APPENDIX J

ACOUSTICAL ASSESSMENT

Acoustical Assessment
CADO Menifee Industrial Warehouse Project
City of Menifee, California

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LIST OF ABBREVIATED TERMS

ADT	average daily traffic
dBA	A-weighted sound level
CEQA	California Environmental Quality Act
CNEL	community equivalent noise level
L_{dn}	day-night noise level
dB	decibel
L_{eq}	equivalent noise level
FHWA	Federal Highway Administration
FT	feet
FTA	Federal Transit Administration
HVAC	heating ventilation and air conditioning
Hz	hertz
in/sec	inches per second
L_{max}	maximum noise level
µPa	micropascals
L_{min}	minimum noise level
PPV	peak particle velocity
RMS	root mean square
VdB	vibration velocity level

1 INTRODUCTION

This report documents the results of an Acoustical Assessment completed for the CADO Menifee Industrial Warehouse project (Project). The purpose of this Acoustical Assessment is to evaluate the potential construction and operational noise and vibration levels associated with the Project and determine the level of impact the Project would have on the environment.

1.1 Project Location

The Project site is located approximately 1.5 miles west of Interstate 215 (I-215) and approximately 3.0 miles south of State Route (SR) 74, within the City of Menifee (see Exhibit 1: Regional Vicinity Map). The Project is north of Corsica Lane, south of Kuffel Road, east of Wheat Street, and west of Byers Road, within the City. The Project site is located in the Economic Development Corridor- Northern Gateway (EDC-NG) of the City and is currently bordered by a scattering of existing rural residential homes (1-5 acres) and outbuildings, proposed future industrial sites, and vacant land (refer to Exhibit 2: Site Vicinity Map).

1.2 Project Description

The Project applicant proposes the development of approximately 700,037 square feet (SF) of industrial warehouse space (including office space) within one building on a total of 36.8 net acres (refer to Exhibit 3: Conceptual Site Plan). The proposed concrete tilt-up build would include approximately 690,037 SF of warehouse space and 10,000 SF of office space; approximating 700,037 total SF of development. The building would also contain 49 dock doors on the northern portion of the building and 49 dock doors on the southern portion of the building for a total of 98 dock doors. The Project would include 499 automobile parking spaces and 245 truck trailer parking spaces.

Project Circulation

Regional Project access would be from I-215 via the potential truck route, Ethanac Road.[1] Local access would be provided via Ethanac Road to Wheat Street or Byers Road.

Access to the Project site for both automobiles and trucks is proposed off the following:

- One 40-foot access driveway is on the northwest side of the building on Wheat Street.
- One 40-foot access driveway is on the southwest side of the building on Wheat Street.
- One 41.5-foot access driveway is on the northeast side of the building on Byers Road.
- One 40-foot access driveway is on the southeast side of the building on Byers Road.

Emergency vehicle access is provided around the building with a minimum 26-foot wide fire lane.

Offsite Improvements

The following street improvements are anticipated for the Industrial Collector Streets:

1 City of Menifee. 2013. Menifee General Plan Exhibit C-7: Potential Truck Routes. https://www.cityofmenifee.us/DocumentCenter/View/1024/C-7-Truck_Routes_HD0913?bidId= (accessed April 2022).

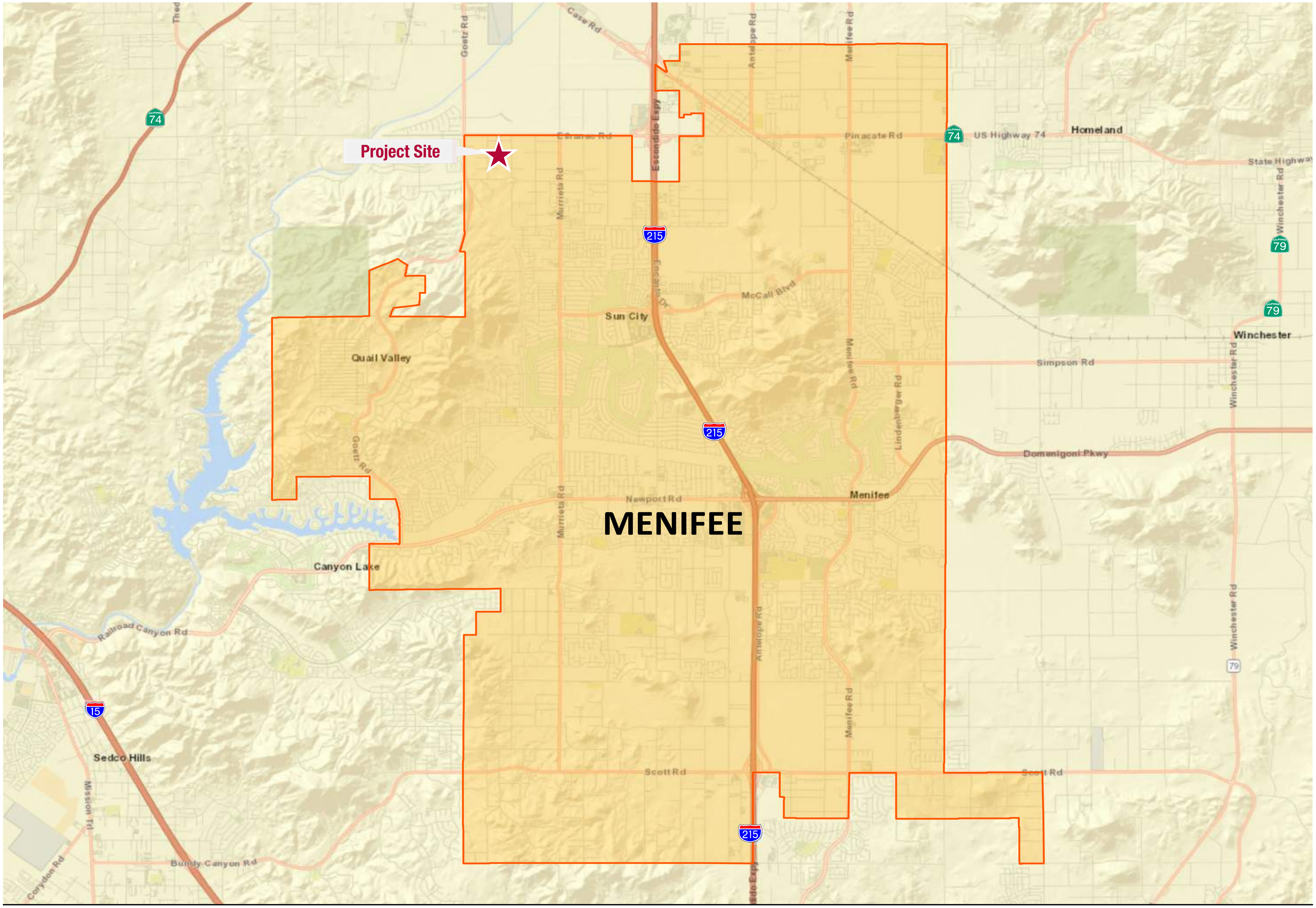
- Byers Road would serve as the north/south roadway for autos and trucks to and from the Project site. Improvements to Byers Road would include widening to a half-width plus 12 feet. The road would be paved and would include curb/gutter, sidewalk, and a landscaped parkway.
- Wheat Street would serve as the north/south roadway mainly for autos/employees to and from the Project site. Improvements to Wheat Street will include widening to a half-width plus 12 feet. The street will be paved and will include curb/gutter, sidewalk, and a landscaped parkway.

The following street improvements are anticipated for the General Local Road:

- Kuffel Road would serve as a west/east roadway. Improvements to Kuffel Road will include widening to a half-width plus 12 feet. The road will be paved and will include curb/gutter, sidewalk, and landscaping adjacent to the stormwater detention basin.

Project Phasing and Construction

The Project is anticipated to be developed in one phase. Construction for the Project is anticipated to occur over approximately 14 months, beginning in 2024. The Project would require 145,000 cubic yards (CYs) of soil fill (import).



Source: ESRI ArcGIS Pro.

Exhibit 1: Regional Vicinity Map

City of Menifee

CADO Project

Not to Scale

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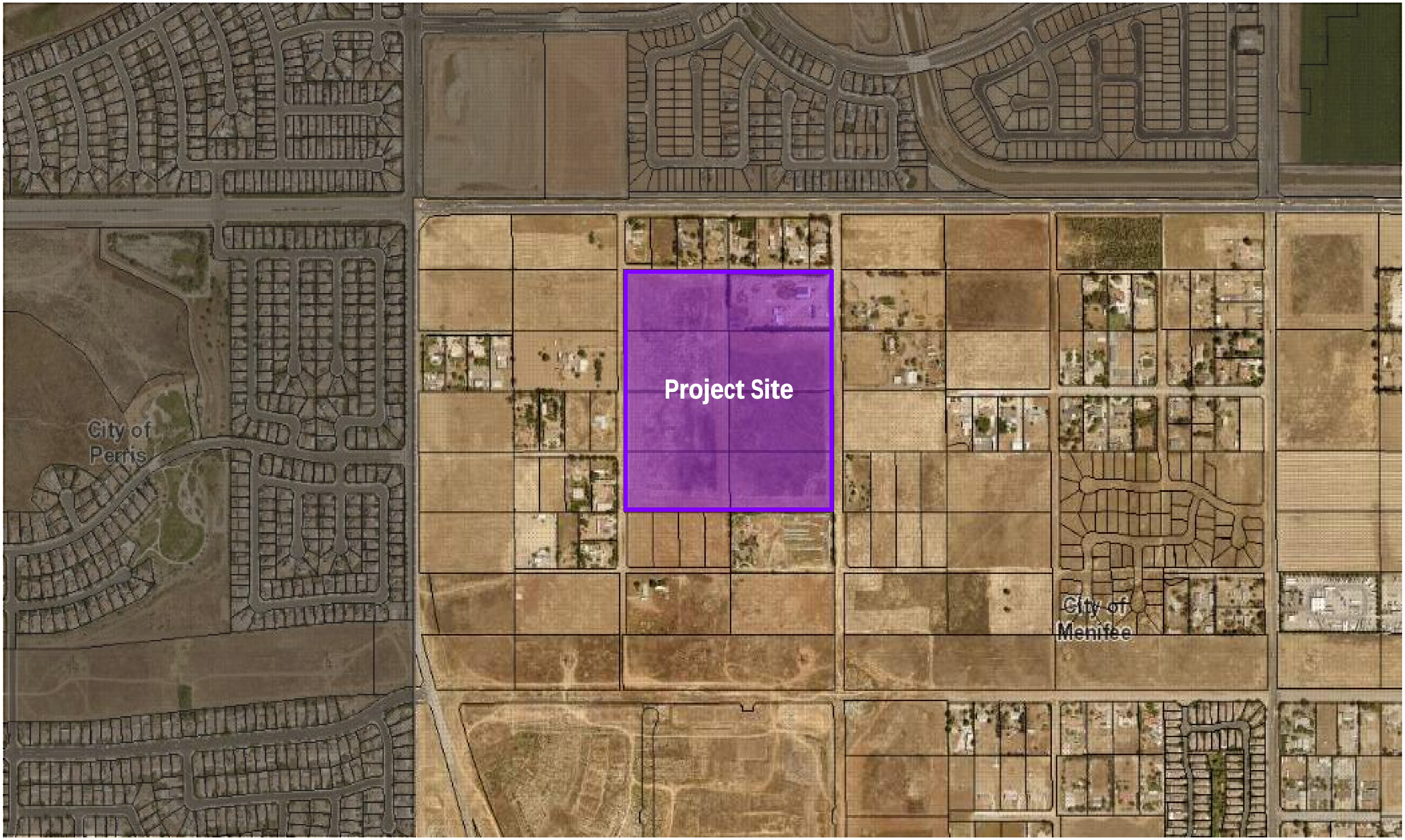

Source: ESRI ArcGIS Pro.

Exhibit 2: Site Vicinity Map
City of Menifee
CADO Project

Not to Scale

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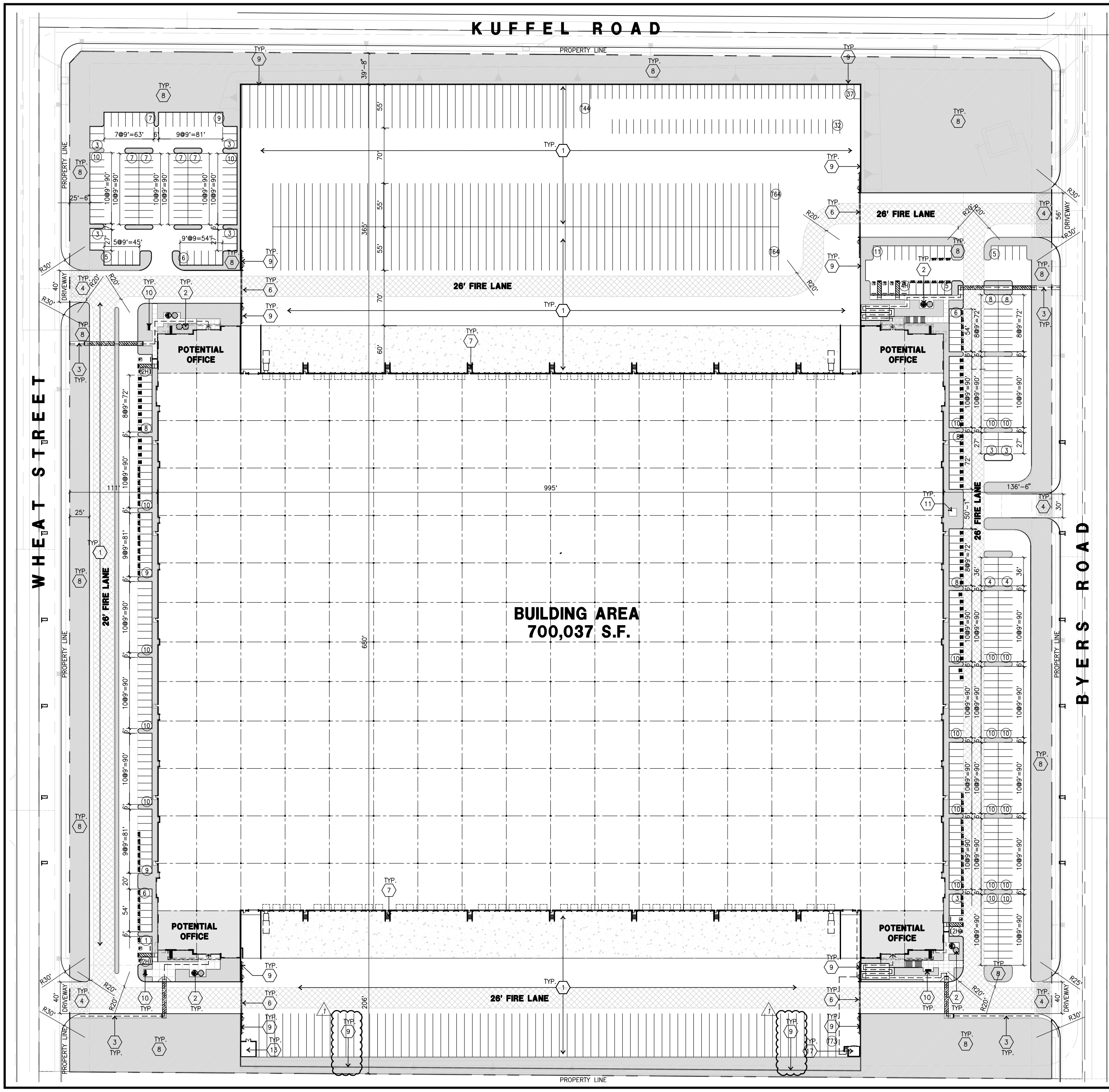

SITE AREA		
Gross		
In s.f.	1,743,706 s.f.	
In acres	40.03 ac	
Net		
In s.f.	1,603,443 s.f.	
In acres	36.81 ac	
BUILDING AREA		
Office	10,000 s.f.	
Warehouse	690,037 s.f.	
TOTAL	700,037 s.f.	
COVERAGE	40.1%	
AUTO PARKING REQUIRED		
Office: 1/250 s.f.		40 stalls
Whse: 1/2,000 s.f.		346 stalls
TOTAL		**386 stalls**
HANDICAP PARKING STALLS REQUIRED		**9 stalls**
Per CBC Table 11B-208.2, 401 to 500 parking spaces is required to provide 9 accessible parking spaces.		
ELECTRIC VEHICLE CHARGING SPACES REQUIRED		
10% of Total parking provided per CBC Table 5.106.5.3.3		**50 stalls**
CLEAR AIR VEHICLE PARKING REQUIRED		
12% of total parking provided per CGC Table 5.106.5.2		**60 stalls**
AUTO PARKING PROVIDED		
Standard (9' x 18')		379 stalls
Handicap (9'x18')		10 stalls
Clean Air/FEV/Carpool/Van Pool		60 stalls
EV Charging Parking Spaces		50 stalls
TOTAL		**499 stalls**
TRAILER PARKING PROVIDED		
Trailer (10' x 55')		245 stalls
ZONING ORDINANCE FOR CITY		
EDC-Northern Gatew ay Zone		
MAXIMUM BUILDING HEIGHT ALLOWED		
Height - 50', (100' Max)		
MAXIMUM FLOOR AREA RATIO		
FAR - 1.0		
LANDSCAPE OPEN SPACE REQUIRED		
10% OF TOTAL AREA EXCLUDING FRONT SET BACK AREA		
LANDSCAPE OPEN SPACE PROVIDED		
Area	162,886 s.f.	
Percentage	10.7%	
SETBACKS		
Front	25'	
Side	15'	
Rear	10'	

Source: HPA Architecture. (2023). Overall Site Plan

Exhibit 3: Conceptual Site Plan
City of Menifee
CADO Menifee Industrial Warehouse Project

Not to Scale

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2 ACOUSTIC FUNDAMENTALS

2.1 Sound and Environmental Noise

Acoustics is the science of sound. Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a medium (e.g. air) to human (or animal) ear. If the pressure variations occur frequently enough (at least 20 times per second), they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound and is expressed as cycles per second, or hertz (Hz).

Noise is defined as loud, unexpected, or annoying sound. In acoustics, the fundamental model consists of a noise source, a receptor, and the propagation path between the two. The loudness of the noise source, obstructions, or atmospheric factors affecting the propagation path, determine the perceived sound level and noise characteristics at the receptor. Acoustics deal primarily with the propagation and control of sound. A typical noise environment consists of a base of steady background noise that is the sum of many distant and indistinguishable noise sources. Superimposed on this background noise is the sound from individual local sources. These sources can vary from an occasional aircraft or train passing by to continuous noise from traffic on a major highway. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a large range of numbers. To avoid this, the decibel (dB) scale was devised. The dB scale uses the hearing threshold of 20 micropascals (µPa) as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The dB scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels correspond closely to human perception of relative loudness. Table 1: Typical Noise Levels provides typical noise levels.

Table 1: Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	– 110 –	Rock Band
Jet fly-over at 1,000 feet		
	– 100 –	
Gas lawnmower at 3 feet		
	– 90 –	
Diesel truck at 50 feet at 50 miles per hour		Food blender at 3 feet
	– 80 –	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawnmower, 100 feet	**– 70 –**	Vacuum cleaner at 10 feet
Commercial area		Normal Speech at 3 feet
Heavy traffic at 300 feet	**– 60 –**	
		Large business office
Quiet urban daytime	**– 50 –**	Dishwasher in next room
Quiet urban nighttime	**– 40 –**	Theater, large conference room (background)
Quiet suburban nighttime		
	– 30 –	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	– 20 –	
		Broadcast/recording studio
	– 10 –	
Lowest threshold of human hearing	**– 0 –**	Lowest threshold of human hearing

Source: California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, September 2013.

Noise Descriptors

The dB scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Several rating scales have been developed to analyze the adverse effect of community noise on people. Because environmental noise fluctuates over time, these scales consider that the effect of noise on people is largely dependent on the total acoustical energy content of the noise, as well as the time of day when the noise occurs. The equivalent noise level (L_{eq}) represents the continuous sound pressure level over the measurement period, while the day-night noise level (L_{dn}) and Community Equivalent Noise Level (CNEL) are measures of energy average during a 24-hour period, with dB weighted sound levels from 7:00 p.m. to 7:00 a.m. Most commonly, environmental sounds are described in terms of L_{eq} that has the same acoustical energy as the summation of all the time-varying events. Each is applicable to this analysis and defined in Table 2: Definitions of Acoustical Terms.

Table 2: Definitions of Acoustical Terms

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

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

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

A-Weighted Decibels

The perceived loudness of sounds is dependent on many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable and can be approximated by dBA values. There is a strong correlation between dBA and the way the human ear perceives sound. For this reason, the dBA has become the standard tool of environmental noise assessment. All noise levels reported in this document are in terms of dBA, but are expressed as dB, unless otherwise noted.

Addition of Decibels

The dB scale is logarithmic, not linear, and therefore sound levels cannot be added or subtracted through ordinary arithmetic. Two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic dB is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70-dBA sound is half as loud as an 80-dBA sound and twice as loud as a 60-dBA sound. When two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dBA higher than one source under the same conditions. Under the dB scale, three sources of equal loudness together would produce an increase of 5 dBA.

Sound Propagation and Attenuation

Sound spreads (propagates) uniformly outward in a spherical pattern, and the sound level decreases (attenuates) at a rate of approximately 6 dB for each doubling of distance from a stationary or point source. Sound from a line source, such as a highway, propagates outward in a cylindrical pattern. Sound levels attenuate at a rate of approximately 3 dB for each doubling of distance from a line source, such as a roadway, depending on ground surface characteristics. No excess attenuation is assumed for hard surfaces like a parking lot or a body of water. Soft surfaces, such as soft dirt or grass, can absorb sound, so an excess ground-attenuation value of 1.5 dB per doubling of distance is normally assumed. For line sources, an overall attenuation rate of 3 dB per doubling of distance is assumed.

Noise levels may also be reduced by intervening structures; generally, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm reduces noise levels by 5 to 10 dBA. The way older homes in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows. The exterior-to-interior reduction of newer residential units is generally 30 dBA or more.

Human Response to Noise

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

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

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

Effects of Noise on People

Hearing Loss. While physical damage to the ear from an intense noise impulse is rare, a degradation of auditory acuity can occur even within a community noise environment. Hearing loss occurs mainly due to chronic exposure to excessive noise but may be due to a single event such as an explosion. Natural hearing loss associated with aging may also be accelerated from chronic exposure to loud noise. The Occupational Safety and Health Administration has a noise exposure standard that is set at the noise threshold where hearing loss may occur from long-term exposures. The maximum allowable level is 90 dBA averaged over 8 hours. If the noise is above 90 dBA, the allowable exposure time is correspondingly shorter.

Annoyance. Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The L_{dn} as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources. A noise level of about 55 dBA L_{dn} is the threshold at which a substantial percentage of people begin to report annoyance[2].

2.2 Groundborne Vibration

Sources of groundborne vibrations include natural phenomena (earthquakes, volcanic eruptions, sea waves, landslides, etc.) or man-made causes (explosions, machinery, traffic, trains, construction equipment, etc.). Vibration sources may be continuous (e.g. factory machinery) or transient (e.g. explosions). Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One is the peak particle velocity (PPV); another is the root mean square (RMS) velocity. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. The RMS velocity is defined as the average of the squared amplitude of the signal. The PPV and RMS vibration velocity amplitudes are used to evaluate human response to vibration.

Table 3: Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibrations**,** displays the reactions of people and the effects on buildings produced by continuous vibration levels. The annoyance levels shown in the table should be interpreted with care since vibration may be found to be annoying at much lower levels than those listed, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. In high noise environments, which are more prevalent where groundborne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

Table 3: Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibrations

Maximum PPV (in/sec)	Vibration Annoyance Potential Criteria	Vibration Damage Potential Threshold Criteria	FTA Vibration Damage Criteria
0.008	--	Extremely fragile historic buildings, ruins, ancient monuments	--
0.01	Barely Perceptible	--	--
0.04	Distinctly Perceptible	--	--
0.1	Strongly Perceptible	Fragile buildings	--
0.12	--	--	Buildings extremely susceptible to vibration damage
0.2	--	--	Non-engineered timber and masonry buildings
0.25	--	Historic and some old buildings	--
0.3	--	Older residential structures	Engineered concrete and masonry (no plaster)
0.4	Severe	--	--
0.5	--	New residential structures, Modern industrial/commercial buildings	Reinforced-concrete, steel or timber (no plaster)

PPV = peak particle velocity; in/sec = inches per second; FTA = Federal Transit Administration

Source: California Department of Transportation, *Transportation and Construction Vibration Guidance Manual*, 2020 and Federal Transit administration, Transit Noise and Vibration Assessment Manual, 2018.

Ground vibration can be a concern in instances where buildings shake, and substantial rumblings occur. However, it is unusual for vibration from typical urban sources such as buses and heavy trucks to be perceptible. Common sources for groundborne vibration are planes, trains, and construction activities

2 Federal Interagency Committee on Noise, *Federal Agency Review of Selected Airport Noise Analysis Issues*, August 1992.

such as earth-moving which requires the use of heavy-duty earth moving equipment. For the purposes of this analysis, a PPV descriptor with units of inches per second (in/sec) is used to evaluate construction-generated vibration for building damage and human complaints.

3 REGULATORY SETTING

To limit population exposure to physically or psychologically damaging as well as intrusive noise levels, the Federal government, the State of California, various county governments, and most municipalities in the state have established standards and ordinances to control noise.

3.1 Federal

Federal Transit Administration Noise and Vibration Guidance

The Federal Transit Administration (FTA) has published the Transit Noise and Vibration Impact Assessment report to provide guidance on procedures for assessing impacts at different stages of transit project development. The report covers both construction and operational noise impacts and describes a range of measures for controlling excessive noise and vibration. The specified noise criteria are an earlier version of the criteria provided by the Federal Railroad Administration's High-Speed Ground Transportation Noise and Vibration Impact Assessment. In general, the primary concern regarding vibration relates to potential damage from construction. The guidance document establishes criteria for evaluating the potential for damage for various structural categories from vibration.

3.2 State of California

California Government Code

California Government Code Section 65302(f) mandates that the legislative body of each county and city adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines established by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of "normally acceptable", "conditionally acceptable", "normally unacceptable", and "clearly unacceptable" noise levels for various land use types. Single-family homes are "normally acceptable" in exterior noise environments up to 60 CNEL and "conditionally acceptable" up to 70 CNEL. Multiple-family residential uses are "normally acceptable" up to 65 CNEL and "conditionally acceptable" up to 70 CNEL. Schools, libraries, and churches are "normally acceptable" up to 70 CNEL, as are office buildings and business, commercial, and professional uses.

California Building Code - Title 24, Part 2

The State's noise insulation standards are codified in the California Code of Regulations, Title 24: Part 1, Building Standards Administrative Code, and Part 2, California Building Code. These noise standards are applied to new construction in California for interior noise compatibility from exterior noise sources. The regulations specify that acoustical studies must be prepared when noise-sensitive structures, such as residential buildings, schools, hotel rooms, or hospitals, are located near major transportation noise sources, and where such noise sources create an exterior noise level of 65 dBA CNEL or higher. Acoustical studies that accompany building plans must demonstrate that the structure has been designed to limit interior noise in habitable rooms to acceptable noise levels. For new multi-family residential buildings and habitable rooms (including hotels), the acceptable interior noise limit for new construction is 45 dBA CNEL.

3.3 Local

City of Menifee General Plan

The City of Menifee General Plan Noise Element contains the following goals and policies that address noise:

Noise Element N-1: Noise Sensitive Land Uses

Goal N-1: Noise-sensitive land uses are protected from excessive noise and vibration exposure.

Policies and Regulations:

- **N-1.1:** Assess the compatibility of proposed land uses with the noise environment when preparing, revising, or reviewing development project applications.
- **N-1.2:** Require new projects to comply with the noise standards of local, regional, and state building code regulations, including but not limited to the city's Municipal Code, Title 24 of the California Code of Regulations, the California Green Building Code, and subdivision and development codes.
- **N-1.3:** Require noise abatement measures to enforce compliance with any applicable regulatory mechanisms, including building codes and subdivision and zoning regulations, and ensure that the recommended mitigation measures are implemented.
- **N-1.7:** Mitigate exterior and interior noises to the levels listed in the table below to the extent feasible, for stationary sources adjacent to sensitive receptors:

Table 4: City of Menifee Stationary Source Noise Standards

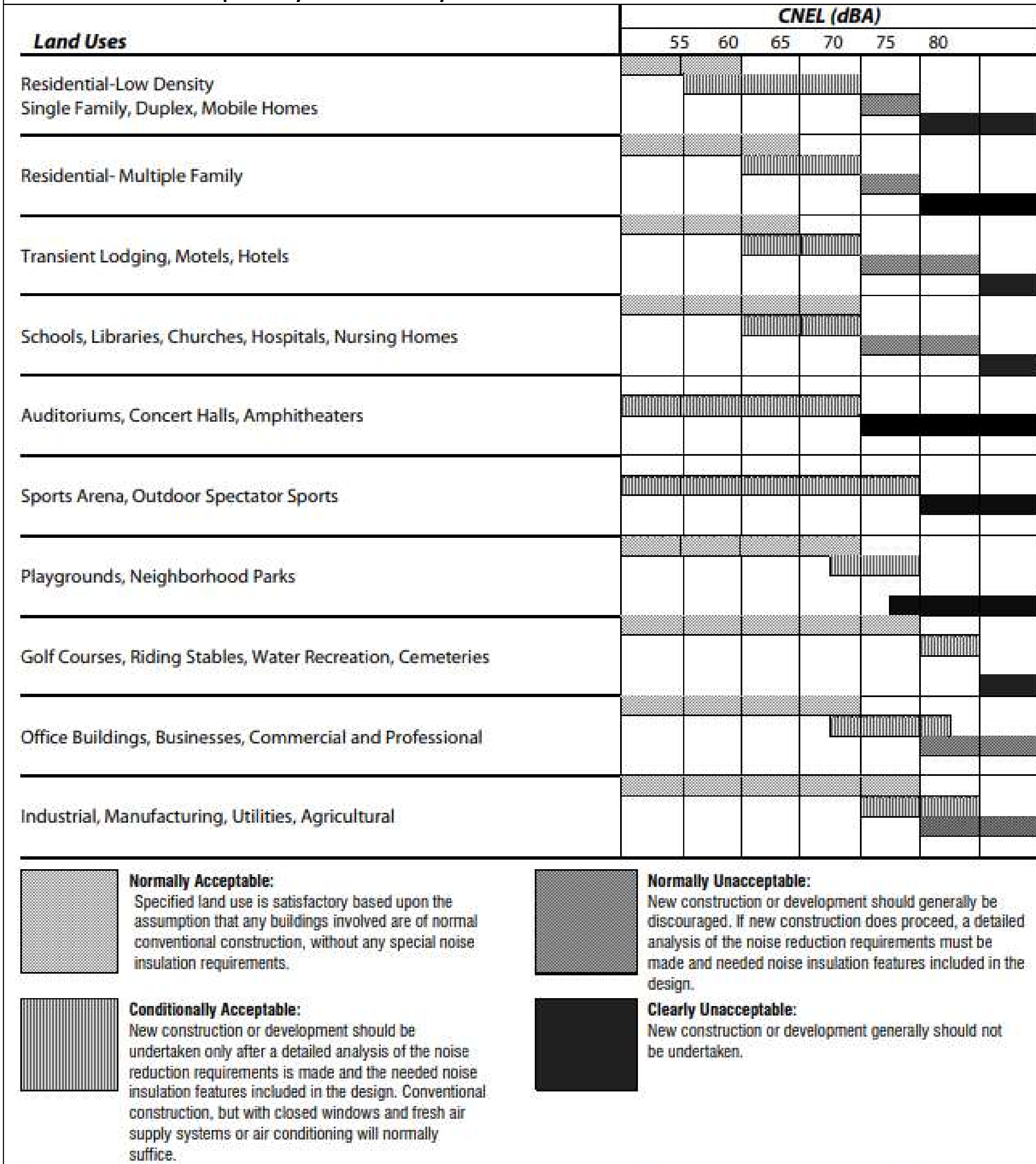
Land Use (Residential)	Interior Standards	Exterior Standards
10 p.m. - 7 a.m.	40 Leq (10 minute)	45 Leq (10 minute)
7 a.m. - 10 p.m.	55 Leq (10 minute)	65 Leq (10 minute)
Source: City of Menifee General Plan Noise Element		

- **N-1.8:** Locate new development in areas where noise levels are appropriate for the proposed uses. Consider federal, state, and city noise standards and guidelines as a part of new development review.
- **N-1.9:** Limit the development of new noise-producing uses adjacent to noise-sensitive receptors and require that new noise-producing land be are designed with adequate noise abatement measures.
- **N-1.13:** Require new development to minimize vibration impacts to adjacent uses during demolition and construction.

Land Use Compatibility

The noise criteria identified in the City of Menifee Noise Element are guidelines to evaluate the land use compatibility of transportation related noise. The compatibility criteria, shown on Table 5: Land Use Compatibility for Community Noise Environments, provides the City with a planning tool to gauge the compatibility of land uses relative to existing and future exterior noise levels. The Land Use Compatibility for Community Noise Exposure matrix describes categories of compatibility and not specific noise standards.

Table 5: Land Use Compatibility for Community Noise Environments



Source: California Office of Noise Control. Guidelines for the Preparation and Content of Noise Elements of the General Plan. February 1976. Adapted from the US EPA Office of Noise Abatement Control, Washington D.C. Community Noise. Prepared by Wyle Laboratories. December 1971.

Source: City of Menifee, *City of Menifee General Plan Noise Background Document and Definitions*, Table N-b3.

City of Menifee Municipal Code

The Menifee Municipal Code establishes the following noise provisions relative to the Project:

- All construction activities shall adhere to City of Menifee Municipal Code, Section 8.01.010, which requires projects within one-fourth mile from an occupied residence to operate Monday through Saturday, except nationally recognized holidays, from 6:30 a.m. to 7:00 p.m and prohibits construction from occurring on Sunday or nationally recognized holidays unless approval is obtained from the City Building Official or City Engineer. Compliance with City of Menifee Municipal Code Section 8.01.010 would reduce construction-related noise impacts.

Menifee MC Section 9.210.070 discusses the vibration levels for site development: All uses shall be so operated so as not to generate vibration discernible without instruments by the average person while on or beyond the lot upon which the sources is located or within an adjoining enclosed space if more than one establishment occupies a structure. Vibration caused by motor vehicles, trains and temporary construction is exempted from this standard.[3]

City of Menifee Design Guidelines – Appendix A: Industrial Good Neighbor Policies[4]

According to the City's Design Guidelines, the purpose of the Good Neighbor Policies (Policies) is to provide local government and developers with ways to address environmental and neighborhood compatibility issues associated with permitting warehouse, logistics and distribution facilities. The Policies were designed to promote economic vitality and sustainability of businesses, while still protecting the general health, safety, and welfare of the public and sensitive receptors within the City of Menifee. Sensitive receptors include residential neighborhoods, schools, public parks, playgrounds, day care centers, nursing homes, hospitals, and other public places where residents are most likely to spend time. The intent of the City of Menifee's Good Neighbor Policies, in siting new warehouse, logistics and distribution uses, include:

1. Minimize impacts to sensitive uses

2. Protect public health, safety, and welfare by regulating the design, location and operation of facilities

3. Protect neighborhood character of adjacent communities

The Policies apply to all new warehouse, logistics and distribution facilities ("industrial uses"), excluding pending applications that have been deemed complete as the effective day of this policy, that include any building larger than 100,000 square feet in size or any sized building with more than 10 loading bays (dock high). There are general performance standards, as well as site design, access and layout standards, signage and information standards, and environmental considerations, including air quality and noise and traffic. The Project would comply with the Policies below specifically relating to noise:

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[3] City of Menifee. (2023). Development Code Section 9.210.070 Vibrations. Available at: https://online.encodeplus.com/regs/menifee-ca/doc-viewer.aspx?secid=1550&keywords=noise%27s%2Cnoised%2Cnoises%2Cnoises%27%2Cnoising%2Cnoise#secid-1551 (accessed August 2023).

[4] City of Menifee. (2023). Development Code Section 9.210.070 Vibrations. Available at: https://online.encodeplus.com/regs/menifee-ca/doc-viewer.aspx?secid=1550&keywords=noise%27s%2Cnoised%2Cnoises%2Cnoises%27%2Cnoising%2Cnoise#secid-1551.

- Use of perimeter walls, buildings, and/or enhanced landscaping to reduce noise impacts as appropriate.

- If a public address (PA) system is being used in conjunction with an industrial use, the PA system shall be oriented away from sensitive receptors and the volume set at a level not readily audible past the property line.

- Prepare a construction traffic control plan prior to grading, detailing the locations of equipment stating areas, material stockpiles, proposed road closures, and hours of construction operations to minimize impacts to sensitive receptors.

4 EXISTING CONDITIONS

4.1 Existing Noise Sources

The City is impacted by various noise sources. Mobile sources of noise, especially cars, trucks, and trains are the most common and significant sources of noise. Other noise sources are the various land uses (i.e. residential, commercial, institutional, and recreational and parks activities) throughout the City that generate stationary-source noise.

Mobile Sources

Existing roadway noise levels were calculated for the roadway segments in the Project vicinity. This task was accomplished using the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108) and existing traffic volumes from the Project Traffic Impact Analysis (prepared by Kimley-Horn, July 2022). The noise prediction model calculates the average noise level at specific locations based on traffic volumes, average speeds, roadway geometry, and site environmental conditions. The average vehicle noise rates (also referred to as energy rates) used in the FHWA model have been modified to reflect average vehicle noise rates identified for California by the California Department of Transportation (Caltrans). The Caltrans data indicates that California automobile noise is 0.8 to 1.0 dBA higher than national levels and that medium and heavy truck noise is 0.3 to 3.0 dBA lower than national levels.

The average daily noise levels along roadway segments in proximity to the Project site are included in Table 6: Existing Traffic Noise Levels. Table 6 shows the existing traffic-generated noise level on Project-vicinity roadways currently ranges from 54.86 dBA CNEL to 66.73 dBA CNEL 100 feet from the centerline. As previously described, CNEL is 24-hour average noise level with a 5 dBA “weighting” during the hours of 7:00 p.m. to 10:00 p.m. and a 10 dBA “weighting” added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively.

Stationary Sources

The nearest source of stationary noise in the Project vicinity would come from existing single-family residential properties scattered around the Project site. Noise sources from residential uses typically include mechanical equipment such as HVAC, automobile related noise such as cars starting and doors slamming, and landscaping equipment. The noise associated with these sources may represent a single-event noise occurrence or short-term noise.

Table 6: Existing Traffic Noise Levels			
Roadway Segment		**ADT**	**dBA CNEL 100 Feet from Roadway Centerline**
Case Road	Goetz Road to Murrieta Road	7,642	61.93
	Murrieta Road to Mapes Road	5,815	60.75
Goetz Road	Case Road to Mapes Road	7,669	61.06
	Mapes Road to Ethanac Road	11,487	62.66
Murrieta Road	Case Road to Ethanac Road	2,521	54.86
	Ethanac Road to Rouse Road	7,947	59.89
	Chambers Avenue to McCall Blvd	7,587	59.68
Ethanac Road	Goetz Road to Wheat Street	14,349	63.65
	Wheat Street to Murrieta Road	14,391	63.64
	Murrieta Road to Evans Road	17,715	64.91
	Case Road to I-215 SB Ramps	25,161	66.73
	I-215 SB Ramps to I-215 NB Ramps	18,907	65.26
	I-215 NB Ramps to Trumble Road	14,139	64.10
McLaughlin Road	Byers Road to Murrieta Road	N/A	N/A
	Murrieta Road to Evans Road	N/A	N/A
Byers Road	Ethanac Road to McLaughlin Road	N/A	N/A
Wheat Road	Ethanac Road to McLaughlin Road	N/A	57.45
McCall Blvd	Murrieta Road to Sun City Blvd	8,375	62.78
	Bradley Road to I-215 SB Ramps	28,352	62.58
	I-215 SB Ramps to I-215 NB Ramps	27,453	62.62
	I-215 NB Ramps to Encanto Drive	27,638	61.93
ADT = average daily trips; dBA = A-weighted decibels; CNEL = community noise equivalent level, N/A = data not available			
Source: Based on traffic data within the *Traffic Study*, prepared by Kimley-Horn, July 2022. Refer to Appendix B for traffic noise modeling assumptions and results.			

4.2 Noise Measurements

The Project applicant proposes the development of approximately 700,037 SF of industrial warehouse space (including office space) within one building on a total of 36.8 net acres. The Project would include 393 automobile parking spaces and 221 truck trailer parking spaces. To quantify existing ambient noise levels in the Project area, Kimley-Horn conducted four short-term noise measurements; see Appendix A: Existing Ambient Noise Measurements. The noise measurement sites were representative of typical existing noise exposure within and immediately adjacent to the Project site. The 10-minute measurements were taken between 8:40 a.m. and 9:40 a.m. on September 7, 2022. Measurements of L_{eq} are considered representative of the noise levels throughout the day. The average noise levels and sources of noise measured at each location are listed in Table 7: Existing Noise Measurements and shown on Exhibit 4: Noise Measurement Locations.

Table 7: Existing Noise Measurements				
Site	**Location**[1]	**Measurement Period**	**Duration**	**L_{eq} (dBA)**
ST-1	Corner of Byers Road and Ethanac Road, northeast of Project site.	8:40 – 8:50 a.m.	10 Minutes	57.2
ST-2	Kuffel Road, north of Project site.	8:56 – 9:06 a.m.	10 Minutes	46.5
ST-3	Wheat Street, near Aaron Alan Drive intersection, west of Project site	9:11 – 9:21 a.m.	10 Minutes	48.4
ST-4	Byers Road, east of Project site.	9:30 – 9:40 a.m.	10 Minutes	44.4
1. Noise monitoring locations were selected to represent the ambient conditions at sensitive receptors in the vicinity of the Project site.				
Source: Noise measurements taken by Kimley-Horn, September 7, 2022. See Appendix A for noise measurement results.				

Source: ESRI World Imagery

Exhibit 4: Noise Measurement Location
City of Menifee
CADO Project

Not to Scale

Kimley»Horn

4.3 Sensitive Receptors

Noise exposure goals for various types of land uses reflect the varying noise sensitivities associated with those uses. Noise sensitive uses typically include residences, hospitals, schools, childcare facilities, and places of assembly. Vibration sensitive receivers are generally similar to noise sensitive receivers but may also include businesses, such as research facilities and laboratories that use vibration-sensitive equipment. The Project site is surrounded by vacant/undeveloped, agriculture, and scattered residential land uses to the west, south, and east. North of the Project is primarily residential. Sensitive land uses nearest to the Project are shown in Table 8: Sensitive Receptors.

Table 8: Sensitive Receptors

Receptor Description	Distance and Direction from the Project	Description
Single-family Residences	90 feet to the north	Houses along north side of Kuffel Road, between Wheat Street and Byers Road
Single-family Residences	100 feet to the west	Houses along west side of Wheat Street, between Kuffel Road and Corsica Lane
Single-family Residence	100 feet to the east	House along east side of Byers Road, between Kuffel Road and Corsica Lane
Single-family Residence	180 feet to the south	House along north side of Corsica Lane, between Wheat Street and Byers Road

Source: Google Earth

5 SIGNIFICANCE CRITERIA AND METHODOLOGY

5.1 CEQA Thresholds

Appendix G of the California Environmental Quality Act (CEQA) Guidelines contains analysis guidelines related to noise impacts. These guidelines have been used by the City to develop thresholds of significance for this analysis. A project would create a significant environmental impact if it would:

- Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Generate excessive ground-borne vibration or ground-borne noise levels; and
- For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the Project area to excessive noise levels.

5.2 Methodology

<u>Construction Noise</u>

Construction noise levels were based on typical noise levels generated by construction equipment published by the Federal Transit Administration (FTA) and the FHWA. Construction noise is assessed in dBA L_{eq}. This unit is appropriate because L_{eq} can be used to describe noise level from operation of each piece of equipment separately, and levels can be combined to represent the noise level from all equipment operating during a given period.

Construction noise modeling was conducting using the FHWA Roadway Construction Noise Model (RCNM). Reference noise levels are used to estimate operational noise levels at nearby sensitive receptors based on a standard noise attenuation rate of 6 dB per doubling of distance (line-of-sight method of sound attenuation for point sources of noise). The City of Menifee's General Plan and Municipal Code does not establish maximum numerical construction noise levels for potentially affected receivers, which would allow for a quantified determination of what CEQA constitutes as the generation of noise levels in excess of standards or as a substantial temporary or periodic noise increase. To evaluate whether the Project will generate potentially significant temporary construction noise levels at sensitive receiver locations, a construction-related noise level threshold has been adopted from the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual*. Due to the lack of standardized construction noise thresholds, the FTA provides guidelines that are considered reasonable criteria for evaluating construction noise impacts. Therefore, this analysis conservatively uses the FTA's threshold of 80 dBA (8-hour L_{eq}) for residential uses, 85 dBA (8-hour L_{eq}) for commercial uses, and 90 dBA (8-hour L_{eq}) for industrial uses.[5]

[5] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual, Table 7-2, Page 179, September 2018.

Operational Noise

Operational noise is evaluated based on the standards within the Menifee MC and GP. Menifee GP Noise Element N-1 section identifies a daytime (7:00 a.m. – 10:00 p.m.) standard of 55 dBA (interior) and 65 dBA (exterior) for residential receptors and a nighttime (10:00 p.m. – 7:00 a.m.) standard of 40 dBA (interior) and 45 dBA (exterior).

The analysis of the Without Project and With Project noise environments is based on noise prediction modeling and empirical observations. Reference noise level data are used to estimate the Project operational noise impacts from stationary sources. Noise levels are collected from field noise measurements and other published sources from similar types of activities are used to estimate noise levels expected with the Project's stationary sources. The reference noise levels are used to represent a worst-case noise environment as noise level from stationary sources can vary throughout the day. Operational noise is evaluated based on the standards within the City's Municipal Code and General Plan.

An analysis was conducted of the Project's effect on traffic noise conditions at offsite land uses. Without Project traffic noise levels were compared to With Project traffic noise levels. The environmental baseline is the Without Project condition. The Without Project and With Project traffic noise levels in the Project vicinity were calculated using the FHWA Highway Noise Prediction Model (FHWA-RD-77-108). The actual sound level at any receptor location is dependent upon such factors as the source-to-receptor distance and the presence of intervening structures (walls and buildings), barriers, and topography. The noise attenuating effects of changes in elevation, topography, and intervening structures were not included in the model. Therefore, the modeling effort is considered a worst-case representation of the roadway noise. In general, a 1.5-dBA increase is not perceptible, a 3-dBA increase in traffic noise is barely perceptible, while a 5-dBA increase is readily noticeable.

Vibration

Ground-borne vibration levels associated with construction-related activities for the Project were evaluated utilizing typical ground-borne vibration levels associated with construction equipment, obtained from FTA published data for construction equipment. Potential ground-borne vibration impacts related to building/structure damage and interference with sensitive existing operations were evaluated, considering the distance from construction activities to nearby land uses and typically applied criteria.

For a structure built traditionally, without assistance from qualified engineers, the FTA guidelines show that a vibration level of up to 0.20 in/sec is considered safe and would not result in any vibration damage. FTA guidelines show that modern engineered buildings built with reinforced-concrete, steel or timber can withstand vibration levels up to 0.50 in/sec and not experience vibration damage. The Caltrans 2020 Transportation and Construction Vibration Guidance Manual identifies the vibration threshold for human annoyance, vibrations levels of 0.04 in/sec begin to cause annoyance and levels of 0.2 in/sec is used for building damage.

6 POTENTIAL IMPACTS AND MITIGATION

6.1 Acoustical Impacts

Threshold 6.1 Would the Project generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Construction

On-Site Construction Noise. Construction noise typically occurs intermittently and varies depending on the nature or phase of construction (e.g. land clearing, grading, excavation, paving). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. During construction, exterior noise levels could affect residents surrounding the construction site. Project construction would occur near the existing residential uses scattered around the Project construction area. However, it is acknowledged that construction activities would occur throughout the Project site and would not be concentrated at a single point near sensitive receptors.

Construction activities would include demolition, site preparation, grading, building construction, paving, and architectural coating. Such activities would require industrial saws, excavators, and dozers during demolition; dozers and tractors during site preparation; excavators, graders, dozers, scrapers, and tractors during grading; cranes, forklifts, generators, tractors, and welders during building construction; pavers, rollers, and paving equipment during paving; and air compressors during architectural coating. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full power operation followed by 3 to 4 minutes at lower power settings. Other primary sources of acoustical disturbance would be random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts). Typical noise levels associated with individual construction equipment are listed in Table 9: Typical Construction Noise Levels and includes noise levels at 90 feet, the distance from the Project site to the nearest sensitive receptor.

Table 9: Typical Construction Noise Levels

Equipment	Typical Noise Level (dBA) at 50 feet from Source	Typical Noise Level (dBA) at 90 feet from Source[1]
Air Compressor	80	75
Backhoe	80	75
Compactor	82	77
Concrete Mixer	85	80
Concrete Pump	82	77
Concrete Vibrator	76	71
Crane, Mobile	83	78
Dozer	85	80
Generator	82	77
Grader	85	80
Impact Wrench	85	80
Jack Hammer	88	83
Loader	80	75
Paver	85	80
Pneumatic Tool	85	80
Pump	77	72
Roller	85	80

Table 9: Typical Construction Noise Levels		
Equipment	**Typical Noise Level (dBA) at 50 feet from Source**	**Typical Noise Level (dBA) at 90 feet from Source**[1]
Saw	76	71
Scraper	85	80
Shovel	82	77
Truck	84	79
1. Calculated using the inverse square law formula for sound attenuation: $dBA_2 = dBA_1 + 20Log(d_1/d_2)$ Where: dBA_2 = estimated noise level at receptor; dBA_1 = reference noise level; d_1 = reference distance; d_2 = receptor location distance		
Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.		

Although the construction equipment noise levels in Table 9 are from FTA's 2018 *Transit Noise and Vibration Impact Assessment Manual*, the noise levels are based on measured data from a U.S. Environmental Protection Agency report which uses data from the 1970s,[6] the FHWA Roadway Construction Noise Model uses data from the early 1990s, and other measured data. Since that time, construction equipment has been required to meet more stringent emissions standards and the additional necessary exhaust systems also reduce noise from what is shown in the table.

Project Construction Noise Levels

The City's Municipal Code does not establish quantitative exterior construction noise standards. However, Section 8.01.010 states construction activities within one-quarter mile of an occupied residence can only occur Monday through Saturday, except nationally recognized holidays, from 6:30 a.m. to 7:00 p.m. While the Menifee Municipal Code does not establish quantitative construction noise standards, this analysis conservatively uses the FTA's threshold of of 80 dBA (8-hour L_{eq}) for residential uses, 85 dBA (8-hour L_{eq}) for commercial uses, and 90 dBA (8-hour L_{eq}) for industrial uses.

The noise levels calculated in Table 10: Project Construction Noise Levels, show the exterior construction noise for the Project without accounting for attenuation from existing physical barriers. Construction noise has been calculated with FHWA's RCNM. The nearest noise sensitive receptors are residences to the north of the Project sites. Construction equipment was assumed to operate simultaneously to represent a worst-case noise scenario as construction activities would routinely be spread throughout the construction site and would operate at different intervals.

6 U.S. Environmental Protection Agency, *Noise from Construction Equipment and Operations, Building Equipment and Home Appliances*, NTID300.1, December 31, 1971.

Table 10: Project Construction Noise Levels						
Construction Phase	**Land Use**	**Receptor Location Relative to Construction Activity**			**Noise Threshold (dBA L_{eq})[3]**	**Exceeded?**
		Direction	**Distance (feet)[1]**	**Worst Case Modeled Exterior Noise Level (dBA L_{eq})[2]**		
Demolition	Residential	North	210	74.0	80	No
Site Preparation	Residential	North	675	65.0	80	No
Grading	Residential	North	675	65.6	80	No
Building Construction	Residential	North	675	64.3	80	No
Combined Paving and Architectural Coating	Residential	North	675	58.0	80	No

Notes:
1. Following FTA methodology, all equipment is assumed to operate at the center of the Project site because equipment would operate throughout the Project site and not at a fixed location for extended periods of time. Demolition would occur exclusively in the northeast corner of the site, thus the distance used in the RCNM model was 210 feet. Other construction phases would occur throughout the entire site, thus the distance used in the RCNM model was 675 feet to the nearest sensitive receptors to the north.
2. Modeled noise levels conservatively assume the simultaneous operation of all pieces of equipment.
3. Federal Transit Administration noise threshold of 80 dBA for residences.

Source: Federal Highway Administration, *Roadway Construction Noise Model,* 2006. Refer to Appendix A for noise modeling results.

FTA's construction threshold is an 8-hour L_{eq}, which accounts for the percentage of time each individual piece of equipment operates under full power in that period. Additionally, construction equipment moves throughout the site during that period. Construction noise is measured in L_{eq} which is used to measure average noise over an 8-hour workday. During an 8-hour period the construction equipment will move throughout the site. As construction equipment moves, the distances from the nearest receptor will change, therefore an average distance from the nearest sensitive receptor is used. Not all equipment would operate at the closest distance to the receptors and some equipment would operate further away.

The demolition phase of construction would be the loudest at the residences to the north of the Project sites based on the equipment used and the average distance of the demolition activities. During demolition, Table 10 shows that noise levels at these sensitive receptors would reach 74.0 dBA L_{eq} and therefore do not exceed the applicable FTA 80 dBA 8-hour L_{eq} construction threshold, resulting in a less than significant impact.

In addition, as required by the City Municipal Code, construction activities within one—fourth mile from an occupied residence may only occur between Monday through Saturday, except nationally recognized holidays, from 6:30 a.m. to 7:00 p.m., and construction activities are prohibited from occurring on Sunday or nationally recognized holidays unless approval is obtained from the City Building Official or City Engineer. Therefore, construction noise would have a less than significant impact.

Operations

Implementation of the proposed Project would create new sources of noise in the Project vicinity. The major noise sources associated with the Project would include:

- Mechanical equipment (i.e. trash compactors, air conditioners, etc.);
- Slow moving trucks on the Project site, approaching and leaving the loading areas;
- Activities at the loading areas (i.e. maneuvering and idling trucks, equipment noise);
- Parking areas (i.e. car door slamming, car radios, engine start-up, and car pass-by); and
- Off-Site Traffic Noise.

As discussed under the City of Menifee Design Guidelines, the City includes Policies for new warehouses, logistics, and distribution facilities that are intended to reduce operational noise impacts. These include perimeter walls or enhanced landscaping to reduce noise and orienting PA systems so that they are not readily audible past the property line. A wall surrounding the Project would reduce noise levels by 8 to 5 dBA, depending on whether the wall has gaps in it. The analysis shall conservatively assuming the perimeter wall will provide a reduction of 5 dBA.

Mechanical Equipment

The Project is located near residential properties to the north, south, east, and west. The nearest sensitive receptor to the Project site is approximately 90 feet north of the property boundary. Potential stationary noise sources related to long-term operation of the Project site would include mechanical equipment. Mechanical equipment (e.g. heating ventilation and air conditioning [HVAC] equipment) typically generates noise levels of approximately 52 dBA at 50 feet[7]. Based on conceptual site plans, the closest existing sensitive receptors to the building would be located 290 feet to the east. At this distance, and after taking into account a 5 dBA reduction for the perimeter wall, mechanical equipment noise would attenuate to 31.7 dBA which is below the City's exterior ambient noise standards of 45 dBA for nighttime (10:00 p.m. – 7:00 a.m.) and 65 dBA for daytime (7:00 a.m. – 10:00 p.m.) for residential receptors.

Operation of mechanical equipment would increase ambient noise levels at the property line of these receptors from 44.4 dBA (refer to Table 7) to 44.6 dBA, an increase of 0.2 dBA which is not perceptible to the human ear. Therefore, mechanical equipment noise would result in a less than significant impact.

Warehouse Truck and Loading Dock Noise

During loading and unloading activities, noise would be generated by the trucks' diesel engines, exhaust systems, and brakes during low gear shifting' braking activities; backing up toward the docks; dropping down the dock ramps; and maneuvering away from the docks. The proposed warehouse building includes dock-high doors for truck loading/unloading and manufacturing/light industrial operations. The dock-high doors are approximately 250 feet from the closest property line (residential uses located to the south).

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7 Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, July 6, 2010.

Vehicular access to the Project site would consist of several driveways, two driveways along Wheat Streat and two driveways along Byers Road. Loading dock noise is approximately 68 dBA at a distance of 30 feet. The property line of the closest sensitive receptor is located approximately 250 feet from the nearest proposed loading area. At this distance and after taking into account a 5 dBA reduction for the perimeter wall, loading dock noise would attenuate to 44.6 dBA which is below the City's exterior ambient noise standards of 45 dBA for nighttime (10:00 p.m. – 7:00 a.m.) and 65 dBA for daytime (7:00 a.m. – 10:00 p.m.) for residential receptors. The ambient noise levels at the nearest sensitive receptor would increase from 44.4 dBA (refer to Table 7) to 47.5 dBA, an increase of 3.1 dBA, which is barely perceptible to most people. Furthermore, loading dock doors would also be surrounded with protective aprons, gaskets, or similar improvements that, when a trailer is docked, would serve as a noise barrier between the interior warehouse activities and the exterior loading area. This would attenuate noise emanating from interior activities, and as such, interior loading and associated activities would be permissible during all hours of the day. Noise levels associated with trucks and loading or unloading activities would not exceed the City's standards and impacts would be less than significant.

Parking Noise

The Project would provide approximately 393 automobile parking stalls and 221 trailer parking stalls in total. Automobile parking stalls will be located along the east and west perimeter of the Project and trailer parking would be located along the north and south perimeter of the Project. Nominal parking noise would occur within the on-site parking facilities. Traffic associated with parking lots is typically not of sufficient volume to exceed community noise standards, which are based on a time-averaged scale such as the CNEL scale. The instantaneous maximum sound levels generated by a car door slamming, engine starting up, and car pass-bys range from 53 to 61 dBA[8] at 50 feet and may be an annoyance to adjacent noise-sensitive receptors. Conversations in parking areas may also be an annoyance to adjacent sensitive receptors. Sound levels of speech typically range from 33 dBA at 50 feet for normal speech to 50 dBA at 50 feet for very loud speech.[9] It should be noted that parking lot noises are instantaneous noise levels compared to noise standards in the hourly L_{eq} metric, which are averaged over the entire duration of a time period.

Based on peak p.m. traffic, a maximum of 840 vehicles would access the parking lot in a single hour. According to the trip generation information presented in the Traffic Study, 97 percent of these vehicles (815) accessing the site would be passenger vehicles and the remaining three percent (25) would be trucks. For a worst-case scenario all vehicles are assumed to park in the lot nearest to sensitive receptors, passenger vehicles will park in eastern lot, approximately 120 feet from the property line of sensitive receptors located east of the Project and trucks will park in the southern lot, approximately 32 feet from the property line of sensitive receptor to the south. At these distances and after taking into consideration the 5 dBA reduction from the perimeter wall, parking lot noise at the sensitive receptors to the east would be 42.9 dBA and parking lot noise at the sensitive receptor to the south would be 41.4 dBA, both of which are below the City's exterior ambient noise standards of 45 dBA for nighttime (10:00 p.m. – 7:00 a.m.) and 65 dBA for daytime (7:00 a.m. – 10:00 p.m.) for residential receptors.

Parking lot noise would increase ambient noise levels at the property line of these receptors. Ambient noise for sensitive receptors to the east of the Project would increase from 44.4 dBA (refer to Table 7) to 46.7 dBA, an increase of 2.3 dBA which is not perceptible to the human ear. Ambient noise for sensitive

8 Ibid. p. 28
9 Ibid. p. 28

receptors to the south of the Project would increase from 44.4 dBA (refer to Table 7) to 46.2 dBA, an increase of 1.8 dBA which is not perceptible to the human ear. Therefore, parking lot noise would result in a less than significant impact.

On-Site Composite Noise

Each on-site operational noise source would impact the closest sensitive receptor to the Project site. Table 11: On-Site Composite Noise shows the overall noise level generated by the Project at each of the closest sensitive receptors and the combined noise level experienced by the sensitive receptors from operations. A noise level of 5 dBA is considered readily noticeable. Therefore, ambient noise level increases of less than 5 dBA would be considered less than significant.

Table 11: On-Site Composite Noise

Sensitive Receptor	Modeled Exterior Operational Noise (dBA L_{eq})	Ambient Noise Level (dBA L_{eq})	Ambient + Project Combined Noise Level	Incremental Increase	Exceed Threshold?[1]
Sensitive Receptor 1 North of Project	38.4	46.5	47.1	0.6	No
Sensitive Receptor 2 West of Project	44.1	48.4	49.8	1.4	No
Sensitive Receptor 3 East of Project	47.0	44.4	48.9	4.5	No
Sensitive Receptor 4 South of Project	46.2	44.4	48.4	4.0	No

Notes:
1. An increase in ambient noise of 5 dBA is readily noticeable and considered significant.

Source: Refer to Appendix B for traffic noise modeling assumptions and results.

As shown in Table 11 none of the closest sensitive receptors would experience a noise level increase greater than 4.5 dBA. Therefore, on-site operational noise impacts with regard to increases in ambient noise levels would be less than significant.

Off-Site Traffic Noise

Implementation of the Project would generate increased traffic volumes along nearby roadway segments. Based on the Traffic Study, the proposed Project would result in approximately 4,508 daily trips. The Opening Year "2024 Without Project" and "2024 With Project" scenarios are compared in Table 12: Traffic Noise Levels. Table 12 shows roadway noise levels without the Project would range from 45.26 dBA CNEL to 69.02 dBA CNEL and between 47.29 dBA CNEL and 69.54 dBA CNEL with the Project.

In general, a 3-dBA increase in traffic noise is barely perceptible to people, while a 5-dBA increase is readily noticeable. As shown in Table 12 a maximum increase of 2.04 dBA would occur on McLaughlin Road. Typically, traffic volumes need to double in order to produce an increase in noise levels that are considered significant. It should be noted that although traffic volumes increase significantly on Byers Road and Wheat Street, traffic noise is not significant on these roadways. Byers Road and Wheat Street are both currently unpaved roads which will be paved as part of off-site Project improvements. Vehicles traveling on unpaved and gravel roads are 4-dBA louder than vehicles on paved roads.[10] Therefore "2024 With Project" noise levels on these roads would decrease when compared to "2024 Without Project" noise levels on unpaved roads. As shown in Table 12, traffic noise impacts would be less than significant.

Table 12: Traffic Noise Levels

Roadway Segment		2024 Without Project		2024 With Project		Change	Normally Acceptable Standard[2]	Significant Impact
		ADT	dBA CNEL[1]	ADT	dBA CNEL[1]			
Case Road	Goetz Road to Murrieta Road	8,731	62.51	8,731	62.51	0.00	60	No
	Murrieta Road to Mapes Road	6,422	61.18	6,499	61.23	0.05	60	No
Goetz Road	Case Road to Mapes Road	9,027	61.77	9,291	61.89	0.13	60	No
	Mapes Road to Ethanac Road	13,124	63.24	13,520	63.37	0.13	60	No
Murrieta Road	Case Road to Ethanac Road	2,964	55.56	3,041	55.68	0.11	60	No
	Ethanac Road to Rouse Road	13,529	62.20	13,886	62.31	0.11	60	No
	Chambers Avenue to McCall Blvd	13,956	62.32	14,378	62.45	0.13	60	No
Ethanac Road	Goetz Road to Wheat Street	20,946	65.29	21,518	65.81	0.52	60	No
	Wheat Street to Murrieta Road	23,868	65.84	27,853	66.83	0.99	60	No
	Murrieta Road to Evans Road	30,680	67.29	34,213	68.01	0.72	60	No
	Case Road to I-215 SB Ramps	42,664	69.02	46,215	69.54	0.51	60	No
	I-215 SB Ramps to I-215 NB Ramps	33,257	67.71	35,257	68.19	0.47	60	No
	I-215 NB Ramps to Trumble Road	25,449	66.65	25,801	67.00	0.36	60	No
McLaughlin Road	Byers Road to Murrieta Road	276	45.26	441	47.29	2.04	60	No
Byers Road	Ethanac Road to McLaughlin Road	2,878	56.65	5,884	55.76	-0.89[3]	60	No
Wheat Street	Ethanac Road to McLaughlin Road	N/A	N/A	1,550	49.90	N/A	60	No
McCall Blvd	Murrieta Road to Sun City Blvd	11,550	58.85	11,807	58.95	0.10	60	No
	Bradley Road to I-215 SB Ramps	33,718	63.54	33,975	63.57	0.03	60	No
	I-215 SB Ramps to I-215 NB Ramps	33,948	63.50	34,282	63.54	0.04	60	No
	I-215 NB Ramps to Encanto Drive	34,886	63.63	35,324	63.69	0.05	60	No

ADT = average daily traffic; dBA = A-weighted decibels; CNEL = community noise equivalent level. N/A = data not available

1. Traffic noise levels are at 100 feet from the roadway centerline. The actual sound level at any receptor location is dependent upon such factors as the source-to-receptor distance and the presence of intervening structures, barriers, and topography.
2. Noise levels up to 60 dBA CNEL are considered Normally Acceptable. Potential impacts occur when the Project change exceeds 3 dBA and the land use compatibility standard is exceeded (i.e., both must occur).
3. "2024 With Project" traffic noise on Byers Road and Wheat Street will decrease despite an increase in vehicle traffic because part of the Project's off-site improvements include paving those roads.

Source: Based on traffic data within the *Traffic Study*, prepared by Kimley-Horn, July 2022. Refer to Appendix B for traffic noise modeling assumptions and results.

Conclusion

As demonstrated in Table 10 through Table 12, implementation of the Project would not result in substantial temporary or permanent increases in ambient noise levels. Table 10 confirms that construction of the Project would not exceed construction noise thresholds. As discussed under operational noise and shown in Table 11, the Project would not result in noise levels that exceed applicable daytime and nighttime thresholds. In addition, Table 12 shows that traffic noise generated by the Project would not exceed applicable noise standards. Therefore, the Project would not result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the

[10] Linas Leipus, Donatas Butkus, and Tomas Janusevicius. *Research on Motor Transport Produced Noise on Gravel and Asphalt Roads*, Baltic Journal of Road and Bridge Engineering 5(3):125-131, 2010

Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. As a result, impacts would be less than significant.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

Threshold 6.2 Would the Project generate excessive ground-borne vibration or ground-borne noise levels?

Construction Vibration

Construction can generate varying degrees of ground vibration, depending on the construction procedures and equipment. Operation of construction equipment generates vibrations that spread through the ground and diminish with distance from the source. Construction on the Project site would have the potential to result in varying degrees of temporary ground-borne vibration, depending on the specific construction equipment used and the operations involved.

The FTA has published standard vibration velocities for construction equipment operations. In general, the FTA architectural damage criterion for continuous vibrations (i.e., 0.2 in/sec) appears to be conservative. The types of construction vibration impacts include human annoyance and building damage. Human annoyance occurs when construction vibration rises significantly above the threshold of human perception for extended periods of time. Building damage can be cosmetic or structural. Ordinary buildings that are not particularly fragile would not experience any cosmetic damage (e.g., plaster cracks) at distances beyond 30 feet. This distance can vary substantially depending on the soil composition and underground geological layer between vibration source and receiver. In addition, not all buildings respond similarly to vibration generated by construction equipment. For example, for a building that is constructed with reinforced concrete with no plaster, the FTA guidelines show that a vibration level of up to 0.20 in/sec is considered safe and would not result in any construction vibration damage.

Table 13: Typical Construction Equipment Vibration Levels lists vibration levels at 25 feet for typical construction equipment. Vibration levels at 50 feet, the distance from the Project boundary to the nearest existing structure is also included in Table 13. Ground-borne vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. As indicated in Table 13, based on FTA data, vibration velocities from typical heavy construction equipment operations that would be used during Project construction range from 0.0011 to 0.0315 in/sec PPV at 50 feet from the source of activity.

Table 13: Typical Construction Equipment Vibration Levels		
Equipment	**Peak Particle Velocity at 25 Feet (in/sec)**	**Peak Particle Velocity at 50 Feet (in/sec)[1]**
Large Bulldozer	0.089	0.0315
Caisson Drilling	0.089	0.0315
Loaded Trucks	0.076	0.0269
Jackhammer	0.035	0.0124
Small Bulldozer/Tractors	0.003	0.0011
[1] Calculated using the following formula: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$, where: PPV_{equip} = the peak particle velocity in in/sec of the equipment adjusted for the distance; PPV_{ref} = the reference vibration level in in/sec from Table 7-4 of the Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, 2018; D = the distance from the equipment to the receiver.		
Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, 2018.		

The nearest structure to the Project construction site is approximately 50 feet away. Table 13 shows that at 50 feet the vibration velocities from construction equipment would not exceed 0.0315 in/sec PPV, which is below the FTA's 0.20 in/sec PPV threshold for building damage and below the 0.04 in/sec PPV annoyance threshold. It is also acknowledged that construction activities would occur throughout the Project site and would not be concentrated at the point closest to the nearest structure. Therefore, vibration impacts associated with Project construction would be less than significant.

Operational Vibration

The Project would include truck movement activity at the Project site. These movements would generally be low-speed (i.e., less than 15 miles per hour) and would occur over new, smooth surfaces. For perspective, Caltrans has studied the effects of propagation of vehicle vibration on sensitive land uses and notes that "heavy trucks, and quite frequently buses, generate the highest earthborn vibrations of normal traffic." Caltrans further notes that the highest traffic-generated vibrations are along freeways and state routes. Their study finds that "vibrations measured on freeway shoulders (five meters from the centerline of the nearest lane) have never exceeded 0.08 inches per second, with the worst combinations of heavy trucks and poor roadway conditions (while such trucks were moving at freeway speeds). This level coincides with the maximum recommended safe level for ruins and ancient monuments (and historic buildings)."[11] Since the Project's truck movements would be at low speed (not at freeway speeds) and would be over smooth surfaces (not under poor roadway conditions), Project-related vibration associated with truck activity would not result in excessive ground-borne vibrations; no vehicle-generated vibration impacts would occur. In addition, there are no sources of substantial ground-borne vibration associated with the Project, such as rail or subways. The Project would not create or cause any vibration impacts due to operations.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

[11] California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol ("TeNS")*, September 2013.

Threshold 6.3 For a Project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the Project area to excessive noise levels?

The closest airport to the Project site is the Perris Valley Aviation Airport located approximately one mile to the north. Although the Project is within two miles of the Perris Valley airport, it is outside of the 55 CNEL noise contour[12]. Additionally, there are no private airstrips located within the Project vicinity. Therefore, the Project would not expose people working in the Project area to excessive airport- or airstrip-related noise levels and no mitigation is required.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

6.2 Cumulative Noise Impacts

Cumulative Construction Noise

The Project's construction activities would not result in a temporary increase in ambient noise levels. Construction noise would be periodic and temporary noise impacts that would cease upon completion of construction activities. The Project would contribute to other proximate construction project noise impacts if other construction activities were conducted concurrently. However, based on the noise analysis above, the Project's construction-related noise impacts would be less than significant and would comply with the City of Menifee Municipal Code and General Plan.

Construction activities at other planned and approved projects near the Project site would be required to comply with applicable City regulations related to noise and would take place during daytime hours on the days permitted by the applicable Municipal Code, and projects requiring discretionary City approvals would be required to evaluate construction noise impacts, comply with the City's standard conditions of approval, and implement mitigation, if necessary, to minimize noise impacts. Construction noise impacts are by nature localized. Based on the fact that noise dissipates as it travels away from its source, noise impacts would be limited to the Project site and vicinity. Therefore, Project construction would not result in a cumulatively considerable contribution to significant cumulative impacts and impacts in this regard are not cumulatively considerable.

Cumulative Operational Noise

Cumulative Off-Site Traffic Noise

Cumulative noise impacts describe how much noise levels are projected to increase over existing conditions with the development of the proposed Project and other foreseeable projects. Cumulative noise impacts would occur primarily as a result of increased traffic on local roadways due to buildout of the proposed Project and other projects in the vicinity. Cumulative increases in traffic noise levels were estimated by comparing the Existing and Opening Year Without Project scenarios to the Opening Year

[12] Riverside County Airport Land Use Commission, *Perris Valley Airport Ultimate Noise Impacts*, July 2010.

Plus Project scenario. The traffic analysis considers cumulative traffic from future growth assumed in the transportation model, as well as cumulative projects.

A project's contribution to a cumulative traffic noise increase would be considered significant when the combined effect exceeds perception level (i.e., auditory level increase) threshold. The following criteria is used to evaluate the combined and incremental effects of the cumulative noise increase.

- *Combined Effect.* The cumulative with Project noise level ("Opening Year With Project") would cause a significant cumulative impact if a 3.0 dB increase over "Existing" conditions occurs and the resulting noise level exceeds the applicable exterior standard at a sensitive use. Although there may be a significant noise increase due to the proposed Project in combination with other related projects (combined effects), it must also be demonstrated that the Project has an incremental effect. In other words, a significant portion of the noise increase must be due to the proposed Project.

- *Incremental Effects*. The "Opening Year With Project" causes a 1.0 dBA increase in noise over the "Opening Year Without Project" noise level.

A significant impact would result only if both the combined and incremental effects criteria have been exceeded. Noise by definition is a localized phenomenon and reduces as distance from the source increases. Consequently, only the proposed Project and growth due to occur in the general area would contribute to cumulative noise impacts.

Table 14: Cumulative Off-Site Traffic Noise Levels identifies the traffic noise effects along roadway segments in the Project vicinity for "Existing," "Opening Year Without Project," and "Opening Year With Project," conditions, including incremental and net cumulative impacts.

Table 14: Cumulative Off-Site Traffic Noise Levels

Roadway Segment		Existing[1]	Opening Year Without Project[1]	Opening Year With Project[1]	Combined Effects	Incremental Effects	Cumulatively Significant Impact?
					Difference In dBA Between Existing and Opening Year With Project	Difference In dBA Between Opening Year Without Project and Opening Year With Project	
Case Road	Goetz Road to Murrieta Road	61.93	62.51	62.51	0.58	0.00	No
	Murrieta Road to Mapes Road	60.75	61.18	61.23	0.48	0.05	No
Goetz Road	Case Road to Mapes Road	61.06	61.77	61.89	0.83	0.13	No
	Mapes Road to Ethanac Road	62.66	63.24	63.37	0.71	0.13	No
Murrieta Road	Case Road to Ethanac Road	54.86	55.56	55.68	0.81	0.11	No
	Ethanac Road to Rouse Road	59.89	62.20	62.31	2.42	0.11	No
	Chambers Avenue to McCall Blvd	59.68	62.32	62.45	2.78	0.13	No

Table 14: Cumulative Off-Site Traffic Noise Levels							
Roadway Segment		**Existing[1]**	**Opening Year Without Project[1]**	**Opening Year With Project[1]**	**Combined Effects**	**Incremental Effects**	**Cumulatively Significant Impact?**
					Difference In dBA Between Existing and Opening Year With Project	**Difference In dBA Between Opening Year Without Project and Opening Year With Project**	
Ethanac Road	Goetz Road to Wheat Street	63.65	65.29	65.81	2.16	0.52	No
	Wheat Street to Murrieta Road	63.64	65.84	66.83	3.19	0.99	No
	Murrieta Road to Evans Road	64.91	67.29	68.01	3.10	0.72	No
	Case Road to I-215 SB Ramps	66.73	69.02	69.54	2.81	0.51	No
	I-215 SB Ramps to I-215 NB Ramps	65.26	67.71	68.19	2.92	0.47	No
	I-215 NB Ramps to Trumble Road	64.10	66.65	67.00	2.91	0.36	No
McLaughlin Road	Byers Road to Murrieta Road	N/A	45.26	47.29	N/A	2.04	No
Byers Road	Ethanac Road to McLaughlin Road	N/A	56.65	55.76	N/A	-0.89	No
Wheat Road	Ethanac Road to McLaughlin Road	N/A	N/A	49.90	N/A	N/A	No
McCall Blvd	Murrieta Road to Sun City Blvd	57.45	58.85	58.95	1.49	0.10	No
	Bradley Road to I-215 SB Ramps	62.78	63.54	63.57	0.79	0.03	No
	I-215 SB Ramps to I-215 NB Ramps	62.58	63.50	63.54	0.96	0.04	No
	I-215 NB Ramps to Encanto Drive	62.62	63.63	63.69	1.07	0.05	No
ADT = average daily trips; dBA = A-weighted decibels; CNEL = Community Noise Equivalent Level, N/A = data not available							
1. Traffic noise levels are at 100 feet from the roadway centerline. The actual sound level at any receptor location is dependent upon such factors as the source-to-receptor distance and the presence of intervening structures, barriers, and topography.							
Source: Based on traffic data within the *Traffic Study*, prepared by Kimley-Horn, July 2022. Refer to Appendix B							

Table 14 shows the increase for combined effects and incremental effects and none of the segments meet the criteria for cumulative noise increase. The proposed Project would not result in long-term mobile noise impacts based on project-generated traffic as well as cumulative and incremental noise levels. Therefore, the proposed Project, in combination with cumulative background traffic noise levels, would result in a less than significant cumulative impact. The proposed Project's contribution would not be cumulatively considerable.

Cumulative Stationary Noise

The stationary noise sources of the Project would not result in an incremental increase in non-transportation noise sources in the Project vicinity. Furthermore, as discussed under operations, the operational noise generated by the Project would be less than significant and would not result in cumulatively considerable impact. Existing daytime ambient noise levels are less than the noise limits established in the City's municipal code and the increase in over ambient conditions is less than 5 dBA (refer to Table 11). Similar to the Project, other planned and approved projects that exceed the City's noise thresholds would be required to mitigate for stationary noise impacts at nearby sensitive receptors. As stationary noise sources are generally localized, there is a limited potential of other projects to contribute to cumulative noise impacts.

No known past, present, or reasonably foreseeable projects would combine with the operational noise levels generated by the Project to increase noise levels above acceptable standards because each project must comply with applicable City regulations that limit operational noise. Therefore, the Project, together with other projects, would not create a significant cumulative impact, and even if there was such a significant cumulative impact, the Project would not make a cumulatively considerable contribution to significant cumulative operational noises.

Given that noise dissipates as it travels away from its source, operational noise impacts from on-site activities and other stationary sources would be limited to the Project site and vicinity. Thus, cumulative operational noise impacts from related projects, in conjunction with Project specific noise impacts, would not be cumulatively significant.

7 REFERENCES

1. California Department of Transportation, *California Vehicle Noise Emission Levels*, 1987.
2. California Department of Transportation, *Traffic Noise Analysis Protocol*, 2020.
3. California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, 2013.
4. California Department of Transportation, *Transportation and Construction Vibration Guidance Manual*, 2020.
5. City of Menifee General Plan, 2013.
6. City of Menifee, *Municipal Code*, 2022.
7. County of Riverside, *General Plan*, 2015.
8. County of Riverside, *Code of Ordinances*, 2019.
9. Federal Highway Administration, *Noise Measurement Handbook – Final Report*, 2018.
10. Federal Highway Administration, *Roadway Construction Noise Model*, 2006.
11. Federal Highway Administration, *Roadway Construction Noise Model User's Guide Final Report*, 2006.
12. Federal Interagency Committee on Noise, *Federal Agency Review of Selected Airport Noise Analysis Issues*, 1992.
13. Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, 2018.
14. HPA Architecture, *Menifee 700K,* October 2023
15. Kimley-Horn, *Traffic Study for the: CADO Warehouse Project in the City of Menifee*, July 2022.
16. Linas Leipus, *Research on Motor Transport Produced Noise on Gravel and Asphalt Roads*, 2010. https://www.researchgate.net/journal/The-Baltic-Journal-of-Road-and-Bridge-Engineering-1822-4288
17. United States Environmental Protection Agency, *Protective Noise Levels (EPA 550/9-79-100)*, 1979.

Appendix A

Existing Ambient Noise Measurements

Noise Measurement Field Data

Project:	Menifee CADO Warehouse	**Job Number:**	094991014.3.023
Site No.:	ST-1	**Date:**	9/7/2022
Analyst:	Daisy Pineda and Steven Yu	**Time:**	8:40 - 8:50 AM
Location:	Northern end of Byers Road, northeast of Project site		
Noise Sources:	Donkey, birds, car traffic		
Comments:			

Results (dBA):

	Leq:	Lmin:	Lmax:	Peak:
Measurement 1:	57.2	39.6	69.3	88.2

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	85°
Wind (mph):	< 5
Sky:	Clear
Bar. Pressure:	29.94 inHg
Humidity:	45%

Photo:

Kimley»Horn

Summary

File Name on Meter	CADO.001.s
File Name on PC	LxTse_0007061-20220907 084023-CADO.001.ldbin
Serial Number	0007061
Model	SoundExpert® LxT
Firmware Version	2.404
User	
Location	
Job Description	
Note	

Measurement

Description	
Start	2022-09-07 08:40:23
Stop	2022-09-07 08:50:23
Duration	00:10:00.0
Run Time	00:10:00.0
Pause	00:00:00.0
Pre-Calibration	2022-09-06 16:57:54
Post-Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamplifier	PRMLxT1L
Microphone Correction	FF:90 2116
Integration Method	Linear
OBA Range	Normal
OBA Bandwidth	1/1 and 1/3
OBA Frequency Weighting	A Weighting
OBA Max Spectrum	At LMax
Overload	123.0 dB

	A	**C**	**Z**
Under Range Peak	**79.5**	76.5	81.5 dB
Under Range Limit	**24.4**	25.5	31.8 dB
Noise Floor	15.2	16.4	22.6 dB

	First	**Second**	**Third**
Instrument Identification	ıley-Horn and Associates	Town&Country Rd, #700	Orange, CA 92868

Results

LAeq	57.2 dB	
LAE	85.0 dB	
EA	34.987 µPa²h	
LApeak (max)	2022-09-07 08:45:54	88.2 dB
LASmax	2022-09-07 08:47:18	69.3 dB
LASmin	2022-09-07 08:47:54	39.6 dB
SEA	-99.9 dB	

Noise Measurement Field Data

Project:	Menifee CADO Warehouse	**Job Number:**	94991014
Site No.:	ST-2	**Date:**	9/7/2022
Analyst:	Daisy Pineda and Steven Yu	**Time:**	8:56 - 9:06 AM
Location:	Along Kuffel Road, northern part of Project site		
Noise Sources:	Birds (turkey)		
Comments:			

Results (dBA):

	Leq:	Lmin:	Lmax:	Peak:
Measurement 1:	46.5	40.5	52.6	78.6

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	87°
Wind (mph):	< 5
Sky:	Clear
Bar. Pressure:	29.94 inHg
Humidity:	41%

Photo:

Kimley»Horn

Summary

File Name on Meter	CADO.002.s
File Name on PC	LxTse_0007061-20220907 085627-CADO.002.ldbin
Serial Number	0007061
Model	SoundExpert® LxT
Firmware Version	2.404
User	
Location	
Job Description	
Note	

Measurement

Description	
Start	2022-09-07 08:56:27
Stop	2022-09-07 09:06:27
Duration	00:10:00.0
Run Time	00:10:00.0
Pause	00:00:00.0
Pre-Calibration	2022-09-06 16:57:48
Post-Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting			
Peak Weight	A Weighting			
Detector	Slow			
Preamplifier	PRMLxT1L			
Microphone Correction	FF:90 2116			
Integration Method	Linear			
OBA Range	Normal			
OBA Bandwidth	1/1 and 1/3			
OBA Frequency Weighting	A Weighting			
OBA Max Spectrum	At LMax			
Overload	123.0 dB			
	A	**C**	**Z**	
Under Range Peak	**79.5**	76.5	81.5	dB
Under Range Limit	**24.4**	25.5	31.8	dB
Noise Floor	15.2	16.4	22.6	dB
	First	**Second**	**Third**	
Instrument Identification	ıley-Horn and Associates	Town&Country Rd, #700	Orange, CA 92868	

Results

LAeq	46.5 dB	
LAE	74.3 dB	
EA	2.978 µPa²h	
LApeak (max)	2022-09-07 08:56:53	78.6 dB
LASmax	2022-09-07 08:57:04	52.6 dB
LASmin	2022-09-07 08:56:49	40.5 dB
SEA	-99.9 dB	

Noise Measurement Field Data

Project:	Menifee CADO Warehouse	**Job Number:**	94991014
Site No.:	ST-3	**Date:**	9/7/2022
Analyst:	Daisy Pineda and Steven Yu	**Time:**	9:11 - 9:21 AM
Location:	Along Wheat Street, southwestern edge of Project site		
Noise Sources:	Goats		
Comments:			

Results (dBA):

	Leq:	Lmin:	Lmax:	Peak:
Measurement 1:	48.4	39.7	52.4	81.4

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	88°
Wind (mph):	< 5
Sky:	Clear
Bar. Pressure:	29.94 inHg
Humidity:	40%

Photo:

Kimley»Horn

Summary

File Name on Meter	CADO.003.s
File Name on PC	LxTse_0007061-20220907 091143-CADO.003.ldbin
Serial Number	0007061
Model	SoundExpert® LxT
Firmware Version	2.404
User	
Location	
Job Description	
Note	

Measurement

Description	
Start	2022-09-07 09:11:43
Stop	2022-09-07 09:21:43
Duration	00:10:00.0
Run Time	00:10:00.0
Pause	00:00:00.0
Pre-Calibration	2022-09-06 16:57:48
Post-Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting		
Peak Weight	A Weighting		
Detector	Slow		
Preamplifier	PRMLxT1L		
Microphone Correction	FF:90 2116		
Integration Method	Linear		
OBA Range	Normal		
OBA Bandwidth	1/1 and 1/3		
OBA Frequency Weighting	A Weighting		
OBA Max Spectrum	At LMax		
Overload	123.0 dB		
	A	**C**	**Z**
Under Range Peak	**79.5**	76.5	81.5 dB
Under Range Limit	**24.4**	25.5	31.8 dB
Noise Floor	15.2	16.4	22.6 dB
	First	**Second**	**Third**
Instrument Identification	ıley-Horn and Associates	Town&Country Rd, #700	Orange, CA 92868

Results

LAeq	48.4 dB	
LAE	76.2 dB	
EA	4.612 µPa²h	
LApeak (max)	2022-09-07 09:14:22	81.4 dB
LASmax	2022-09-07 09:14:22	52.4 dB
LASmin	2022-09-07 09:13:23	39.7 dB
SEA	-99.9 dB	

Noise Measurement Field Data

Project:	Menifee CADO Warehouse	**Job Number:**	94991014
Site No.:	ST-4	**Date:**	9/7/2022
Analyst:	Daisy Pineda and Steven Yu	**Time:**	9:30 - 9:40 AM
Location:	Along Byers Road, western edge of Project site		
Noise Sources:	Car traffic, distant honks		
Comments:			

Results (dBA):

	Leq:	Lmin:	Lmax:	Peak:
Measurement 1:	44.4	36.9	51.9	72.0

Equipment	
Sound Level Meter:	LD SoundExpert LxT
Calibrator:	CAL200
Response Time:	Slow
Weighting:	A
Microphone Height:	5 feet

Weather	
Temp. (degrees F):	90°
Wind (mph):	< 5
Sky:	Clear
Bar. Pressure:	29.94 inHg
Humidity:	36%

Photo:

Kimley»Horn

Summary

File Name on Meter	CADO.004.s
File Name on PC	LxTse_0007061-20220907 093026-CADO.004.ldbin
Serial Number	0007061
Model	SoundExpert® LxT
Firmware Version	2.404
User	
Location	
Job Description	
Note	

Measurement

Description	
Start	2022-09-07 09:30:26
Stop	2022-09-07 09:40:26
Duration	00:10:00.0
Run Time	00:10:00.0
Pause	00:00:00.0
Pre-Calibration	2022-09-06 16:57:48
Post-Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting			
Peak Weight	A Weighting			
Detector	Slow			
Preamplifier	PRMLxT1L			
Microphone Correction	FF:90 2116			
Integration Method	Linear			
OBA Range	Normal			
OBA Bandwidth	1/1 and 1/3			
OBA Frequency Weighting	A Weighting			
OBA Max Spectrum	At LMax			
Overload	123.0	dB		
	A		**C**	**Z**
Under Range Peak	**79.5**		76.5	81.5 dB
Under Range Limit	**24.4**		25.5	31.8 dB
Noise Floor	15.2		16.4	22.6 dB
	First		**Second**	**Third**
Instrument Identification	ıley-Horn and Associates		Town&Country Rd, #700	Orange, CA 92868

Results

LAeq	44.4 dB	
LAE	72.2 dB	
EA	1.836 µPa²h	
LApeak (max)	2022-09-07 09:30:32	72.0 dB
LASmax	2022-09-07 09:30:26	51.9 dB
LASmin	2022-09-07 09:30:59	36.9 dB
SEA	-99.9 dB	

Appendix B

Noise Modeling Data

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/9/2022
Case Description: Demo

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
residential	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	210	0
Excavator	No	40		80.7	210	0
Dozer	No	40		81.7	210	0
Excavator	No	40		80.7	210	0
Excavator	No	40		80.7	210	0
Dozer	No	40		81.7	210	0

Results

		Calculated (dBA)		Noise Limits (dBA)				
				Day		Evening		Night
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Concrete Saw		77.1	70.1	N/A	N/A	N/A	N/A	N/A
Excavator		68.2	64.3	N/A	N/A	N/A	N/A	N/A
Dozer		69.2	65.2	N/A	N/A	N/A	N/A	N/A
Excavator		68.2	64.3	N/A	N/A	N/A	N/A	N/A
Excavator		68.2	64.3	N/A	N/A	N/A	N/A	N/A
Dozer		69.2	65.2	N/A	N/A	N/A	N/A	N/A
	Total	77.1	74	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/9/2022
Case Description: Site Prep

---- Receptor #1 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
residential	Residential	1	1	1

				Equipment			
				Spec	Actual	Receptor	Estimated
		Impact		Lmax	Lmax	Distance	Shielding
Description		Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Dozer		No	40		81.7	675	0
Tractor		No	40	84		675	0
Dozer		No	40		81.7	675	0
Dozer		No	40		81.7	675	0
Tractor		No	40	84		675	0
Tractor		No	40	84		675	0
Tractor		No	40	84		675	0

				Results			
		Calculated (dBA)			Noise Limits (dBA)		
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Dozer		59.1	55.1	N/A	N/A	N/A	N/A
Tractor		61.4	57.4	N/A	N/A	N/A	N/A
Dozer		59.1	55.1	N/A	N/A	N/A	N/A
Dozer		59.1	55.1	N/A	N/A	N/A	N/A
Tractor		61.4	57.4	N/A	N/A	N/A	N/A
Tractor		61.4	57.4	N/A	N/A	N/A	N/A
Tractor		61.4	57.4	N/A	N/A	N/A	N/A
	Total	61.4	65	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/9/2022
Case Description: Grading

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
residential	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	675	0
Excavator	No	40		80.7	675	0
Grader	No	40	85		675	0
Dozer	No	40		81.7	675	0
Scraper	No	40		83.6	675	0
Scraper	No	40		83.6	675	0
Tractor	No	40	84		675	0
Tractor	No	40	84		675	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq
Excavator		58.1	54.1	N/A	N/A	N/A	N/A
Excavator		58.1	54.1	N/A	N/A	N/A	N/A
Grader		62.4	58.4	N/A	N/A	N/A	N/A
Dozer		59.1	55.1	N/A	N/A	N/A	N/A
Scraper		61	57	N/A	N/A	N/A	N/A
Scraper		61	57	N/A	N/A	N/A	N/A
Tractor		61.4	57.4	N/A	N/A	N/A	N/A
Tractor		61.4	57.4	N/A	N/A	N/A	N/A
	Total	62.4	65.6	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/9/2022
Case Description: Building Construction

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
residential	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	675	0
Front End Loader	No	40		79.1	675	0
Front End Loader	No	40		79.1	675	0
Front End Loader	No	40		79.1	675	0
Generator	No	50		80.6	675	0
Tractor	No	40	84		675	0
Tractor	No	40	84		675	0
Tractor	No	40	84		675	0
Welder / Torch	No	40		74	675	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq
Crane		57.9	50	N/A	N/A	N/A	N/A
Front End Loader		56.5	52.5	N/A	N/A	N/A	N/A
Front End Loader		56.5	52.5	N/A	N/A	N/A	N/A
Front End Loader		56.5	52.5	N/A	N/A	N/A	N/A
Generator		58	55	N/A	N/A	N/A	N/A
Tractor		61.4	57.4	N/A	N/A	N/A	N/A
Tractor		61.4	57.4	N/A	N/A	N/A	N/A
Tractor		61.4	57.4	N/A	N/A	N/A	N/A
Welder / Torch		51.4	47.4	N/A	N/A	N/A	N/A
	Total	61.4	64.3	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/9/2022
Case Description: Paving and Architectural Coating

---- Receptor #1 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
residential	Residential	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	675	0
Paver	No	50		77.2	675	0
Compressor (air)	No	40		77.7	675	0
Roller	No	20		80	675	0
Roller	No	20		80	675	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq
Paver		54.6	51.6	N/A	N/A	N/A	N/A
Paver		54.6	51.6	N/A	N/A	N/A	N/A
Compressor (air)		55.1	51.1	N/A	N/A	N/A	N/A
Roller		57.4	50.4	N/A	N/A	N/A	N/A
Roller		57.4	50.4	N/A	N/A	N/A	N/A
	Total	57.4	58	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels

Project Name:
Project Number:
Scenario: Existing
Ldn/CNEL: CNEL

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

								Vehicle Mix			Distance from Centerline of Roadway			
				Median	ADT	Speed	Alpha	Medium	Heavy	CNEL at	Distance to Contour			
#	Roadway	Segment	Lanes	Width	Volume	(mph)	Factor	Trucks	Trucks	100 Feet	70 CNEL	65 CNEL	60 CNEL	55 CNEL
1	Case Road	Goetz Road to Murrieta Road	2	0	7,642	55	0.5	1.6%	0.4%	61.93	-	62	135	290
2	Case Road	Murrieta Road to Mapes Road	2	0	5,815	55	0.5	1.6%	0.4%	60.75	-	52	112	242
3	Goetz Road	Case Road to Mapes Road	4	13	7,669	50	0.5	1.6%	0.4%	61.06	-	55	118	254
4	Goetz Road	Mapes Road to Ethanac Road	2	13	11,487	50	0.5	1.6%	0.4%	62.66	-	70	151	324
5	Murrieta Road	Case Road to Ethanac Road	2	0	2,521	45	0.5	1.6%	0.4%	54.86	-	-	45	98
6	Murrieta Road	Ethanac Road to Rouse Road	2	13	7,947	45	0.5	1.6%	0.4%	59.89	-	46	98	212
7	Murrieta Road	Chambers Avenue to McCall Blvd	4	0	7,587	45	0.5	1.6%	0.4%	59.68	-	45	96	207
8	Ethanac Road	Goetz Road to Wheat Street	4	14	14,349	50	0.5	1.6%	0.4%	63.65	-	83	179	385
9	Ethanac Road	Wheat Street to Murrieta Road	4	14	14,391	50	0.5	1.6%	0.2%	63.64	-	81	175	377
10	Ethanac Road	Murrieta Road to Evans Road	4	14	17,715	50	0.5	1.8%	0.6%	64.91	-	99	212	458
11	Ethanac Road	Case Road to I-215 SB Ramps	4	14	25,161	50	0.5	2.1%	0.9%	66.73	61	132	284	611
12	Ethanac Road	I-215 SB Ramps to I-215 NB Ramps	3	0	18,907	50	0.5	2.1%	0.9%	65.26	49	106	229	493
13	Ethanac Road	I-215 NB Ramps to Trumble Road	2	0	14,139	50	0.5	2.1%	0.9%	64.10	40	87	188	404
14	McLaughlin Road	Byers Road to Murrieta Road	2	0	1	45	0.5	1.6%	0.4%	20.85	-	-	-	-
15	Byers Road	Ethanac Road to McLaughlin Road	2	0	1	35	0.5	1.6%	0.4%	18.06	-	-	-	-
16	Wheat Street	Ethanac Road to McLaughlin Road	2	0	1	35	0.5	1.6%	0.4%	18.00	-	-	-	-
17	McCall Blvd.	Murrieta Road to Sun City Blvd	4	0	8,375	35	0.5	1.6%	0.4%	57.45	-	-	68	146
18	McCall Blvd.	Bradley Road to I-215 SB Ramps	4	5	28,352	35	0.5	1.6%	0.4%	62.78	-	71	153	330
19	McCall Blvd.	I-215 SB Ramps to I-215 NB Ramps	4	5	27,453	35	0.5	1.6%	0.4%	62.58	-	70	150	323
20	McCall Blvd.	I-215 NB Ramps to Encanto Drive	4	16	27,638	35	0.5	1.6%	0.4%	62.62	-	71	153	329

[1] Distance is from the centerline of the roadway segment to the receptor location.
"-" = contour is located within the roadway right-of-way.

FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels

Project Name:
Project Number:
Scenario: Opening Year
Ldn/CNEL: CNEL

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

								Vehicle Mix		Distance from Centerline of Roadway				
				Median	ADT	Speed	Alpha	Medium	Heavy	CNEL at	Distance to Contour			
#	**Roadway**	**Segment**	**Lanes**	**Width**	**Volume**	**(mph)**	**Factor**	**Trucks**	**Trucks**	**100 Feet**	**70 CNEL**	**65 CNEL**	**60 CNEL**	**55 CNEL**
1	Case Road	Goetz Road to Murrieta Road	2	0	8,731	55	0.5	1.6%	0.4%	62.51	-	68	147	317
2	Case Road	Murrieta Road to Mapes Road	2	0	6,422	55	0.5	1.6%	0.4%	61.18	-	56	120	258
3	Goetz Road	Case Road to Mapes Road	4	13	9,027	50	0.5	1.6%	0.4%	61.77	-	61	131	283
4	Goetz Road	Mapes Road to Ethanac Road	2	13	13,124	50	0.5	1.6%	0.4%	63.24	-	76	165	354
5	Murrieta Road	Case Road to Ethanac Road	2	0	2,964	45	0.5	1.6%	0.4%	55.56	-	-	51	109
6	Murrieta Road	Ethanac Road to Rouse Road	2	13	13,529	45	0.5	1.6%	0.4%	62.20	-	65	140	302
7	Murrieta Road	Chambers Avenue to McCall Blvd	4	0	13,956	45	0.5	1.6%	0.4%	62.32	-	67	144	311
8	Ethanac Road	Goetz Road to Wheat Street	4	14	20,946	50	0.5	1.6%	0.4%	65.29	-	107	230	495
9	Ethanac Road	Wheat Street to Murrieta Road	4	14	23,868	50	0.5	1.6%	0.2%	65.84	53	114	245	528
10	Ethanac Road	Murrieta Road to Evans Road	4	14	30,680	50	0.5	1.8%	0.6%	67.29	66	142	306	660
11	Ethanac Road	Case Road to I-215 SB Ramps	4	14	42,664	50	0.5	2.1%	0.9%	69.02	87	187	403	869
12	Ethanac Road	I-215 SB Ramps to I-215 NB Ramps	3	0	33,257	50	0.5	2.1%	0.9%	67.71	72	155	333	718
13	Ethanac Road	I-215 NB Ramps to Trumble Road	2	0	25,449	50	0.5	2.1%	0.9%	66.65	60	129	277	598
14	McLaughlin Road	Byers Road to Murrieta Road	2	0	276	45	0.5	1.6%	0.4%	45.26	-	-	-	-
15	Byers Road	Ethanac Road to McLaughlin Road	2	0	2,878	35	0.5	1.6%	0.4%	52.65	-	-	33	70
16	Wheat Street	Ethanac Road to McLaughlin Road	2	0	1	35	0.5	1.6%	0.4%	18.00	-	-	-	-
17	McCall Blvd.	Murrieta Road to Sun City Blvd	4	0	11,550	35	0.5	1.6%	0.4%	58.85	-	-	84	181
18	McCall Blvd.	Bradley Road to I-215 SB Ramps	4	5	33,718	35	0.5	1.6%	0.4%	63.54	-	80	172	371
19	McCall Blvd.	I-215 SB Ramps to I-215 NB Ramps	4	5	33,948	35	0.5	1.6%	0.4%	63.50	-	80	173	372
20	McCall Blvd.	I-215 NB Ramps to Encanto Drive	4	16	34,886	35	0.5	1.6%	0.4%	63.63	-	83	178	384

FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels

Project Name:
Project Number:
Scenario: Opening Year Plus Project
Ldn/CNEL: CNEL

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

								Vehicle Mix		Distance from Centerline of Roadway				
				Median	ADT	Speed	Alpha	Medium	Heavy	CNEL at	Distance to Contour			
#	Roadway	Segment	Lanes	Width	Volume	(mph)	Factor	Trucks	Trucks	100 Feet	70 CNEL	65 CNEL	60 CNEL	55 CNEL
1	Case Road	Goetz Road to Murrieta Road	2	0	8,731	55	0.5	1.6%	0.4%	62.51	-	68	147	317
2	Case Road	Murrieta Road to Mapes Road	2	0	6,499	55	0.5	1.6%	0.4%	61.23	-	56	121	260
3	Goetz Road	Case Road to Mapes Road	4	13	9,291	50	0.5	1.6%	0.4%	61.89	-	62	134	288
4	Goetz Road	Mapes Road to Ethanac Road	2	13	13,520	50	0.5	1.6%	0.4%	63.37	-	78	168	362
5	Murrieta Road	Case Road to Ethanac Road	2	0	3,041	45	0.5	1.6%	0.4%	55.68	-	-	51	111
6	Murrieta Road	Ethanac Road to Rouse Road	2	13	13,886	45	0.5	1.6%	0.4%	62.31	-	66	143	307
7	Murrieta Road	Chambers Avenue to McCall Blvd	4	0	14,378	45	0.5	1.6%	0.4%	62.45	-	68	147	317
8	Ethanac Road	Goetz Road to Wheat Street	4	14	21,518	50	0.5	1.9%	0.8%	65.81	54	116	249	536
9	Ethanac Road	Wheat Street to Murrieta Road	4	14	27,853	50	0.5	1.8%	0.5%	66.83	62	133	285	615
10	Ethanac Road	Murrieta Road to Evans Road	4	14	34,213	50	0.5	1.9%	0.8%	68.01	74	159	342	737
11	Ethanac Road	Case Road to I-215 SB Ramps	4	14	46,215	50	0.5	2.2%	1.1%	69.54	94	203	437	941
12	Ethanac Road	I-215 SB Ramps to I-215 NB Ramps	3	0	35,257	50	0.5	2.2%	1.1%	68.19	77	166	358	772
13	Ethanac Road	I-215 NB Ramps to Trumble Road	2	0	25,801	50	0.5	2.3%	1.2%	67.00	63	136	293	631
14	McLaughlin Road	Byers Road to Murrieta Road	2	0	441	45	0.5	1.6%	0.4%	47.29	-	-	-	-
15	Byers Road	Ethanac Road to McLaughlin Road	2	0	5,884	35	0.5	1.6%	0.4%	55.76	-	-	53	114
16	Wheat Street	Ethanac Road to McLaughlin Road	2	0	1,550	35	0.5	1.6%	0.4%	49.90	-	-	-	47
17	McCall Blvd.	Murrieta Road to Sun City Blvd	4	0	11,807	35	0.5	1.6%	0.4%	58.95	-	-	85	183
18	McCall Blvd.	Bradley Road to I-215 SB Ramps	4	5	33,975	35	0.5	1.6%	0.4%	63.57	-	80	173	373
19	McCall Blvd.	I-215 SB Ramps to I-215 NB Ramps	4	5	34,282	35	0.5	1.6%	0.4%	63.54	-	81	174	375
20	McCall Blvd.	I-215 NB Ramps to Encanto Drive	4	16	35,324	35	0.5	1.6%	0.4%	63.69	-	83	180	387