STREET WAREHOUSE PROJECT
HEMET, CALIFORNIA**

LSA

May 2023

NOISE AND VIBRATION IMPACT ANALYSIS

KIRBY STREET WAREHOUSE PROJECT HEMET, CALIFORNIA

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LIST OF ABBREVIATIONS AND ACRONYMS

ADA	Americans with Disabilities Act
APN	Assessor's Parcel Number
CalEEMod	California Emission Estimator Model
CALGreen Code	California Green Building Standards Code
City	City of Hemet
CNEL	Community Noise Equivalent Level
County	County of Riverside
dB	decibel(s)
dBA	A-weighted decibel(s)
EPA	United States Environmental Protection Agency
EIR	Environmental Impact Report
EV	electric vehicle
FHWA	Federal Highway Administration
ft	foot/feet
FTA	Federal Transit Administration
FTA Manual	<i>Transit Noise and Vibration Impact Assessment Manual (FTA 2018)</i>
General Plan EIR	City of Hemet General Plan 2023 Environmental Impact Report
HMC	City of Hemet Municipal Code
HMT	Hemet-Ryan Airport
HVAC	heating, ventilation, and air conditioning
in/sec	inches per second
L _{dn}	day-night average noise level
L _{eq}	equivalent continuous sound level
L _{max}	maximum instantaneous sound level

MMRP	Mitigation Monitoring and Reporting Program
Noise Element	City of Hemet General Plan Noise Element
PPV	peak particle velocity
project	Kirby Street Warehouse Project
RMS	root-mean-square
SPL	sound power level
sq ft	square foot/feet
VdB	vibration velocity decibels

INTRODUCTION

This noise and vibration impact analysis has been prepared to evaluate the potential noise and vibration impacts and reduction measures associated with the Kirby Street Warehouse Project (project) in Hemet, California. This report is intended to satisfy the City of Hemet's (City) requirement for a project-specific noise impact analysis by examining the impacts of the project site and evaluating noise reduction measures that the project may require. In addition, the mitigation measures in the City of Hemet General Plan 2023 Environmental Impact Report (General Plan EIR) Mitigation Monitoring and Reporting Program (MMRP) would apply to the proposed project; therefore, applicable mitigation measures from the General Plan EIR MMRP are identified within.

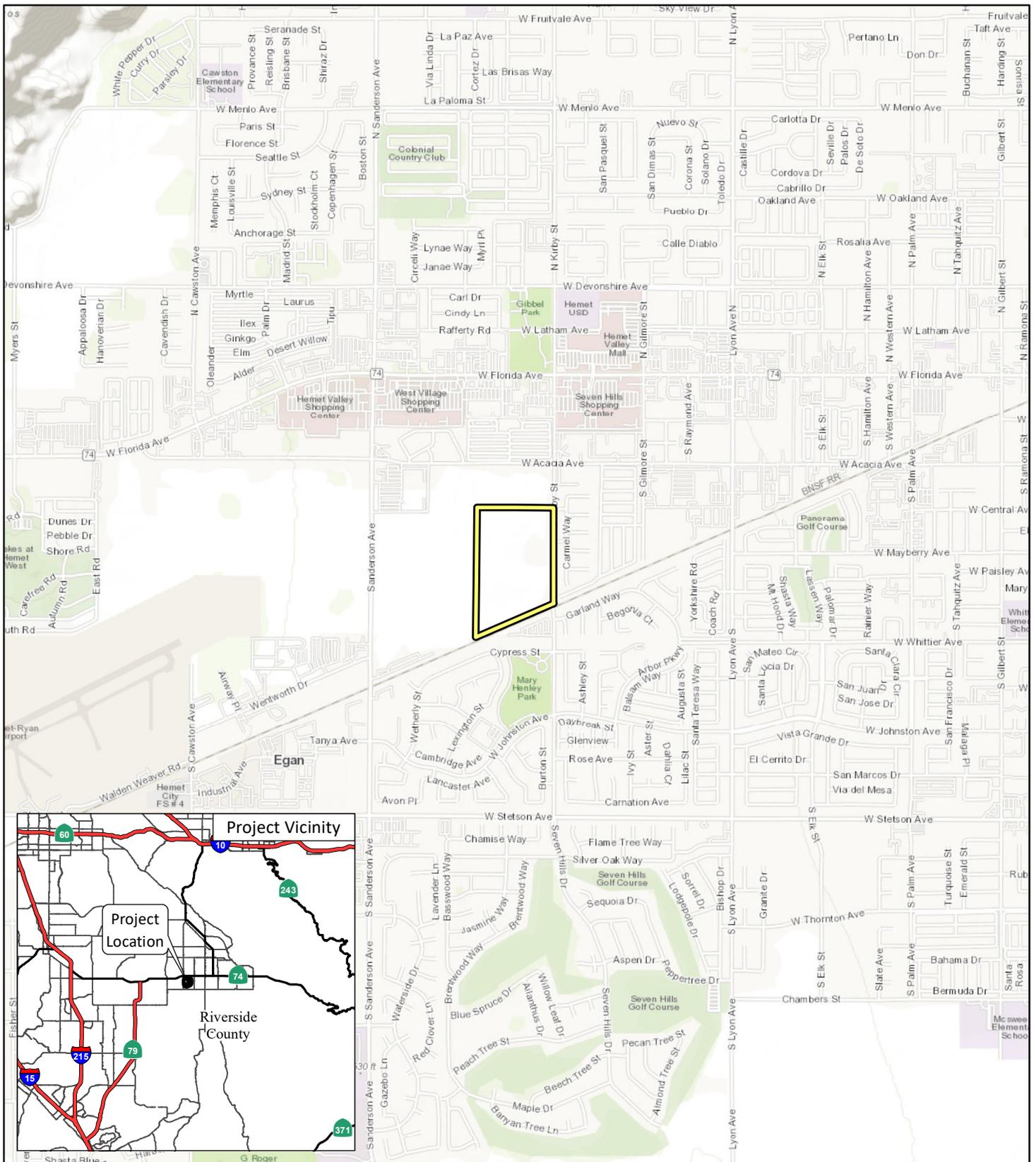
PROJECT LOCATION AND DESCRIPTION

The 41.86-acre project site is located southwest of the intersection of Kirby Street and Acacia Avenue, just north of the Salt Creek Channel in Hemet, Riverside County, California (Assessor's Parcel Number [APN] 456-030-020). Regional access to the project site is provided by Interstate (I) 74. Local access is provided via Kirby Street and Acacia Avenue. See Figure 1, Regional Project Location, and Figure 2, Site Plan, below.

The project proposes to construct an 850,640-square-foot (sq ft) warehouse building, including 831,348 sq ft of warehouse space and 19,292 sq ft of office space. The project would include approximately 199,495 sq ft of landscaping area that would cover about 11 percent of the site. The proposed project would include 955 passenger parking spaces, including electric vehicle (EV) and accessible Americans with Disabilities Act (ADA) spaces, 163 trailer spaces, 132 loading dock doors, and 4 grade level doors.

Typical operational characteristics include employees traveling to and from the site, delivery of products to the site, truck loading and unloading, and truck maintenance operations. The proposed project would be a single-tenant, freestanding distribution building pre-leased to All-Ways Pacific, a global end-to-end distribution company. The warehouse would serve the apparel distribution needs of large, big-box retailers. The project would employ approximately 550 people and would operate 24 hours per day, 7 days per week. In addition, the proposed project would include a 200-horsepower (hp) diesel fire pump and 536 hp diesel backup generator. In addition, the proposed project would not be powered by natural gas, and no natural gas demand is anticipated during construction or operation of the proposed project.

Construction is anticipated to begin in October 2023 and be completed in 12 months, ending in October 2024. The proposed project would require the export of approximately 133,600 cubic yards and the import of 147,300 cubic yards of soil, for a net import of 13,700 cubic yards of soil. Construction activities for the project include grading and excavation, site preparation, building construction, landscape installation, paving, and architectural coatings.



LSA

LEGEND

 Project Location



0 1000 2000
FEET

SOURCE: ESRI Map 2023

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FIGURE 1

Kirby Street Warehouse Project
Project Location and Vicinity

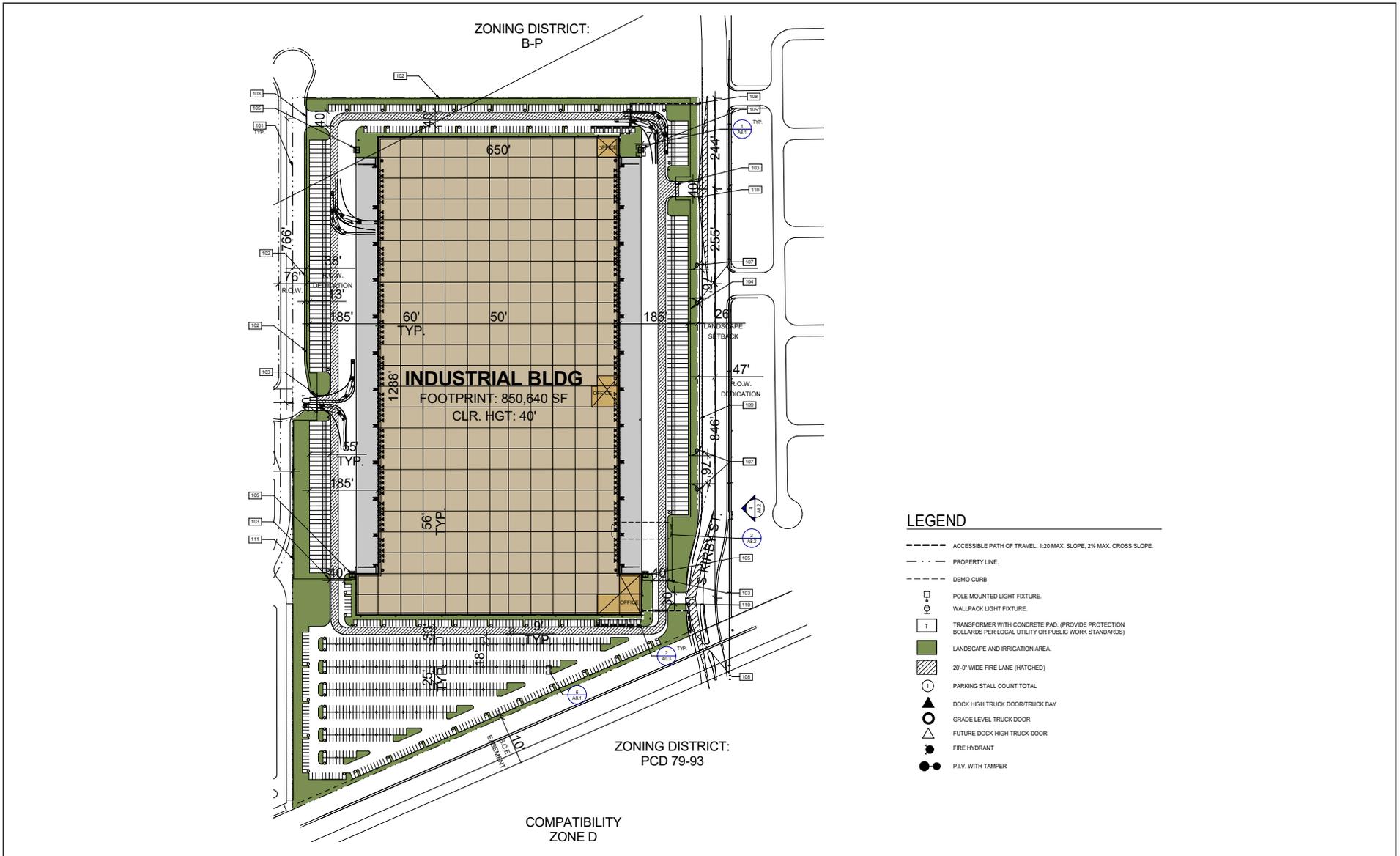
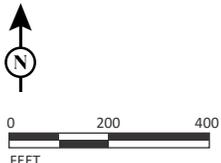


FIGURE 2

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SOURCE: Ware Malcomb

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Kirby Street Warehouse Project
Site Plan

EXISTING LAND USES IN THE PROJECT AREA

The project site is surrounded primarily by residential and commercial uses. The areas adjacent to the project site include the following uses.

- **North:** Existing vacant and undeveloped land followed by an RV resort opposite West Acacia Avenue
- **East:** Existing single-family residences opposite Kirby Street
- **South:** Existing rail tracks followed by an RV storage facility and single-family residences
- **West:** Existing vacant land

The nearest sensitive receptors are:

- **East:** Single-family residences opposite Kirby Street approximately 100 feet (ft) from the project boundary line
- **Southeast:** Single-family residences approximately 165 ft from the project boundary line

CITY OF HEMET GENERAL PLAN EIR MMRP

The General Plan EIR MMRP identified the following mitigation measures that would apply to the proposed project and that would help reduce and avoid potential impacts related to noise and vibration.

- **Mitigation Measure 4.11-5—Construction-Induced Vibration:** Where necessary to reduce potentially significant impacts, the City shall implement or require implementation of the following construction measures through contract provisions and/or conditions of approval as appropriate:
 - Utilize alternative installation methods where possible (e.g., pile cushioning, jetting, pre-drilling, cast-in-place systems, resonance-free vibratory pile drivers) for pile driving required within a 50-foot radius of historic structures. Specifically, geo-pier style cast-in-place systems or equivalent shall be used where feasible as an alternative to pile driving to reduce the number and amplitude of impacts required for seating the pile.
 - Record, in the form of a preconstruction survey, the preexisting condition of all buildings within a 50-foot radius and of historic buildings within the immediate vicinity of proposed construction activities. The preconstruction survey shall determine conditions that exist before construction begins for use in evaluating damage caused by construction activities. Fixtures and finishes within a 50-foot radius of construction activities susceptible to damage shall be documented (photographically and in writing) prior to construction. All damage shall be repaired back to its preexisting condition.

-
- Conduct vibration monitoring prior to and during pile driving operations occurring within 100 feet of the historic structures. Every attempt shall be made to limit construction-generated vibration levels in accordance with Caltrans recommendations during pile driving and impact activities in the vicinity of the historic structures.
 - Provide protective coverings or temporary shoring of on-site or adjacent historic features as necessary, in consultation with the City Building Department.

NOISE AND VIBRATION FUNDAMENTALS

CHARACTERISTICS OF SOUND

Noise is usually defined as unwanted sound. Noise consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, and sleep.

To the human ear, sound has two significant characteristics: pitch and loudness. Pitch is generally an annoyance, while loudness can affect the ability to hear. Pitch is the number of complete vibrations, or cycles per second, of a sound wave, which results in the tone's range from high to low. Loudness is the strength of a sound, and it describes a noisy or quiet environment; it is measured by the amplitude of the sound wave. Loudness is determined by the intensity of the sound waves combined with the reception characteristics of the human ear. Sound intensity is the average rate of sound energy transmitted through a unit of area perpendicular to the direction in which the sound waves are traveling. This characteristic of sound can be precisely measured with instruments. The analysis of a project defines the noise environment of the project area in terms of sound intensity and its effect on adjacent sensitive land uses.

MEASUREMENT OF SOUND

Sound intensity is measured with the A-weighted decibel (dBA) scale to correct for the relative frequency response of the human ear. That is, an A-weighted noise level de-emphasizes low and very high frequencies of sound, similar to the human ear's de-emphasis of these frequencies. Decibels (dB), unlike the linear scale (e.g., inches or pounds), are measured on a logarithmic scale representing points on a sharply rising curve.

For example, 10 dB is 10 times more intense than 0 dB, 20 dB is 100 times more intense than 0 dB, and 30 dB is 1,000 times more intense than 0 dB. Thirty decibels (30 dB) represents 1,000 times as much acoustic energy as 0 dB. The decibel scale increases as the square of the change, representing the sound pressure energy. A sound as soft as human breathing is about 10 times greater than 0 dB. The decibel system of measuring sound gives a rough connection between the physical intensity of sound and its perceived loudness to the human ear. A 10 dB increase in sound level is perceived by the human ear as only a doubling of the sound's loudness. Ambient sounds generally range from 30 dB (very quiet) to 100 dB (very loud).

Sound levels are generated from a source, and their decibel level decreases as the distance from that source increases. Sound levels dissipate exponentially with distance from their noise sources. For a single point source, sound levels decrease approximately 6 dB for each doubling of distance from the source. This drop-off rate is appropriate for noise generated by stationary equipment. If noise is produced by a line source (e.g., highway traffic or railroad operations), the sound decreases 3 dB for each doubling of distance in a hard site environment. Line source sound levels decrease 4.5 dB for each doubling of distance in a relatively flat environment with absorptive vegetation.

There are many ways to rate noise for various time periods, but an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. The equivalent continuous sound level (L_{eq}) is the total sound energy of time-varying noise over a sample period. However, the predominant rating scales for human communities in the State of California are the L_{eq} and Community Noise Equivalent Level (CNEL) or the day-night average noise level (L_{dn}) based on A-weighted decibels. CNEL is the time-weighted average noise over a 24-hour period, with a 5 dBA weighting factor applied to the hourly L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours) and a 10 dBA weighting factor applied to noises occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale but without the adjustment for events occurring during the relaxation. CNEL and L_{dn} are within 1 dBA of each other and are normally interchangeable. The County of Riverside (County) uses the CNEL noise scale for long-term traffic noise impact assessment.

Other noise rating scales of importance when assessing the annoyance factor include the maximum instantaneous noise level (L_{max}), which is the highest sound level that occurs during a stated time period. The noise environments discussed in this analysis for short-term noise impacts are specified in terms of maximum levels denoted by L_{max} , which reflects peak operating conditions and addresses the annoying aspects of intermittent noise. It is often used together with another noise scale, or noise standards in terms of percentile noise levels, in noise ordinances for enforcement purposes. For example, the L_{10} noise level represents the noise level exceeded 10 percent of the time during a stated period. The L_{50} noise level represents the median noise level. Half the time the noise level exceeds this level, and half the time it is less than this level. The L_{90} noise level represents the noise level exceeded 90 percent of the time and is considered the background noise level during a monitoring period. For a relatively constant noise source, the L_{eq} and L_{50} are approximately the same.

Noise impacts can be described in three categories. The first category includes audible impacts, which are increases in noise levels noticeable to humans. Audible increases in noise levels generally refer to a change of 3 dB or greater because this level has been found to be barely perceptible in exterior environments. The second category, potentially audible, refers to a change in the noise level between 1 dB and 3 dB. This range of noise levels has been found to be noticeable only in laboratory environments. The last category includes changes in noise levels of less than 1 dB, which are inaudible to the human ear. Only audible changes in existing ambient or background noise levels are considered potentially significant.

Physiological Effects of Noise

Physical damage to human hearing begins at prolonged exposure to sound levels higher than 85 dBA. Exposure to high sound levels affects the entire system, with prolonged sound exposure in excess of 75 dBA increasing body tensions, thereby affecting blood pressure and functions of the heart and the nervous system. In comparison, extended periods of sound exposure above 90 dBA would result in permanent cell damage. When the sound level reaches 120 dBA, a tickling sensation occurs in the human ear, even with short-term exposure. This level of sound is called the threshold of feeling. As the sound reaches 140 dBA, the tickling sensation is replaced by a feeling of pain in the ear (i.e., the threshold of pain). A sound level of 160–165 dBA will result in dizziness or a

loss of equilibrium. The ambient or background noise problem is widespread and generally more concentrated in urban areas than in outlying, less developed areas.

Table A lists definitions of acoustical terms, and Table B shows common sound levels and their sources.

Table A: Definitions of Acoustical Terms

Term	Definitions
Decibel, dB	A unit of sound measurement that denotes the ratio between two quantities that are proportional to power; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
Frequency, Hz	Of a function periodic in time, the number of times that the quantity repeats itself in 1 second (i.e., the number of cycles per second).
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 and correlates well with subjective reactions to noise. (All sound levels in this report are A-weighted unless reported otherwise.)
L ₀₁ , L ₁₀ , L ₅₀ , L ₉₀	The fast A-weighted noise levels that are equaled or exceeded by a fluctuating sound level 1%, 10%, 50%, and 90% of a stated time period, respectively.
Equivalent Continuous Noise Level, L _{eq}	The level of a steady sound that, in a stated time period and at a stated location, has the same A-weighted sound energy as the time-varying sound.
Community Noise Equivalent Level, CNEL	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 5 dBA to sound levels occurring in the evening from 7:00 p.m. to 10:00 p.m. and after the addition of 10 dBA to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
Day/Night Noise Level, L _{dn}	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 10 dBA to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
L _{max} , L _{min}	The maximum and minimum A-weighted sound levels measured on a sound level meter, during a designated time interval, using fast time averaging.
Ambient Noise Level	The all-encompassing noise associated with a given environment at a specified time. Usually a composite of sound from many sources from many directions, near and far; no particular sound is dominant.
Intrusive	The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, time of occurrence, and tonal or informational content, as well as the prevailing ambient noise level.

Source: *Handbook of Acoustical Measurements and Noise Control* (Harris 1991).

Table B: Common Sound Levels and Their Noise Sources

Noise Source	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Evaluations
Near Jet Engine	140	Deafening	128 times as loud
Civil Defense Siren	130	Threshold of Pain	64 times as loud
Hard Rock Band	120	Threshold of Feeling	32 times as loud
Accelerating Motorcycle at a Few Feet Away	110	Very Loud	16 times as loud
Pile Driver; Noisy Urban Street/ Heavy City Traffic	100	Very Loud	8 times as loud
Ambulance Siren; Food Blender	95	Very Loud	—
Garbage Disposal	90	Very Loud	4 times as loud
Freight Cars; Living Room Music	85	Loud	—
Pneumatic Drill; Vacuum Cleaner	80	Loud	2 times as loud
Busy Restaurant	75	Moderately Loud	—
Near Freeway Auto Traffic	70	Moderately Loud	Reference level
Average Office	60	Quiet	One-half as loud
Suburban Street	55	Quiet	—
Light Traffic; Soft Radio Music in Apartment	50	Quiet	One-quarter as loud
Large Transformer	45	Quiet	—
Average Residence without Stereo Playing	40	Faint	One-eighth as loud
Soft Whisper	30	Faint	—
Rustling Leaves	20	Very Faint	—
Human Breathing	10	Very Faint	Threshold of Hearing
—	0	Very Faint	—

Source: Compiled by LSA (2022).

FUNDAMENTALS OF VIBRATION

Vibration refers to ground-borne noise and perceptible motion. Ground-borne vibration is almost exclusively a concern inside buildings and is rarely perceived as a problem outdoors, where the motion may be discernible, but without the effects associated with the shaking of a building there is less adverse reaction. Vibration energy propagates from a source through intervening soil and rock layers to the foundations of nearby buildings. The vibration then propagates from the foundation throughout the remainder of the structure. Building vibration may be perceived by occupants as the motion of building surfaces, the rattling of items sitting on shelves or hanging on walls, or a low-frequency rumbling noise. The rumbling noise is caused by the vibration of walls, floors, and ceilings that radiate sound waves. Annoyance from vibration often occurs when the vibration exceeds the threshold of perception by 10 dB or less. This is an order of magnitude below the damage threshold for normal buildings.

Typical sources of ground-borne vibration are construction activities (e.g., blasting, pile-driving, and operating heavy-duty earthmoving equipment), steel-wheeled trains, and occasional traffic on rough roads. Problems with both ground-borne vibration and noise from these sources are usually localized to areas within approximately 100 ft from the vibration source, although there are examples of ground-borne vibration causing interference out to distances greater than 200 ft (FTA 2018). When roadways are smooth, vibration from traffic, even heavy trucks, is rarely perceptible. It is assumed for most projects that the roadway surface will be smooth enough that ground-borne

vibration from street traffic will not exceed the impact criteria; however, construction of the project could result in ground-borne vibration that may be perceptible and annoying.

Ground-borne noise is not likely to be a problem because noise arriving via the normal airborne path will usually be greater than ground-borne noise.

Ground-borne vibration has the potential to disturb people and damage buildings. Although it is very rare for train-induced ground-borne vibration to cause even cosmetic building damage, it is not uncommon for construction processes such as blasting and pile-driving to cause vibration of sufficient amplitudes to damage nearby buildings (FTA 2018). Ground-borne vibration is usually measured in terms of vibration velocity, either the root-mean-square (RMS) velocity or peak particle velocity (PPV). The RMS is best for characterizing human response to building vibration, and PPV is used to characterize the potential for damage. Decibel notation acts to compress the range of numbers required to describe vibration. Vibration velocity level in decibels is defined as:

$$L_v = 20 \log_{10} [V/V_{ref}]$$

where “ L_v ” is the vibration velocity in decibels (VdB), “ V ” is the RMS velocity amplitude, and “ V_{ref} ” is the reference velocity amplitude, or 1×10^{-6} inches/second (in/sec) used in the United States.

REGULATORY SETTING

APPLICABLE NOISE STANDARDS

The applicable noise standards governing the project site include the criteria in the City's Public Safety Element of the General Plan (Public Safety Element) and the City of Hemet Municipal Code (HMC).

City of Hemet

Public Safety Element of the General Plan

The Public Safety Element provides the City's goals and strategies related to noise, including the land use compatibility guidelines for community exterior noise environments. Tables 6.4 and 6.5 from the City's General Plan (Tables C and D of this document) outline the noise standards for land use compatibility and the acceptable daytime and nighttime noise performance standards for nontransportation noise sources, respectively. The City has identified the following goals and strategies in the Public Safety Element:

- **Goal PS-11:** Manage noise levels through land use planning and development review.
 - **PS-11.1 Noise Standards:** Enforce noise standards to maintain acceptable noise limits and protect existing areas with acceptable noise environments.
 - **PS-11.2 Design to Minimize Noise:** Encourage the use of siting and building design techniques as a means to minimize noise.
 - **PS-11.3 Evaluate Noise:** Evaluate potential noise conflicts for individual sites and projects and require mitigation of all significant noise impacts (including construction and short-term noise impacts) as a condition of project approval.
 - **PS-11.4 Protect Noise-Sensitive Uses:** Protect noise-sensitive uses from new noise sources.
- **Goal PS-12:** Minimize noise conflicts from transportation sources and airports.
 - **PS-12.1 Traffic Noise:** Minimize noise conflicts between current and proposed land uses and the circulation network by encouraging compatible land uses around critical roadway segments with higher noise potential.
 - **PS-12.3 Airport Noise:** Ensure that future development in the vicinity of Hemet-Ryan Airport is compatible with current and projected airport noise levels in accordance with the noise standards presented in Table 6.4 (Table C of this document).
- **Goal PS-13:** Minimize noise conflicts with stationary noise generators.
 - **PS-13.1 Protect Valuable Noise Sources:** Protect the continued viability of economically valuable noise sources such as commercial and industrial facilities and the Hemet-Ryan Airport.

- **PS-13.2 New Sensitive Uses:** Restrict the location of sensitive land uses near major noise sources to achieve the standards present in Table 6.4 (Table C of this document).
- **PS-13.3 Prevent Encroachment:** Prevent the encroachment of noise sensitive land uses into areas designated for use by existing or future noise generators.

Table C: Land Use Compatibility Standards for Exterior and Interior Noise

Land Uses (Receiving Noise)	Maximum Exterior CNEL (dBA)	Maximum Interior CNEL (dBA)
Rural, Single-Family, Multiple-Family Residential	65	45
Schools:		
Classrooms	65	45
Playgrounds	70	-
Libraries	-	50
Hospitals/Convalescent Facilities:		
Living Areas	-	50
Sleeping Areas	-	40
Recreation:		
Quiet, Passive Areas	65	-
Noisy, Active Areas	70	-
Commercial and Industrial	70	-
Office Areas	-	50

Source: City of Hemet General Plan (2012).
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels

Table D: Noise Level Performance Standards for Nontransportation Noise Sources

Noise Level Descriptor	Daytime (7:00 a.m.–10:00 p.m.)	Nighttime (10:00 p.m.–7:00 a.m.)
Equivalent continuous sound level (L_{eq})	60 dBA	45 dBA
Maximum instantaneous sound level (L_{max})	75 dBA	65 dBA

Source: City of Hemet General Plan (2012).
dBA = A-weighted decibels

City of Hemet Municipal Code

Construction Noise. Chapter 30, Article II, Section 30-32(33) of the HMC permits construction activities between the hours of 6:00 a.m. and 6:00 p.m. during the months of June through September and between the hours of 7:00 a.m. and 6:00 p.m. during the months of October through May. Exceptions to these standards may be granted only by the City building official and/or the City Council. Construction occurring consistent with these provisions is exempt from regulation.

State of California Green Building Standards Code

The State of California’s Green Building Standards Code (CALGreen Code) contains mandatory measures for nonresidential building construction in Section 5.507 on Environmental Comfort.

These noise standards are applied to new construction in California for controlling interior noise levels resulting from exterior noise sources. The regulations specify that acoustical studies must be prepared when nonresidential structures are developed in areas where the exterior noise levels exceed 65 dBA CNEL, such as within a noise contour of an airport, freeway, railroad, or other noise source. If the development falls within an airport or freeway 65 dBA CNEL noise contour, buildings shall be constructed to provide an interior noise level environment attributable to exterior sources that does not exceed an hourly equivalent level of 50 dBA L_{eq} in occupied areas during any hour of operation.

Federal Transit Administration

Though the City does not have daytime construction noise level limits for activities that occur within the specified hours of the HMC to determine potential California Environmental Quality Act (CEQA) noise impacts, construction noise was assessed using criteria from the *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018) (FTA Manual). Table E shows the FTA’s Detailed Assessment Construction Noise Criteria based on the composite noise levels per construction phase.

Table E: Detailed Assessment Daytime Construction Noise Criteria

Land Use	Daytime 1-hour L_{eq} (dBA)
Residential	80
Commercial	85
Industrial	90

Source: *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018).

dBA = A-weighted decibels

L_{eq} = equivalent continuous sound level

APPLICABLE VIBRATION STANDARDS

Federal Transit Administration

Vibration standards included in the FTA Manual are used in this analysis for ground-borne vibration impacts on human annoyance. The criteria for environmental impact from ground-borne vibration and noise are based on the maximum levels for a single event. Table F provides the criteria for assessing the potential for interference or annoyance from vibration levels in a building.

Table G lists the potential vibration building damage criteria associated with construction activities, as suggested in the FTA Manual. FTA guidelines show that a vibration level of up to 0.5 in/sec in PPV is considered safe for buildings consisting of reinforced concrete, steel, or timber (no plaster), and would not result in any construction vibration damage. For non-engineered timber and masonry buildings, the construction building vibration damage criterion is 0.2 in/sec in PPV.

Table F: Interpretation of Vibration Criteria for Detailed Analysis

Land Use	Max L _v (VdB) ¹	Description of Use
Workshop	90	Vibration that is distinctly felt. Appropriate for workshops and similar areas not as sensitive to vibration.
Office	84	Vibration that can be felt. Appropriate for offices and similar areas not as sensitive to vibration.
Residential Day	78	Vibration that is barely felt. Adequate for computer equipment and low-power optical microscopes (up to 20×).
Residential Night and Operating Rooms	72	Vibration is not felt, but ground-borne noise may be audible inside quiet rooms. Suitable for medium-power microscopes (100×) and other equipment of low sensitivity.

Source: *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018).

¹ As measured in 1/3-Octave bands of frequency over the frequency range 8 to 80 Hertz.

FTA = Federal Transit Administration

Max = maximum

VdB = vibration velocity decibels

L_v = velocity in decibels

Table G: Construction Vibration Damage Criteria

Building Category	PPV (in/sec)
Reinforced concrete, steel, or timber (no plaster)	0.50
Engineered concrete and masonry (no plaster)	0.30
Non-engineered timber and masonry buildings	0.20
Buildings extremely susceptible to vibration damage	0.12

Source: *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018).

FTA = Federal Transit Administration

PPV = peak particle velocity

in/sec = inch/inches per second

OVERVIEW OF THE EXISTING NOISE ENVIRONMENT

The primary existing noise sources in the project area are traffic on Kirby Street and infrequent rail activity to the south.

AMBIENT NOISE MEASUREMENTS

Long-Term Noise Measurements

To assess existing noise levels, LSA conducted three long-term noise measurements in the vicinity of the project site. The long-term (24-hour) noise level measurements were conducted on January 17 through January 18, 2023, using three Larson Davis Spark 706RC Dosimeters. Table G provides a summary of the measured hourly and maximum noise levels from the long-term noise level measurements. As shown in Table H, the calculated hourly noise levels range from 39.3 dBA L_{eq} to 75.1 dBA L_{eq} . Maximum noise levels at surrounding sensitive uses are as low as 52.9 dBA L_{max} during nighttime hours and 89.1 dBA L_{max} during daytime hours. Noise measurement sheets are provided in Appendix A. Figure 3 shows the long-term monitoring locations.

Table H: Long-Term 24-Hour Ambient Noise Monitoring Results

Location		Daytime Noise Levels ¹ (dBA L_{eq})	Daytime Noise Levels ² (dBA L_{max})	Nighttime Noise Levels ³ (dBA L_{eq})	Nighttime Noise Levels ³ (dBA L_{max})
LT-1	West of a single-family residence at 401 Carmel Way, on a utility pole, approximately 40 ft from the Kirby Street centerline.	69.6–75.1	84.4–89.1	60.4–71.5	80.4–88.6
LT-2	Southwest of a single-family residence at 591 Carmel Way, on a utility pole, approximately 70 ft from the Kirby Street centerline.	66.7–72.2	79.4–87.9	57.6–69.3	74.6–85.0
LT-3	Southwestern corner of the project site, north of the railroad tracks, approximately 25 ft from the railroad tracks.	42.8–49.3	57.2–63.2	39.9–48.8	52.9–62.1

Source: Compiled by LSA (2023).

Note: Noise measurements were conducted from January 17 to January 18, 2023, starting at 12:00 p.m.

¹ Daytime Noise Levels = noise levels during the hours from 7:00 a.m. to 10:00 p.m.

² Nighttime Noise Levels = noise levels during the hours from 10:00 p.m. to 7:00 a.m.

dBA = A-weighted decibels

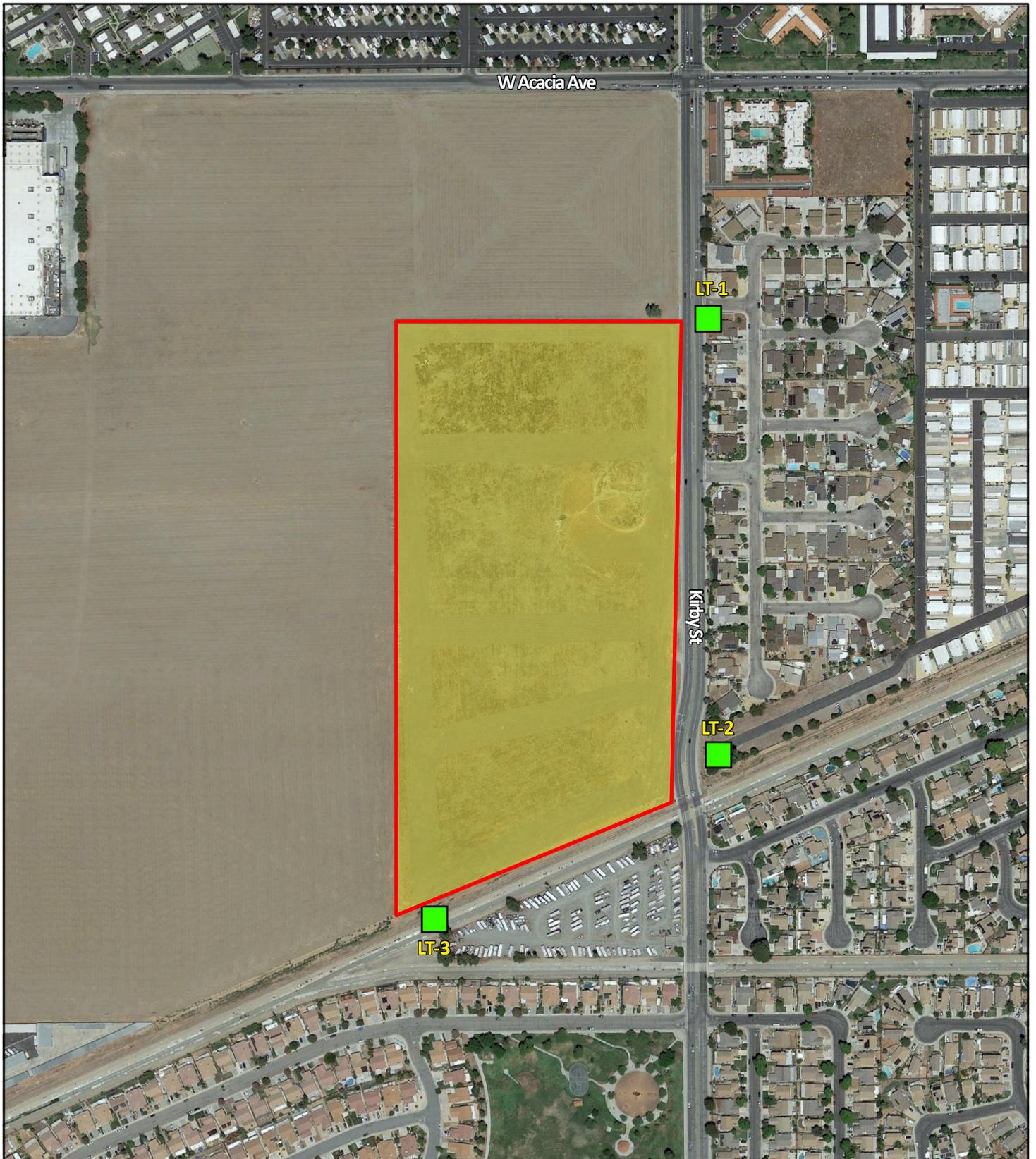
L_{max} = maximum sound level

ft = foot/feet

L_{eq} = equivalent continuous sound level

EXISTING AIRCRAFT NOISE

Aircraft flyovers may be audible on the project site due to aircraft activity in the vicinity. The nearest airport to the project is Hemet-Ryan Airport (HMT), an airport approximately 1 mile to the west. The project site is outside the 65 dBA CNEL airport noise impact zone, consistent with Figure 6.8 of the City’s Public Safety Element. Because the project site is outside the 65 dBA CNEL noise contour, no further analysis associated with aircraft noise impacts is necessary.



LSA

LEGEND

- Project Site Boundary
- LT-1 Long-Term Noise Monitoring Location

FIGURE 3



SOURCE: Google Earth 2021

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Kirby Street Warehouse
Noise Monitoring Locations

EXISTING RAIL ACTIVITY NOISE

As shown in Table H, above, the exterior noise level at the LT-3 location, representing the southern section of the project site, was recorded at 51.5 dBA CNEL. Because the office use portion of the proposed buildings would be farther to the east and north, noise impacts from the adjacent rail line would decrease and remain below 65 dBA CNEL. Because the areas of the project containing office uses would remain below 65 dBA CNEL, the project would comply with the applicable CALGreen Code standards and no further analysis associated with on-site rail noise impacts is necessary.

PROJECT IMPACTS

SHORT-TERM CONSTRUCTION NOISE IMPACTS

Two types of short-term noise impacts could occur during the construction of the proposed project. First, construction crew commutes and the transport of construction equipment and materials to the site for the proposed project would incrementally increase noise levels on access roads leading to the site. Although there would be a relatively high single-event noise-exposure potential causing intermittent noise nuisance (passing trucks at 50 ft would generate up to 84 dBA L_{max}), the effect on longer-term ambient noise levels would be small when compared to existing daily traffic volumes on Kirby Street. The results of the California Emissions Estimator Model (CalEEMod) for the proposed project indicate that during the building construction phase, an additional 1,994 vehicles, consisting of worker and hauling trips, would be added to the roadway adjacent to the project site. Because the existing traffic volume on Kirby Street is considerably more than 1,994, construction-related vehicle trips would not approach existing daily traffic volumes and traffic noise would not increase by 3 dBA CNEL. A noise level increase of less than 3 dBA would not be perceptible to the human ear in an outdoor environment. Therefore, short-term, construction-related impacts associated with worker commute and equipment transport to the project site would be less than significant.

The second type of short-term noise impact is related to noise generated during construction, which includes site preparation, grading, building construction, paving, and architectural coating on the project site. Construction is completed in discrete steps, each of which has its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise generated on the site and, therefore, the noise levels surrounding the site as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase. Table I lists typical construction equipment noise levels recommended for noise impact assessments, based on a distance of 50 ft between the equipment and a noise receptor, taken from the FHWA *Roadway Construction Noise Model* (FHWA 2006).

In addition to the reference maximum noise level, the usage factor provided in Table I is used to calculate the hourly noise level impact for each piece of equipment based on the following equation:

$$L_{eq}(equip) = E.L. + 10 \log(U.F.) - 20 \log\left(\frac{D}{50}\right)$$

where: $L_{eq}(equip)$ = L_{eq} at a receiver resulting from the operation of a single piece of equipment over a specified time period.

E.L. = noise emission level of the particular piece of equipment at a reference distance of 50 ft.

U.F. = usage factor that accounts for the fraction of time that the equipment is in use over the specified period of time.

D = distance from the receiver to the piece of equipment.

Table I: Typical Construction Equipment Noise Levels

Equipment Description	Acoustical Usage Factor (%) ¹	Maximum Noise Level (L _{max}) at 50 Feet ²
Auger Drill Rig	20	84
Backhoes	40	80
Compactor (ground)	20	80
Compressor	40	80
Cranes	16	85
Dozers	40	85
Dump Trucks	40	84
Excavators	40	85
Flat Bed Trucks	40	84
Forklift	20	85
Front-end Loaders	40	80
Graders	40	85
Impact Pile Drivers	20	95
Jackhammers	20	85
Paver	50	77
Pickup Truck	40	55
Pneumatic Tools	50	85
Pumps	50	77
Rock Drills	20	85
Rollers	20	85
Scrapers	40	85
Tractors	40	84
Trencher	50	80
Welder	40	73

Source: FHWA Roadway Construction Noise Model User’s Guide, Table 1 (FHWA 2006).

Note: Noise levels reported in this table are rounded to the nearest whole number.

¹ Usage factor is the percentage of time during a construction noise operation that a piece of construction equipment is operating at full power.

² Maximum noise levels were developed based on Specification 721.560 from the Central Artery/Tunnel program to be consistent with the City of Boston’s Noise Code for the “Big Dig” project.

FHWA = Federal Highway Administration

L_{max} = maximum instantaneous sound level

Each piece of construction equipment operates as an individual point source. Using the following equation, a composite noise level can be calculated when multiple sources of noise operate simultaneously:

$$Leq (composite) = 10 * \log_{10} \left(\sum_{1}^n 10^{\frac{Ln}{10}} \right)$$

Using the equations from the methodology above, the reference information in Table I, and the construction equipment list provided, the composite noise level of each construction phase was calculated. The project construction composite noise levels at a distance of 50 ft would range from 74 dBA L_{eq} to 88 dBA L_{eq}, with the highest noise levels occurring during the site preparation and grading phases.

Once composite noise levels are calculated, reference noise levels can then be adjusted for distance using the following equation:

$$Leq \text{ (at distance } X) = Leq \text{ (at 50 feet)} - 20 * \log_{10} \left(\frac{X}{50} \right)$$

In general, this equation shows that doubling the distance would decrease noise levels by 6 dBA while halving the distance would increase noise levels by 6 dBA.

Table J shows the nearest sensitive uses to the project site, their distance from the center of construction activities, and composite noise levels expected during construction. These noise level projections do not consider intervening topography or barriers. Construction equipment calculations are provided in Appendix B.

Table J: Potential Construction Noise Impacts at Nearest Receptor

Receptor (Location)	Composite Noise Level at 50 feet ¹ (dBA L _{eq})	Distance from Center of Construction Activities (feet)	Composite Noise Level (dBA L _{eq})
Residence (East)	88	550	68
Residence (Southeast)		890	63
Residence (South)		1160	61
Residence (North)		1560	59

Source: Compiled by LSA (2023).

¹ The composite construction noise level represents the site preparation and grading phases which are expected to result in the greatest noise level as compared to other phases.

dBA L_{eq} = average A-weighted hourly noise level

While construction noise will vary, it is expected that composite noise levels during construction at the nearest sensitive residential uses to the east would reach 68 dBA L_{eq} during daytime hours. These predicted noise levels would only occur when all construction equipment is operating simultaneously and, therefore, are assumed to be rather conservative in nature. While construction-related short-term noise levels have the potential to be higher than existing ambient noise levels in the project area under existing conditions, the noise impacts would no longer occur once project construction is completed.

As stated above, the City’s Noise Ordinance regulates noise impacts associated with construction activities. The proposed project would comply with the construction hours specified in the City’s Noise Ordinance, which states that construction activities are allowed between the hours of 6:00 a.m. and 6:00 p.m. during the months of June through September and between the hours of 7:00 a.m. and 6:00 p.m. during the months of October through May.

As it relates to off-site uses, construction-related noise impacts would remain below the 80 dBA L_{eq} 1-hour construction noise level criteria for daytime construction noise level criteria as established by the FTA for residential uses; therefore, the impact would be considered less than significant.

SHORT-TERM CONSTRUCTION VIBRATION IMPACTS

This construction vibration impact analysis discusses the level of human annoyance using vibration levels in RMS (VdB) and assesses the potential for building damages using vibration levels in PPV (in/sec). This is because vibration levels calculated in RMS are best for characterizing human response to building vibration, while vibration levels calculated in PPV are best for characterizing potential for damage.

Table K shows the PPV and VdB values at 25 ft from the construction vibration source. As shown in Table K, bulldozers, and other heavy-tracked construction equipment (expected to be used for this project) generate approximately 0.089 PPV in/sec or 87 VdB of ground-borne vibration when measured at 25 ft, based on the FTA Manual. The distance to the nearest buildings for vibration impact analysis is measured between the nearest off-site buildings and the project construction boundary (assuming the construction equipment would be used at or near the project setback line).

Table K: Vibration Source Amplitudes for Construction Equipment

Equipment	Reference PPV/L _v at 25 ft	
	PPV (in/sec)	L _v (VdB) ¹
Pile Driver (Impact), Typical	0.644	104
Pile Driver (Sonic), Typical	0.170	93
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large Bulldozer²	0.089	87
Caisson Drilling	0.089	87
Loaded Trucks²	0.076	86
Jackhammer	0.035	79
Small Bulldozer	0.003	58

Source: *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018).

¹ RMS vibration velocity in decibels (VdB) is 1 μin/sec.

² Equipment shown in **bold** is expected to be used on site.

μin/sec = microinches per second

ft = foot/feet

FTA = Federal Transit Administration

in/sec = inch/inches per second

L_v = velocity in decibels

PPV = peak particle velocity

RMS = root-mean-square

VdB = vibration velocity decibels

The formulae for vibration transmission are provided below, and Tables L and M, below, provide a summary of off-site construction vibration levels.

$$L_{v\text{dB}}(D) = L_{v\text{dB}}(25 \text{ ft}) - 30 \text{ Log}(D/25)$$

$$PPV_{\text{equip}} = PPV_{\text{ref}} \times (25/D)^{1.5}$$

As shown in Table F, above, the threshold at which vibration levels would result in annoyance would be 78 VdB for daytime residential uses. As shown in Table G, the FTA guidelines indicate that for a non-engineered timber and masonry building, the construction vibration damage criterion is 0.2 in/sec in PPV.

Table L: Potential Construction Vibration Annoyance Impacts at Nearest Receptor

Receptor (Location)	Reference Vibration Level (VdB) at 25 ft ¹	Distance (ft) ²	Vibration Level (VdB)
Residence (East)	87	550	47
Residence (Southeast)		890	40
Residence (South)		1160	37
Residence (North)		1560	33

Source: Compiled by LSA (2023).

¹ The reference vibration level is associated with a large bulldozer, which is expected to be representative of the heavy equipment used during construction.

² The reference distance is associated with the average condition, identified by the distance from the center of construction activities to surrounding uses.

ft = foot/feet

VdB = vibration velocity decibels

Table M: Potential Construction Vibration Damage Impacts at Nearest Receptor

Receptor (Location)	Reference Vibration Level (PPV) at 25 ft ¹	Distance (ft) ²	Vibration Level (PPV)
Residence (East)	0.089	100	0.011
Residence (Southeast)		165	0.005
Residence (South)		230	0.003
Residence (North)		750	0.001

Source: Compiled by LSA (2023).

¹ The reference vibration level is associated with a large bulldozer, which is expected to be representative of the heavy equipment used during construction.

² The reference distance is associated with the peak condition, identified by the distance from the perimeter of construction activities to surrounding structures.

ft = foot/feet

PPV = peak particle velocity

Based on the information provided in Table L, vibration levels are expected to approach 47 VdB at the closest residence to the east and would not exceed the annoyance thresholds.

Based on the information provided in Table M, vibration levels are expected to approach 0.011 PPV in/sec at the nearest surrounding structures and would be below the 0.2 PPV in/sec damage threshold. Other building structures surrounding the project site are farther away and would experience further reduced vibration. The impact would be considered less than significant, and no construction vibration impacts would occur. No vibration reduction measures are required. Therefore, the incorporation of Mitigation Measure 4.11-5, presented in the MMRP EIR, would not be necessary for this project.

Because construction activities are regulated by the City’s Municipal Code, which states that construction activities are allowed between the hours of 6:00 a.m. and 6:00 p.m. during the months

of June through September and between the hours of 7:00 a.m. and 6:00 p.m. during the months of October through May, vibration impacts would not occur during the more sensitive nighttime hours.

LONG-TERM OFF-SITE TRAFFIC NOISE IMPACTS

The guidelines included in the FHWA Highway Traffic Noise Prediction Model (FHWA-RD-77 108) were used to evaluate highway traffic-related noise conditions along roadway segments in the project vicinity. This model requires various parameters, including traffic volumes, vehicle mix, vehicle speed, and roadway geometry, to compute typical equivalent noise levels during daytime, evening, and nighttime hours. The resultant noise levels are weighted and summed over 24-hour periods to determine the CNEL values. Table N provides the traffic noise levels for the opening year with and without project scenarios. These noise levels represent the worst-case scenario, which assumes no shielding is provided between the traffic and the location where the noise contours are drawn.

The without and with project scenario traffic volumes were obtained from the *Traffic Impact Analysis for Kirby Street Warehouse Project* (EPD Solutions Inc. 2023). Appendix C provides the specific assumptions used in developing these noise levels and model printouts. Table N shows that the increase in project-related traffic noise would be no greater than 0.4 dBA. Noise level increases less than 1.0 dBA are not perceptible to the human ear. Therefore, traffic noise impacts from project-related traffic on off-site sensitive receptors would be less than significant and no mitigation measures are required.

LONG-TERM TRAFFIC-RELATED VIBRATION IMPACTS

The proposed project would not generate vibration levels related to on-site operations. In addition, vibration levels generated from project-related traffic on the adjacent roadways are unusual for on-road vehicles because the rubber tires and suspension systems of on-road vehicles provide vibration isolation. Based on a reference vibration level of 0.076 in/sec PPV, structures greater than 20 ft from the roadways that contain project trips would experience vibration levels below the most conservative standard of 0.12 in/sec PPV; therefore, vibration levels generated from project-related traffic on the adjacent roadways would be less than significant, and no mitigation measures are required.

LONG-TERM OFF-SITE STATIONARY NOISE IMPACTS

Adjacent off-site land uses would be potentially exposed to stationary-source noise impacts from the proposed on-site heating, ventilation, and air conditioning (HVAC) equipment, and truck deliveries and loading and unloading activities. The potential noise impacts to off-site sensitive land uses from the proposed operational activities are discussed below. To provide a conservative analysis, it is assumed that operations would occur equally during all daytime hours of the day and that half the 132 loading docks would be active at all times. During nighttime hours, it is assumed that half of the loading docks on the west side would be active, while one-quarter of the loading docks on the east side would be active. Additionally, it is assumed that within any given hour, 10 heavy trucks would maneuver to park near or back into one of the proposed loading docks. To determine the future noise impacts from project operations to the noise sensitive uses, a 3-D noise model, SoundPLAN, was used to incorporate the site topography as well as the shielding from

Table N: Traffic Noise Levels Without and With Proposed Project—Cumulative

Roadway Segment	Cumulative Without Whittier Avenue – Without Project		Cumulative Without Whittier Avenue – With Project			Cumulative With Whittier Avenue – Without Project		Cumulative With Whittier Avenue – With Project		
	ADT	CNEL (dBA) 50 ft from Centerline of Nearest Lane	ADT	CNEL (dBA) 50 ft from Centerline of Nearest Lane	Increase from Existing Conditions (dBA)	ADT	CNEL (dBA) 50 ft from Centerline of Nearest Lane	ADT	CNEL (dBA) 50 ft from Centerline of Nearest Lane	Increase from Existing Conditions (dBA)
Acacia Avenue west of Sanderson Avenue	7,600	63.2	8,060	63.5	0.3	7,600	63.2	7,600	63.5	0.0
Acacia Avenue east of Sanderson Avenue	12,500	65.0	12,960	65.2	0.2	12,500	65.0	12,500	65.2	0.0
Sanderson Avenue north of Acacia Avenue	24,380	64.3	24,380	64.3	0.0	24,380	64.3	24,920	64.3	0.1
Sanderson Avenue south of Acacia Avenue	25,450	67.8	25,450	67.8	0.0	25,450	67.8	25,990	67.8	0.1
Acacia Avenue east of Kirby Street	12,010	65.2	12,320	65.3	0.1	12,010	65.2	12,320	65.3	0.1
Kirby Street north of Acacia Avenue	12,900	63.4	13,340	63.6	0.2	12,900	63.3	13,260	63.6	0.1
Kirby Street south of Acacia Avenue	12,370	63.2	13,580	63.6	0.4	12,370	63.1	13,040	63.6	0.3
Stetson Avenue east of Kirby Street	21,460	68.0	21,640	68.1	0.1	21,460	68.0	21,640	68.1	0.1
Stetson Avenue west of Kirby Street	24,500	68.6	24,800	68.7	0.1	24,500	68.6	24,800	68.7	0.1
Stetson Avenue west of Sanderson Avenue	14,460	66.3	14,460	66.3	0.0	14,460	66.3	14,460	66.3	0.0

Source: Compiled by LSA (May 2023).

Note: Shaded cells indicate roadway segments adjacent to the project site.

ADT = average daily traffic

CNEL= Community Noise Equivalent Level

dBA = A-weighted decibels

ft = foot/feet

the proposed building on site, the proposed 14 ft high property line on the east, and the 8 ft high wall near the southwest corner gate. A graphic representation of the operational noise impacts is presented in Appendix D.

Heating, Ventilation, and Air Conditioning Equipment

The project would have various rooftop mechanical equipment, including HVAC units, on the proposed building. Based on the project site plan, the project is assumed to have six rooftop HVAC units and assumed to operate 24 hours per day. The HVAC equipment could operate 24 hours per day and would generate sound power levels (SPL) of up to 87 dBA SPL or 72 dBA L_{eq} at 5 ft, based on manufacturer data (Trane n.d.).

Trash Bin Emptying Activities

The project is estimated to have four trash dumpsters near each corner of the proposed building. The trash emptying activities would take place for a period less than 1 minute and would generate SPLs of up to 118.6 dBA SPL or 84 dBA L_{eq} at 50 ft, based on reference information within SoundPLAN. Trash bin emptying activities would only occur during daytime hours.

Truck Deliveries and Truck Loading and Unloading Activities

Noise levels generated by delivery trucks would be similar to noise readings from truck loading and unloading activities, which generate a noise level of 75 dBA L_{eq} at 20 ft based on measurements taken by LSA (*Operational Noise Impact Analysis for Richmond Wholesale Meat Distribution Center* [LSA 2016]). Shorter term noise levels that occur during the docking process taken by LSA were measured to be 76.3 dBA L_8 at 20 ft. Delivery trucks would arrive on site and maneuver their trailers so that trailers would be parked within the loading docks. During this process, noise levels are associated with the truck engine noise, air brakes, and back-up alarms while the truck is backing into the dock. These noise levels would occur for a shorter period of time (less than 5 minutes). After a truck enters the loading dock, the doors would be closed, and the remainder of the truck loading activities would be enclosed and therefore much less perceptible. To present a conservative assessment, it is assumed that truck arrivals and departure activities could occur at 10 spaces for a period of less than 5 minutes each and unloading activities could occur at 66 docks simultaneously for a period of more than 30 minutes in a given hour.

Cumulative Operations Noise Assessment

Tables O through R, below, show the combined hourly noise levels and maximum noise levels generated by HVAC equipment, trash bin emptying activities, and truck delivery activities at the closest off-site land uses.

The results in Tables O through R show that project-generated noise levels will not exceed the residential use daytime and nighttime noise standards at the receptors to the north, southeast, and southwest. Noise levels generated at the residential uses to the east will exceed the residential nighttime noise standards of 45 dBA L_{eq} and 65 dBA L_{max} at the closest sensitive uses to the east; however, project-generated noise levels would not generate a noise level increase of 3 dBA or more over the quietest ambient noise levels. Therefore, the impact would be less than significant, and no noise reduction measures are required.

Table O: Daytime Exterior Noise Level Impacts— L_{eq}

Receptor	Direction	Existing Quietest Daytime Noise Level (dBA L_{eq})	Project Generated Noise Levels (dBA L_{eq})	Potential Operational Noise Impact? ¹
RV Resort	North	69.6	46.4	No
Residence on Carmel Way	East	69.6	57.7	No
Residence on Garland Way	Southeast	66.7	48.7	No
Residence on Cypress Street	Southwest	42.8	43.6	No

Source: Compiled by LSA (2023).

¹ A potential operational noise impact would occur if (1) the quietest daytime ambient hour is less than 60 dBA L_{eq} and project noise impacts are greater than 60 dBA L_{eq} , OR (2) the quietest daytime ambient hour is greater than 60 dBA L_{eq} and project noise impacts are 3 dBA greater than the quietest daytime ambient hour.

dBA = A-weighted decibels

L_{eq} = equivalent continuous noise level

Table P: Nighttime Exterior Noise Level Impacts— L_{eq}

Receptor	Direction	Existing Quietest Nighttime Noise Level (dBA L_{eq})	Project Generated Noise Levels (dBA L_{eq})	Potential Operational Noise Impact? ¹
RV Resort	North	60.4	46.3	No
Residence on Carmel Way	East	60.4	54.8	No
Residence on Garland Way	Southeast	57.6	46.0	No
Residence on Cypress Street	Southwest	39.6	43.4	No

Source: Compiled by LSA (2023).

¹ A potential operational noise impact would occur if (1) the quietest nighttime ambient hour is less than 45 dBA L_{eq} and project noise impacts are greater than 45 dBA L_{eq} , OR (2) the quietest nighttime ambient hour is greater than 45 dBA L_{eq} and project noise impacts are 3 dBA greater than the quietest nighttime ambient hour.

dBA = A-weighted decibels

L_{eq} = equivalent continuous noise level

Table Q: Daytime Exterior Noise Level Impacts— L_{max}

Receptor	Direction	Existing Quietest Daytime Noise Level (dBA L_{max})	Project Generated Noise Levels (dBA L_{max})	Potential Operational Noise Impact? ¹
RV Resort	North	84.4	65.1	No
Residence on Carmel Way	East	84.4	70.3	No
Residence on Garland Way	Southeast	79.4	63.2	No
Residence on Cypress Street	Southwest	57.2	61.7	No

Source: Compiled by LSA (2023).

¹ A potential operational noise impact would occur if (1) the quietest daytime ambient maximum level is less than 75 dBA L_{max} and project noise impacts are greater than 75 dBA L_{max} , OR (2) the quietest daytime ambient maximum level is greater than 75 dBA L_{max} and project noise impacts are 3 dBA greater than the quietest daytime ambient maximum level.

dBA = A-weighted decibels

L_{max} = maximum instantaneous sound level

Table R: Nighttime Exterior Noise Level Impacts— L_{max}

Receptor	Direction	Existing Quietest Nighttime Noise Level (dBA L_{max})	Project Generated Noise Levels (dBA L_{max})	Potential Operational Noise Impact? ¹
RV Resort	North	80.4	63.6	No
Residence on Carmel Way	East	80.4	69.2	No
Residence on Garland Way	Southeast	74.6	58.1	No
Residence on Cypress Street	Southwest	52.9	58.6	No

Source: Compiled by LSA (2023).

¹ A potential operational noise impact would occur if (1) the quietest nighttime ambient maximum level is less than 65 dBA L_{max} and project noise impacts are greater than 65 dBA L_{max} , OR (2) the quietest nighttime ambient maximum level is greater than 65 dBA L_{max} and project noise impacts are 3 dBA greater than the quietest nighttime ambient maximum level.

dBA = A-weighted decibels

L_{max} = maximum instantaneous sound level

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APPENDIX A

NOISE MONITORING DATA

Noise Measurement Survey – 24 HR

Project Number: ESL2201.42
Project Name: Kirby Street

Test Personnel: Kevin Nguyendo
Equipment: Spark 706RC (SN:224)

Site Number: LT-1 Date: 1/17/23

Time: From 12:00 p.m. To 12:00 p.m.

Site Location: Located west of a single-family residence on 401 Carmel Way, Hemet, CA 92545 on a utility pole.

Primary Noise Sources: Vehicle traffic noise on Kirby Street.

Comments: _____

Photo:



Long-Term (24-Hour) Noise Level Measurement Results at LT-1

Start Time	Date	Noise Level (dBA)		
		L _{eq}	L _{max}	L _{min}
12:00 PM	1/17/23	74.5	84.4	44.8
1:00 PM	1/17/23	74.3	85.1	46.0
2:00 PM	1/17/23	74.5	85.3	49.0
3:00 PM	1/17/23	75.0	89.1	44.0
4:00 PM	1/17/23	75.1	86.9	51.6
5:00 PM	1/17/23	74.7	88.3	49.9
6:00 PM	1/17/23	73.2	85.3	48.3
7:00 PM	1/17/23	72.0	88.1	45.1
8:00 PM	1/17/23	70.5	85.5	44.0
9:00 PM	1/17/23	69.6	88.2	40.1
10:00 PM	1/17/23	67.5	86.8	40.6
11:00 PM	1/17/23	66.0	82.7	37.5
12:00 AM	1/18/23	62.7	82.9	36.4
1:00 AM	1/18/23	60.4	80.4	36.0
2:00 AM	1/18/23	62.5	83.0	35.3
3:00 AM	1/18/23	64.0	88.6	39.8
4:00 AM	1/18/23	66.8	88.1	40.1
5:00 AM	1/18/23	70.2	84.9	49.3
6:00 AM	1/18/23	71.5	85.3	49.6
7:00 AM	1/18/23	74.6	88.0	51.0
8:00 AM	1/18/23	74.1	86.0	46.9
9:00 AM	1/18/23	73.5	85.9	46.1
10:00 AM	1/18/23	73.8	88.0	45.8
11:00 AM	1/18/23	74.0	85.3	45.7

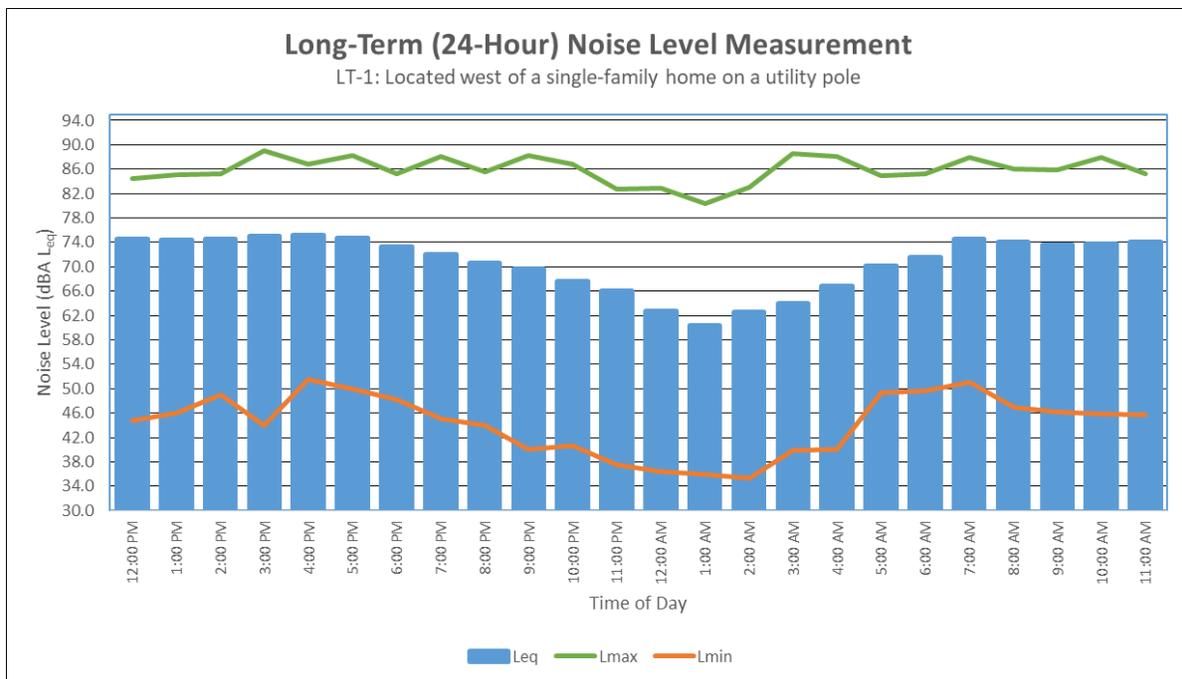
Source: Compiled by LSA Associates, Inc. (2022).

dBA = A-weighted decibel

L_{eq} = equivalent continuous sound level

L_{max} = maximum instantaneous noise level

L_{min} = minimum measured sound level



Noise Measurement Survey – 24 HR

Project Number: ESL2201.42
Project Name: Kirby Street

Test Personnel: Kevin Nguyendo
Equipment: Spark 706RC (SN:632)

Site Number: LT-2 Date: 1/17/23

Time: From 12:00 p.m. To 12:00 p.m.

Site Location: Located southwest of a single-family home on 591 Carmel Way, Hemet, CA 92545 on a utility pole.

Primary Noise Sources: Vehicle traffic noise on Kirby Street.

Comments: _____

Photo:



Long-Term (24-Hour) Noise Level Measurement Results at LT-2

Start Time	Date	Noise Level (dBA)		
		L _{eq}	L _{max}	L _{min}
12:00 PM	1/17/23	71.7	82.5	46.1
1:00 PM	1/17/23	71.2	85.5	45.2
2:00 PM	1/17/23	71.6	83.6	48.7
3:00 PM	1/17/23	72.0	81.3	45.3
4:00 PM	1/17/23	72.2	81.3	52.9
5:00 PM	1/17/23	72.0	82.8	51.5
6:00 PM	1/17/23	70.8	87.9	49.2
7:00 PM	1/17/23	69.4	80.1	49.3
8:00 PM	1/17/23	67.9	83.9	44.4
9:00 PM	1/17/23	66.7	84.9	43.1
10:00 PM	1/17/23	64.8	76.9	43.2
11:00 PM	1/17/23	63.4	77.4	42.9
12:00 AM	1/18/23	60.3	77.9	41.8
1:00 AM	1/18/23	57.6	74.6	41.7
2:00 AM	1/18/23	60.1	77.1	41.8
3:00 AM	1/18/23	61.4	85.0	42.7
4:00 AM	1/18/23	64.3	82.2	44.7
5:00 AM	1/18/23	67.7	81.5	49.1
6:00 AM	1/18/23	69.3	84.0	50.7
7:00 AM	1/18/23	71.9	79.4	53.8
8:00 AM	1/18/23	71.5	85.2	48.4
9:00 AM	1/18/23	70.8	84.1	43.6
10:00 AM	1/18/23	70.8	85.0	45.5
11:00 AM	1/18/23	71.0	85.5	46.3

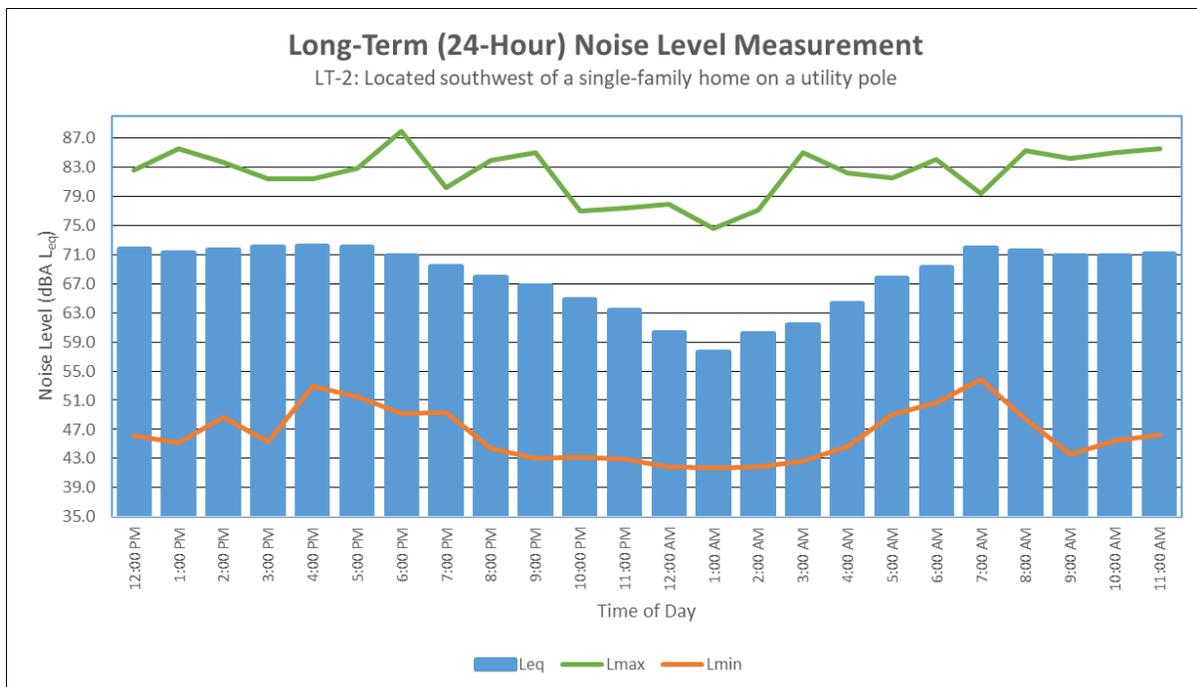
Source: Compiled by LSA Associates, Inc. (2022).

dBA = A-weighted decibel

L_{eq} = equivalent continuous sound level

L_{max} = maximum instantaneous noise level

L_{min} = minimum measured sound level



Noise Measurement Survey – 24 HR

Project Number: ESL2201.42
Project Name: Kirby Street

Test Personnel: Kevin Nguyendo
Equipment: Spark 706RC (SN:906)

Site Number: LT-3 Date: 1/17/23

Time: From 12:00 p.m. To 12:00 p.m.

Site Location: Located at the southwestern corner of the project site next to railroad tracks.

Primary Noise Sources: Faint chatting noise from the RV storage facility to the south.

Comments: _____

Photo:



Long-Term (24-Hour) Noise Level Measurement Results at LT-3

Start Time	Date	Noise Level (dBA)		
		L _{eq}	L _{max}	L _{min}
12:00 PM	1/17/23	44.4	63.2	36.9
1:00 PM	1/17/23	44.8	61.7	35.7
2:00 PM	1/17/23	44.8	62.5	35.5
3:00 PM	1/17/23	44.3	61.5	36.0
4:00 PM	1/17/23	45.2	59.9	36.8
5:00 PM	1/17/23	47.7	61.3	40.0
6:00 PM	1/17/23	45.5	61.7	39.2
7:00 PM	1/17/23	45.3	61.9	38.2
8:00 PM	1/17/23	42.8	57.2	37.9
9:00 PM	1/17/23	43.4	60.6	37.4
10:00 PM	1/17/23	44.6	61.9	36.9
11:00 PM	1/17/23	42.8	59.8	36.4
12:00 AM	1/18/23	45.2	62.1	36.1
1:00 AM	1/18/23	40.1	58.6	36.1
2:00 AM	1/18/23	39.9	52.9	36.1
3:00 AM	1/18/23	42.4	60.6	37.2
4:00 AM	1/18/23	44.9	53.1	37.6
5:00 AM	1/18/23	47.1	57.1	42.1
6:00 AM	1/18/23	48.8	57.2	44.0
7:00 AM	1/18/23	49.3	59.8	44.5
8:00 AM	1/18/23	44.9	62.7	38.5
9:00 AM	1/18/23	43.4	57.9	36.2
10:00 AM	1/18/23	43.6	60.6	35.4
11:00 AM	1/18/23	44.6	61.1	35.1

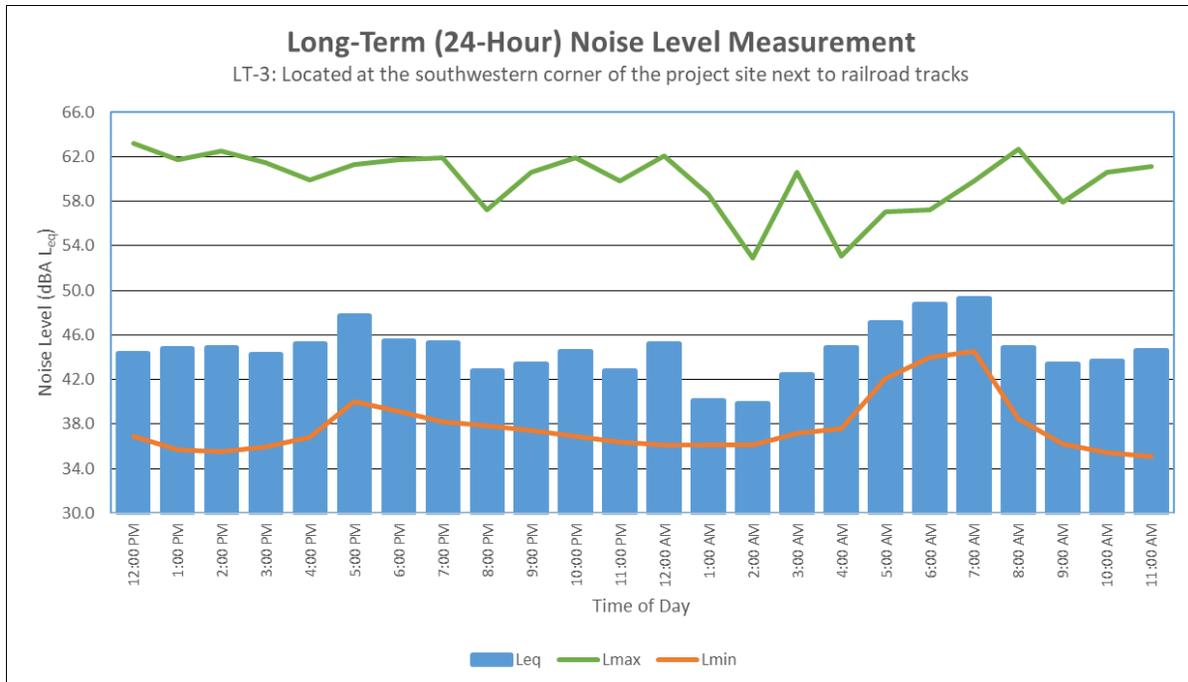
Source: Compiled by LSA Associates, Inc. (2022).

dBA = A-weighted decibel

L_{eq} = equivalent continuous sound level

L_{max} = maximum instantaneous noise level

L_{min} = minimum measured sound level



APPENDIX B

CONSTRUCTION NOISE LEVEL CALCULATIONS

Construction Calculations

Phase: Site Preparation

Equipment	Quantity	Reference (dBA) 50 ft Lmax	Usage Factor ¹	Distance to Receptor (ft)	Ground Effects	Noise Level (dBA)	
						Lmax	Leq
Tractor	4	84	40	50	0.5	84	86
Dozer	3	82	40	50	0.5	82	83
Combined at 50 feet						86	88
Combined at Receptor 550 feet						65	67

Phase: Grading

Equipment	Quantity	Reference (dBA) 50 ft Lmax	Usage Factor ¹	Distance to Receptor (ft)	Ground Effects	Noise Level (dBA)	
						Lmax	Leq
Grader	1	85	40	50	0.5	85	81
Scraper	2	84	40	50	0.5	84	83
Dozer	1	82	40	50	0.5	82	78
Tractor	2	84	40	50	0.5	84	83
Excavator	2	81	40	50	0.5	81	80
Combined at 50 feet						90	88
Combined at Receptor 550 feet						70	68
Combined at Receptor 890 feet						65	63
Combined at Receptor 1160 feet						63	61
Combined at Receptor 1560 feet						61	59

Phase: Building Construction

Equipment	Quantity	Reference (dBA) 50 ft Lmax	Usage Factor ¹	Distance to Receptor (ft)	Ground Effects	Noise Level (dBA)	
						Lmax	Leq
Crane	1	81	16	50	0.5	81	73
Man Lift	3	75	20	50	0.5	75	73
Generator	1	81	50	50	0.5	81	78
Tractor	3	84	40	50	0.5	84	85
Welder / Torch	1	74	40	50	0.5	74	70
Combined at 50 feet						87	86
Combined at Receptor 550 feet						67	65

Phase: Paving

Equipment	Quantity	Reference (dBA) 50 ft Lmax	Usage Factor ¹	Distance to Receptor (ft)	Ground Effects	Noise Level (dBA)	
						Lmax	Leq
Paver	2	77	50	50	0.5	77	77
All Other Equipment > 5 HP	2	85	50	50	0.5	85	85
Roller	2	80	20	50	0.5	80	76
Combined at 50 feet						87	86
Combined at Receptor 550 feet						66	65

Phase: Architectural Coating

Equipment	Quantity	Reference (dBA) 50 ft Lmax	Usage Factor ¹	Distance to Receptor (ft)	Ground Effects	Noise Level (dBA)	
						Lmax	Leq
Compressor (air)	1	78	40	50	0.5	78	74
Combined at 50 feet						78	74
Combined at Receptor 550 feet						57	53

Sources: RCNM

¹- Percentage of time that a piece of equipment is operating at full power.

dBA – A-weighted Decibels

Lmax- Maximum Level

Leq- Equivalent Level

APPENDIX C

FHWA TRAFFIC NOISE PRINTOUTS

TABLE Existing -01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
ROADWAY SEGMENT: Acacia Avenue West of Sanderson Avenue
NOTES: Kirby Street Industrial Project - Existing

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 7450 SPEED (MPH): 40 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
	---	-----	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 20 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.11

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
-----	-----	-----	-----
0.0	54.0	109.9	233.7

TABLE Existing -02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
ROADWAY SEGMENT: Acacia Avenue East of Sanderson Avenue
NOTES: Kirby Street Industrial Project - Existing

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 12260 SPEED (MPH): 40 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
	---	-----	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 25 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 64.93

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
-----	-----	-----	-----
0.0	74.3	152.7	325.4

TABLE Existing -03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
ROADWAY SEGMENT: Sanderson Avenue North of Acacia Avenue
NOTES: Kirby Street Industrial Project - Existing

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 22130 SPEED (MPH): 30 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
	---	-----	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 35 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.86

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
-----	-----	-----	-----
0.0	73.9	144.4	303.8

TABLE Existing -04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
ROADWAY SEGMENT: Sanderson Avenue South of Acacia Avenue
NOTES: Kirby Street Industrial Project - Existing

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 23200 SPEED (MPH): 40 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
	---	-----	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.38

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
-----	-----	-----	-----
0.0	111.0	232.2	497.0

TABLE Existing -05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
ROADWAY SEGMENT: Acacia Avenue East of Kirby Street
NOTES: Kirby Street Industrial Project - Existing

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 11770 SPEED (MPH): 40 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
	---	-----	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 20 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.10

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
-----	-----	-----	-----
0.0	71.0	148.0	316.5

TABLE Existing -06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
ROADWAY SEGMENT: Kirby Street North of Acacia Avenue
NOTES: Kirby Street Industrial Project - Existing

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 11870 SPEED (MPH): 35 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
	---	-----	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.05

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
-----	-----	-----	-----
0.0	62.6	122.2	256.9

TABLE Existing -07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
ROADWAY SEGMENT: Kirby Street South of Acacia Avenue
NOTES: Kirby Street Industrial Project - Existing

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 11360 SPEED (MPH): 35 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
	---	-----	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 62.86

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
-----	-----	-----	-----
0.0	61.3	118.9	249.6

TABLE Existing -08
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
ROADWAY SEGMENT: Stetson Avenue East of Kirby Street
NOTES: Kirby Street Industrial Project - Existing

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 18660 SPEED (MPH): 45 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
	---	-----	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 35 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.42

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
-----	-----	-----	-----
62.8	117.6	244.5	522.3

TABLE Existing -09
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
ROADWAY SEGMENT: Stetson Avenue West of Kirby Street
NOTES: Kirby Street Industrial Project - Existing

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 22050 SPEED (MPH): 45 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
	---	-----	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 35 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 68.15

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
-----	-----	-----	-----
68.0	130.3	272.7	583.5

TABLE Existing -10
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
ROADWAY SEGMENT: Stetson Avenue West of Sanderson Avenue
NOTES: Kirby Street Industrial Project - Existing

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 12340 SPEED (MPH): 45 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
	---	-----	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 35 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.63

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
-----	-----	-----	-----
0.0	92.2	187.0	397.2

TABLE Cumulative without Whittier Avenue
without Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
ROADWAY SEGMENT: Acacia Avenue West of Sanderson Avenue
NOTES: Kirby Street Industrial Project - Cumulative without Whittier Avenue without Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 7600 SPEED (MPH): 40 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
	---	-----	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 20 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.20

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
-----	-----	-----	-----
0.0	54.6	111.4	236.8

TABLE Cumulative without Whittier Avenue
without Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
ROADWAY SEGMENT: Acacia Avenue East of Sanderson Avenue
NOTES: Kirby Street Industrial Project - Cumulative without Whittier Avenue without Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 12500 SPEED (MPH): 40 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
	---	-----	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 25 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.01

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
-----	-----	-----	-----
0.0	75.1	154.6	329.6

TABLE Cumulative without Whittier Avenue
without Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
ROADWAY SEGMENT: Sanderson Avenue North of Acacia Avenue
NOTES: Kirby Street Industrial Project - Cumulative without Whittier Avenue without Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 24380 SPEED (MPH): 30 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
	---	-----	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 35 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 64.28

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
-----	-----	-----	-----
0.0	77.7	153.5	323.8

TABLE Cumulative without Whittier Avenue
without Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
ROADWAY SEGMENT: Sanderson Avenue South of Acacia Avenue
NOTES: Kirby Street Industrial Project - Cumulative without Whittier Avenue without Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 25450 SPEED (MPH): 40 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
	---	-----	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.79

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
-----	-----	-----	-----
60.7	117.6	246.7	528.4

TABLE Cumulative without Whittier Avenue
without Project-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
ROADWAY SEGMENT: Acacia Avenue East of Kirby Street
NOTES: Kirby Street Industrial Project - Cumulative without Whittier Avenue without Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 12010 SPEED (MPH): 40 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
	---	-----	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 20 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.19

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
-----	-----	-----	-----
0.0	71.8	150.0	320.7

TABLE Cumulative without Whittier Avenue
without Project-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
ROADWAY SEGMENT: Kirby Street North of Acacia Avenue
NOTES: Kirby Street Industrial Project - Cumulative without Whittier Avenue without Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 12900 SPEED (MPH): 35 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
	---	-----	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.42

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
-----	-----	-----	-----
0.0	65.4	128.8	271.4

TABLE Cumulative without Whittier Avenue
without Project-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
ROADWAY SEGMENT: Kirby Street South of Acacia Avenue
NOTES: Kirby Street Industrial Project - Cumulative without Whittier Avenue without Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 12370 SPEED (MPH): 35 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
	---	-----	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.23

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
-----	-----	-----	-----
0.0	64.0	125.4	264.0

TABLE Cumulative without Whittier Avenue
without Project-08
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
ROADWAY SEGMENT: Stetson Avenue East of Kirby Street
NOTES: Kirby Street Industrial Project - Cumulative without Whittier Avenue without Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 21460 SPEED (MPH): 45 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
	---	-----	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 35 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 68.03

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
-----	-----	-----	-----
67.1	128.2	267.9	573.1

TABLE Cumulative without Whittier Avenue
without Project-09
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
ROADWAY SEGMENT: Stetson Avenue West of Kirby Street
NOTES: Kirby Street Industrial Project - Cumulative without Whittier Avenue without Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 24500 SPEED (MPH): 45 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
	---	-----	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 35 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 68.61

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
-----	-----	-----	-----
71.6	139.1	292.2	625.8

TABLE Cumulative without Whittier Avenue
without Project-10
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
ROADWAY SEGMENT: Stetson Avenue West of Sanderson Avenue
NOTES: Kirby Street Industrial Project - Cumulative without Whittier Avenue without Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 14460 SPEED (MPH): 45 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
	---	-----	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 35 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.32

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
-----	-----	-----	-----
0.0	101.0	207.1	441.1

TABLE Cumulative without Whittier Avenue
with Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
ROADWAY SEGMENT: Acacia Avenue West of Sanderson Avenue
NOTES: Kirby Street Industrial Project - Cumulative without Whittier Avenue with Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 8060 SPEED (MPH): 40 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
	---	-----	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 20 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.45

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
-----	-----	-----	-----
0.0	56.5	115.7	246.2

TABLE Cumulative without Whittier Avenue
with Project-02

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023

ROADWAY SEGMENT: Acacia Avenue East of Sanderson Avenue

NOTES: Kirby Street Industrial Project - Cumulative without Whittier Avenue with Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 12960 SPEED (MPH): 40 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY ---	EVENING -----	NIGHT -----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 25 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.17

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL -----	65 CNEL -----	60 CNEL -----	55 CNEL -----
0.0	76.7	158.3	337.6

TABLE Cumulative without Whittier Avenue
with Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
ROADWAY SEGMENT: Sanderson Avenue North of Acacia Avenue
NOTES: Kirby Street Industrial Project - Cumulative without Whittier Avenue with Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 24380 SPEED (MPH): 30 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
	---	-----	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 35 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 64.28

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
-----	-----	-----	-----
0.0	77.7	153.5	323.8

TABLE Cumulative without Whittier Avenue
with Project-04

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023

ROADWAY SEGMENT: Sanderson Avenue South of Acacia Avenue

NOTES: Kirby Street Industrial Project - Cumulative without Whittier Avenue with Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 25450 SPEED (MPH): 40 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
	---	-----	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.79

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
-----	-----	-----	-----
60.7	117.6	246.7	528.4

TABLE Cumulative without Whittier Avenue
with Project-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
ROADWAY SEGMENT: Acacia Avenue East of Kirby Street
NOTES: Kirby Street Industrial Project - Cumulative without Whittier Avenue with Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 12320 SPEED (MPH): 40 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
	---	-----	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 20 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.30

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
-----	-----	-----	-----
0.0	73.0	152.5	326.2

TABLE Cumulative without Whittier Avenue
with Project-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
ROADWAY SEGMENT: Kirby Street North of Acacia Avenue
NOTES: Kirby Street Industrial Project - Cumulative without Whittier Avenue with Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 13340 SPEED (MPH): 35 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
	---	-----	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.56

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
-----	-----	-----	-----
0.0	66.6	131.5	277.5

TABLE Cumulative without Whittier Avenue
with Project-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
ROADWAY SEGMENT: Kirby Street South of Acacia Avenue
NOTES: Kirby Street Industrial Project - Cumulative without Whittier Avenue with Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 13580 SPEED (MPH): 35 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
	---	-----	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.64

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
-----	-----	-----	-----
0.0	67.2	133.0	280.7

TABLE Cumulative without Whittier Avenue
with Project-08
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
ROADWAY SEGMENT: Stetson Avenue East of Kirby Street
NOTES: Kirby Street Industrial Project - Cumulative without Whittier Avenue with Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 21640 SPEED (MPH): 45 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
	---	-----	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 35 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 68.07

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
-----	-----	-----	-----
67.4	128.8	269.3	576.3

TABLE Cumulative without Whittier Avenue
with Project-09
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
ROADWAY SEGMENT: Stetson Avenue West of Kirby Street
NOTES: Kirby Street Industrial Project - Cumulative without Whittier Avenue with Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 24800 SPEED (MPH): 45 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
	---	-----	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 35 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 68.66

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
-----	-----	-----	-----
72.1	140.2	294.5	630.9

TABLE Cumulative without Whittier Avenue
with Project-10
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
ROADWAY SEGMENT: Stetson Avenue West of Sanderson Avenue
NOTES: Kirby Street Industrial Project - Cumulative without Whittier Avenue with Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 14460 SPEED (MPH): 45 GRADE: .5

	TRAFFIC DISTRIBUTION PERCENTAGES		
	DAY	EVENING	NIGHT
	---	-----	-----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 35 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.32

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL	65 CNEL	60 CNEL	55 CNEL
-----	-----	-----	-----
0.0	101.0	207.1	441.1

TABLE Cumulative with Whittier
 Avenue without Project-01
 FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
 ROADWAY SEGMENT: Acacia Avenue West of Sanderson Avenue
 NOTES: Kirby Street Industrial Project - Cumulative with Whittier
 Avenue without Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 7600 SPEED (MPH): 40 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY ---	EVENING -----	NIGHT -----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 20 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.20

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL -----	65 CNEL -----	60 CNEL -----	55 CNEL -----
0.0	54.6	111.4	236.8

TABLE Cumulative with Whittier
 Avenue without Project-02
 FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
 ROADWAY SEGMENT: Acacia Avenue East of Sanderson Avenue
 NOTES: Kirby Street Industrial Project - Cumulative with Whittier
 Avenue without Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 12500 SPEED (MPH): 40 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY ---	EVENING -----	NIGHT -----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 25 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.01

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL -----	65 CNEL -----	60 CNEL -----	55 CNEL -----
0.0	75.1	154.6	329.6

TABLE Cumulative with Whittier
 Avenue without Project-03
 FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
 ROADWAY SEGMENT: Sanderson Avenue North of Acacia Avenue
 NOTES: Kirby Street Industrial Project - Cumulative with Whittier
 Avenue without Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 24380 SPEED (MPH): 30 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY ---	EVENING -----	NIGHT -----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 35 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 64.28

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL -----	65 CNEL -----	60 CNEL -----	55 CNEL -----
0.0	77.7	153.5	323.8

TABLE Cumulative with Whittier
 Avenue without Project-04
 FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
 ROADWAY SEGMENT: Sanderson Avenue South of Acacia Avenue
 NOTES: Kirby Street Industrial Project - Cumulative with Whittier
 Avenue without Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 25450 SPEED (MPH): 40 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY ---	EVENING -----	NIGHT -----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.79

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL -----	65 CNEL -----	60 CNEL -----	55 CNEL -----
60.7	117.6	246.7	528.4

TABLE Cumulative with Whittier
 Avenue without Project-05
 FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
 ROADWAY SEGMENT: Acacia Avenue East of Kirby Street
 NOTES: Kirby Street Industrial Project - Cumulative with Whittier
 Avenue without Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 12010 SPEED (MPH): 40 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY ---	EVENING -----	NIGHT -----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 20 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.19

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL -----	65 CNEL -----	60 CNEL -----	55 CNEL -----
0.0	71.8	150.0	320.7

TABLE Cumulative with Whittier
 Avenue without Project-06
 FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
 ROADWAY SEGMENT: Kirby Street North of Acacia Avenue
 NOTES: Kirby Street Industrial Project - Cumulative with Whittier
 Avenue without Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 12900 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY ---	EVENING -----	NIGHT -----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.42

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL -----	65 CNEL -----	60 CNEL -----	55 CNEL -----
0.0	65.4	128.8	271.4

TABLE Cumulative with Whittier
 Avenue without Project-07
 FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
 ROADWAY SEGMENT: Kirby Street South of Acacia Avenue
 NOTES: Kirby Street Industrial Project - Cumulative with Whittier
 Avenue without Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 12370 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY ---	EVENING -----	NIGHT -----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.23

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL -----	65 CNEL -----	60 CNEL -----	55 CNEL -----
0.0	64.0	125.4	264.0

TABLE Cumulative with Whittier
 Avenue without Project-08
 FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
 ROADWAY SEGMENT: Stetson Avenue East of Kirby Street
 NOTES: Kirby Street Industrial Project - Cumulative with Whittier
 Avenue without Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 21460 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY ---	EVENING -----	NIGHT -----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 35 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 68.03

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL -----	65 CNEL -----	60 CNEL -----	55 CNEL -----
67.1	128.2	267.9	573.1

TABLE Cumulative with Whittier
 Avenue without Project-09
 FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
 ROADWAY SEGMENT: Stetson Avenue West of Kirby Street
 NOTES: Kirby Street Industrial Project - Cumulative with Whittier
 Avenue without Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 24500 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY ---	EVENING -----	NIGHT -----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 35 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 68.61

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL -----	65 CNEL -----	60 CNEL -----	55 CNEL -----
71.6	139.1	292.2	625.8

TABLE Cumulative with Whittier
 Avenue without Project-10
 FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
 ROADWAY SEGMENT: Stetson Avenue West of Sanderson Avenue
 NOTES: Kirby Street Industrial Project - Cumulative with Whittier
 Avenue without Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 14460 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY ---	EVENING -----	NIGHT -----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 35 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.32

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL -----	65 CNEL -----	60 CNEL -----	55 CNEL -----
0.0	101.0	207.1	441.1

TABLE Cumulative with Whittier
 Avenue with Project-01
 FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
 ROADWAY SEGMENT: Acacia Avenue West of Sanderson Avenue
 NOTES: Kirby Street Industrial Project - Cumulative with Whittier
 Avenue with Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 7600 SPEED (MPH): 40 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY ---	EVENING -----	NIGHT -----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 20 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.20

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL -----	65 CNEL -----	60 CNEL -----	55 CNEL -----
0.0	54.6	111.4	236.8

TABLE Cumulative with Whittier
 Avenue with Project-02
 FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
 ROADWAY SEGMENT: Acacia Avenue East of Sanderson Avenue
 NOTES: Kirby Street Industrial Project - Cumulative with Whittier
 Avenue with Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 12500 SPEED (MPH): 40 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY ---	EVENING -----	NIGHT -----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 25 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.01

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL -----	65 CNEL -----	60 CNEL -----	55 CNEL -----
0.0	75.1	154.6	329.6

TABLE Cumulative with Whittier
 Avenue with Project-03
 FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
 ROADWAY SEGMENT: Sanderson Avenue North of Acacia Avenue
 NOTES: Kirby Street Industrial Project - Cumulative with Whittier
 Avenue with Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 24920 SPEED (MPH): 30 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY ---	EVENING -----	NIGHT -----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 35 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 64.38

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL -----	65 CNEL -----	60 CNEL -----	55 CNEL -----
0.0	78.6	155.6	328.5

TABLE Cumulative with Whittier
 Avenue with Project-04
 FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
 ROADWAY SEGMENT: Sanderson Avenue South of Acacia Avenue
 NOTES: Kirby Street Industrial Project - Cumulative with Whittier
 Avenue with Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 25990 SPEED (MPH): 40 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY ---	EVENING -----	NIGHT -----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.88

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL -----	65 CNEL -----	60 CNEL -----	55 CNEL -----
61.4	119.1	250.2	535.8

TABLE Cumulative with Whittier
 Avenue with Project-05
 FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
 ROADWAY SEGMENT: Acacia Avenue East of Kirby Street
 NOTES: Kirby Street Industrial Project - Cumulative with Whittier
 Avenue with Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 12320 SPEED (MPH): 40 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY ---	EVENING -----	NIGHT -----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 20 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 65.30

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL -----	65 CNEL -----	60 CNEL -----	55 CNEL -----
0.0	73.0	152.5	326.2

TABLE Cumulative with Whittier
 Avenue with Project-06
 FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
 ROADWAY SEGMENT: Kirby Street North of Acacia Avenue
 NOTES: Kirby Street Industrial Project - Cumulative with Whittier Avenue with Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 13260 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY ---	EVENING -----	NIGHT -----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.54

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL -----	65 CNEL -----	60 CNEL -----	55 CNEL -----
0.0	66.4	131.0	276.4

TABLE Cumulative with Whittier
 Avenue with Project-07
 FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
 ROADWAY SEGMENT: Kirby Street South of Acacia Avenue
 NOTES: Kirby Street Industrial Project - Cumulative with Whittier Avenue with Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 13040 SPEED (MPH): 35 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY ---	EVENING -----	NIGHT -----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 30 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 63.46

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL -----	65 CNEL -----	60 CNEL -----	55 CNEL -----
0.0	65.8	129.6	273.3

TABLE Cumulative with Whittier
 Avenue with Project-08
 FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
 ROADWAY SEGMENT: Stetson Avenue East of Kirby Street
 NOTES: Kirby Street Industrial Project - Cumulative with Whittier
 Avenue with Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 21640 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY ---	EVENING -----	NIGHT -----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 35 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 68.07

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL -----	65 CNEL -----	60 CNEL -----	55 CNEL -----
67.4	128.8	269.3	576.3

TABLE Cumulative with Whittier
 Avenue with Project-09
 FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
 ROADWAY SEGMENT: Stetson Avenue West of Kirby Street
 NOTES: Kirby Street Industrial Project - Cumulative with Whittier
 Avenue with Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 24800 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY ---	EVENING -----	NIGHT -----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 35 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 68.66

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL			
70 CNEL -----	65 CNEL -----	60 CNEL -----	55 CNEL -----
72.1	140.2	294.5	630.9

TABLE Cumulative with Whittier
 Avenue with Project-10
 FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 05/24/2023
 ROADWAY SEGMENT: Stetson Avenue West of Sanderson Avenue
 NOTES: Kirby Street Industrial Project - Cumulative with Whittier
 Avenue with Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 14460 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY ---	EVENING -----	NIGHT -----
AUTOS	75.51	12.57	9.34
M-TRUCKS	1.56	0.09	0.19
H-TRUCKS	0.64	0.02	0.08

ACTIVE HALF-WIDTH (FT): 35 SITE CHARACTERISTICS: SOFT

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.32

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL -----	65 CNEL -----	60 CNEL -----	55 CNEL -----
0.0	101.0	207.1	441.1

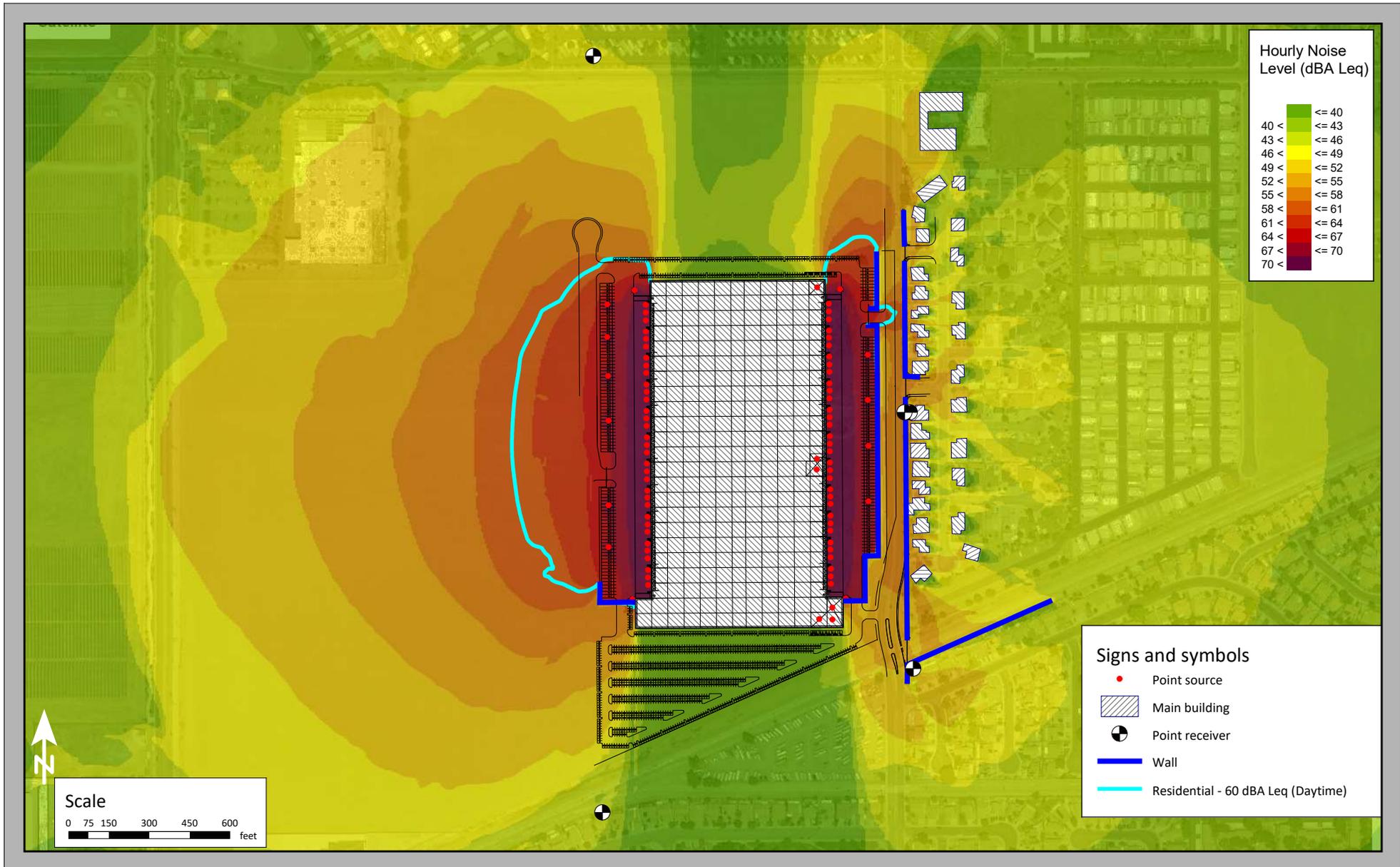
APPENDIX D

SOUNDPLAN NOISE MODEL PRINTOUTS

Kirby Street Warehouse

Project No. ESL2201.42

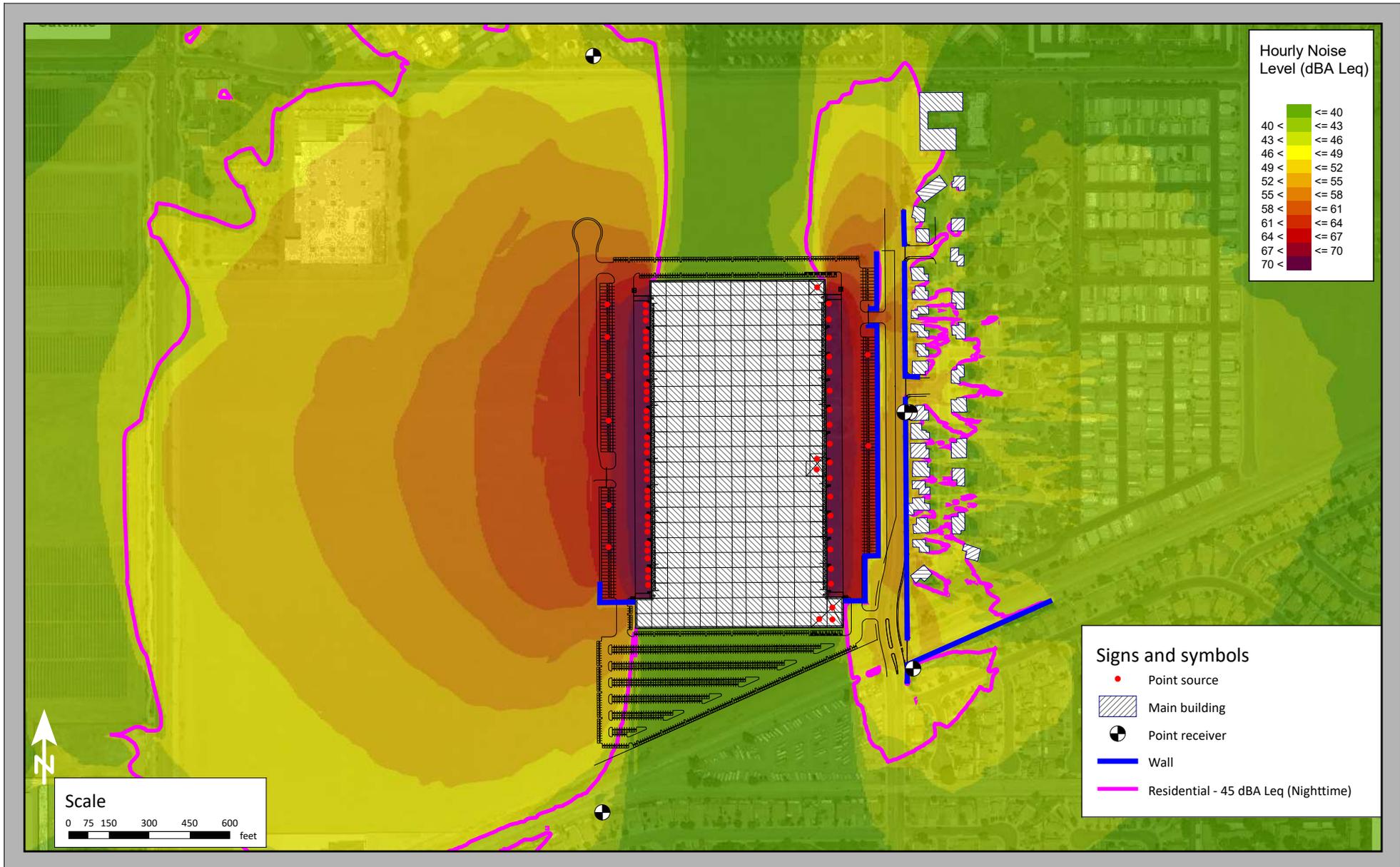
Project Operational Noise Levels - Day



Kirby Street Warehouse

Project No. ESL2201.42

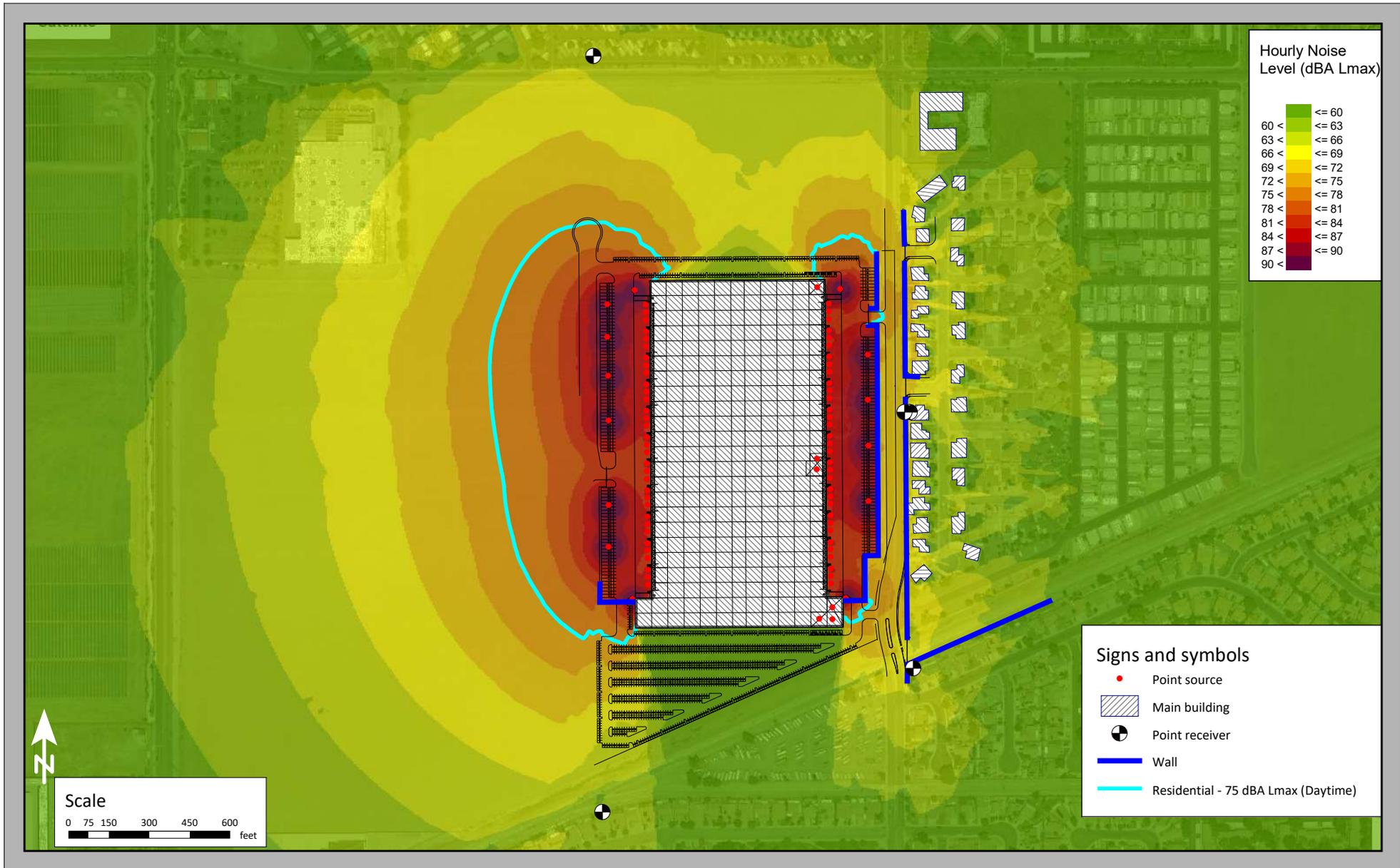
Project Operational Noise Levels - Night



Kirby Street Warehouse

Project No. ESL2201.42

Project Operational Noise Levels - Day



Kirby Street Warehouse

Project No. ESL2201.42

Project Operational Noise Levels - Night

