APPENDIX J

Acoustical Assessment

Kimley»Horn

Acoustical Assessment
Sierra Distribution Facility Project
City of Fontana, California

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LIST OF ABBREVIATED TERMS

APN	Assessor's Parcel Number
ADT	Average daily traffic
dBA	A-weighted sound level
CEQA	California Environmental Quality Act
CLSP	California Landings Specific Plan
CSMA	California Subdivision Map Act
CNEL	Community equivalent noise level
L_{dn}	Day-night noise level
dB	Decibel
du/ac	Dwelling units per acre
L_{eq}	Equivalent noise level
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
HVAC	Heating ventilation and air conditioning
Hz	Hertz
HOA	Homeowner's association
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 Sierra Distribution Facility Project ("Project" or "Proposed 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 and Setting

The Project site is located in northern Fontana, in San Bernardino County (County); Refer to Exhibit 1: Regional Vicinity. The Project site is comprised of six parcels (Assessor's Parcel Numbers [APNs]: 1119-241-10, -13, -18, -25, -26, and -27). The Project site is located at the northeast corner of the intersection of Sierra Avenue and Clubhouse Drive within the City and is bounded to the north and south by existing warehouse/industrial buildings, to the west by Sierra Avenue and residential development, and to the east by Mango Avenue and a landfill; Refer to Exhibit 2: Local Vicinity.

The Project site is bound to the west by Sierra Avenue, to the east by Mango Avenue, and Windflower Avenue enters the Project site from Sierra Avenue. The proposed Project site is presently developed with four commercial/industrial buildings ranging from 5,000 to 25,000 square feet in size. The northwestern quadrant is developed with one building and is utilized as a wooden pallet facility. The northeastern quadrant is developed with one building and is utilized as a carnival attraction repair facility with truck trailer parking. The southwestern quadrant is developed with one building and open-graded gravel pavements and is utilized for truck trailer storage. The southeastern quadrant is developed with one building and is utilized as a storage facility. The existing buildings are single-story, metal-framed structures and are assumed to be supported on conventional shallow foundations with concrete slab-on-grade floors. Ground surface cover consists mainly of open graded gravel and exposed soil, with AC or PCC pavements surrounding the buildings. Little to no vegetation exists on site. Few large trees are present between the northwest and northeast quadrants.

According to available historical sources, the Project site was historically undeveloped vacant land as early as 1896 and was developed in phases from 1982 to 1990. The Project site was historically occupied by light industrial businesses including: All American Pipe & Steel Distribution; Days Express Inc.; Anderson Trucking Services; Apollo Amusement; San Gabriel Valley Lumber & Milling; S.J. Steel Inc.; Active Steel, Inc.; and National Pallets (1987-Present). The Project site is currently occupied by the following businesses:

1.) San Gabriel Valley Lumber & Milling, 6075 Sierra Avenue. This portion of the Project site is located on the northwest and is used for manufacturing of wood molding and repair/ sale of wooden pallets. This property was developed in late 1980s and houses a metal structure and a mobile office.

2.) 5975 Sierra Ave./ 16899 Windflower Avenue. This parcel is located on the southwest portion and is currently unoccupied. This property was last occupied by Anderson Trucking Services for storage and distribution of furniture & was developed in early 1980s and houses a metal structure.

3.) Davis Partners, 17010 Windflower Avenue. This parcel is located on the northeast portion and is currently used for repair of carnival rides. This property was developed in the late 1980s and houses two attached metal structures.

4.) Aluma Systems, 17051 Windflower Avenue. This parcel is located on the southeast portion and is currently used for repair and rent of steel and aluminum scaffolding. This property was developed in 1990 and houses a large metal structure. Two stormwater catch basins are present at this property.

1.2 Project Description

The Project involves the development of a 398,514-square foot[1] warehouse building within an approximately 18.3-acre site, with associated facilities and improvements including approximately 10,000 square feet of office space, vehicle parking, loading dock doors, trailer parking, onsite landscaping, and related onsite improvements; refer to Exhibit 3: Overall Site Plan. The Project would have a Floor Area Ratio (FAR) of 0.45 and can have a maximum FAR of 0.60. Future occupant(s) of the building are not known at this time.

The single building for the Project would maintain a typical height of 43 feet with a maximum height not to exceed 45.5 feet. The maximum building height allowed is approximately 75 feet. The building elevations would be articulated with varying depths of recesses with windows. The paint scheme includes a variable grey and white paint scheme to minimize the bulk and scale of the building with a decorative paint feature in the recesses along the side (east and west) and rear (north) elevations of the building. The dock doors (54) would be centered on the south side of the building.

Land Use and Zoning

The Project is consistent with the City's General Plan land use designation and the zoning. The Project site's industrial land use designation is I-L: Light Industrial and the zoning is M-1: Light Industrial. I-L: Light Industrial (0.1 to 0.6 FAR) allows for employee-intensive uses, including business parks, research and development, technology centers, corporate and support office uses, clean industry, supporting retail uses, truck and equipment sales and related services. Warehouses that are designed in ways that limit off-site impacts are also permitted.

General uses permitted (either by right, minor use permit, or conditional use permit) under the industrial zoning districts (Light Industrial [M-1]) includes manufacturing, food processing, service and repair, storage and open yards, warehousing uses, retail sales, restaurants and bars, administrative and professional offices, educational, and miscellaneous uses.

Landscaping

Landscaping would be provided on approximately 19.8 percent (78,795 square feet) of the Project site. Landscaping would be installed in all areas not devoted to buildings, parking, traffic, and specific user

[1] The analysis herein is based on trip generation for a total of 395,034 square feet. The nominal increase in proposed square footage would not result in appreciable increases in operational emissions.

requirements, in accordance with the City's Zoning and Development Code Section 30-551 which specifies landscape design guidelines for industrial zoning districts.

Project Circulation and Parking

Currently, the Project site is accessible from Windflower Avenue via Sierra Avenue. There is currently not access between the Project site and Mango Avenue.

Regional Project access would be from State Route 210 (SR-210) via the officially designated local truck route, Sierra Avenue. Local access would be provided via Sierra Avenue and Mango Avenue. Project site ingress and egress would be via four driveways: one 40-foot (southerly) driveway and one 35-foot (northerly) driveway on Sierra Avenue and one 40-foot (southerly) driveway and one 35-foot (northerly) driveway on Mango Avenue. Trucks would enter the site via northbound Sierra Avenue and exit the site via southbound Mango Avenue. Mango Avenue intersects with Sierra Lakes Parkway which reconnects with Sierra Avenue. Trucks would access southbound Sierra Avenue from this point to reach SR-210 and regional destinations beyond.

The Project would provide 132 parking stalls, 81 trailer stalls, and 37 tractor trailer stalls. Additionally, a total of 54 dock doors would be provided. Parking stalls would be provided as follows:

• Standard = 98 stalls • ADA Standard = 5 stalls • ADA Van = 1 stall • EV ADA Van = 1 stall	• EV Charging Only = 21 stalls • EV ADA = 1 stalls • EV Ambulance = 0 stalls • Carpool/Vanpool/EV = 5 stalls

The Project would require a 34-foot right-of-way dedication for Mango Avenue.

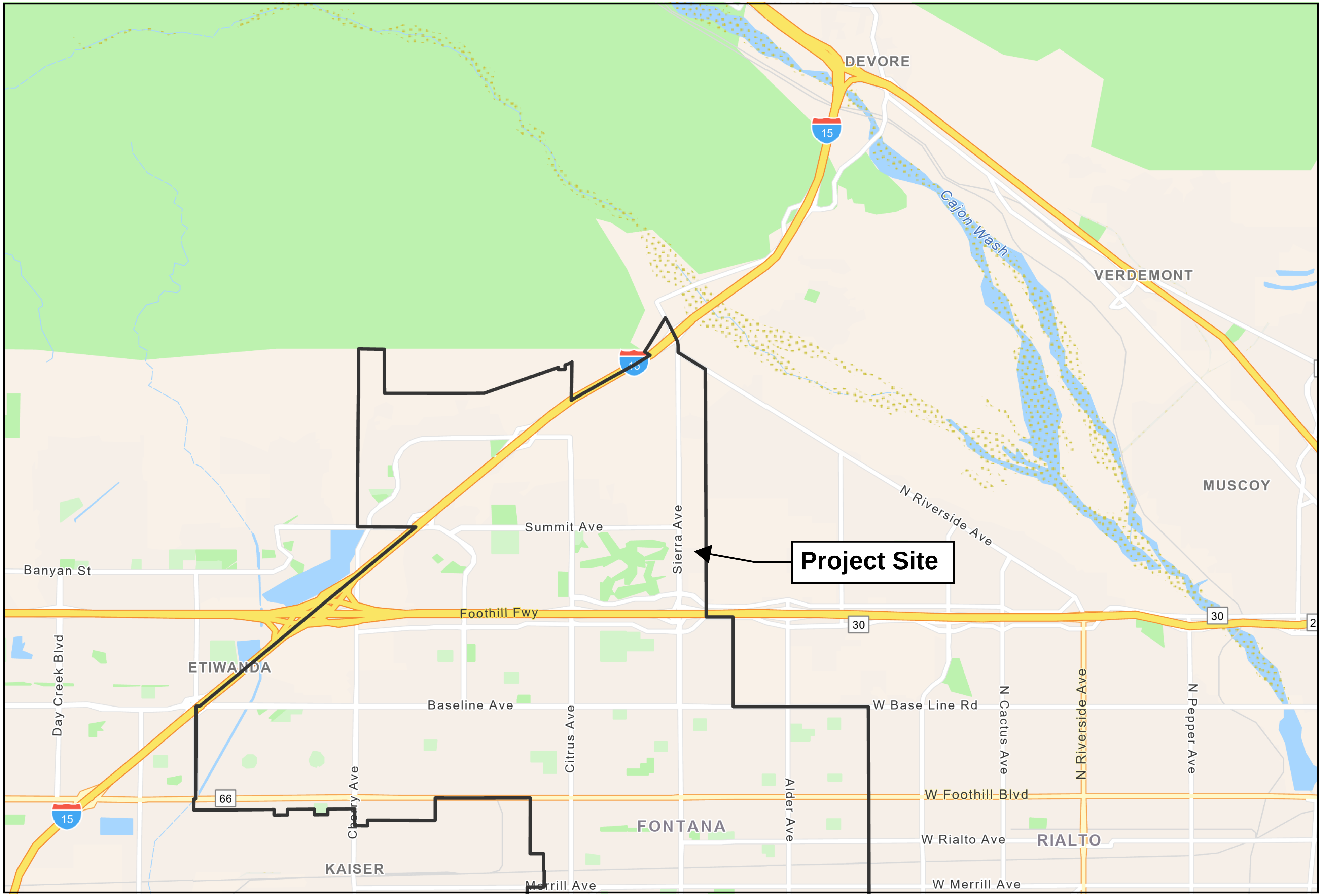
Project Phasing and Construction

The Project is anticipated to be developed in one phase. Should the Project be approved, construction is anticipated to occur over a duration of approximately 15 months, commencing in summer of 2024; the facility would be operational in fall of 2025. New construction would include: (1) demolition, (2) grading/removal of concrete, (3) building construction, (4) paving, (5) architectural coating, (6) landscaping, and the applicable off-site improvements conditioned by the City consisting of standard curb and gutter improvements.

Grading and Utilities

The following describes grading and utility work to be completed for the Project. The Project site is relatively flat but would require grading to achieve the needed slopes and contour to facilitate building design and connections to existing utilities. The existing site topography generally slopes downward to the south at a gradient of 3± percent. The Project site would maintain the same general drainage pattern and would be graded to conduct runoff to the new drainage facilities that would be constructed as part of the Project. It is anticipated that the site would be graded to balance on-site, eliminating the need for off-site soils hauling.

Overhead SCE powerlines are present along the northern, southern, and western property lines of the Project site. The overhead powerlines would be removed from their existing location and undergrounded. The applicant would work with SCE to tie into, relocate, and extend services into the site as required.



Source: ESRI, 2022

EXHIBIT 1: Regional Vicinity

Sierra Distribution Facility Project, City of Fontana

Not to scale

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Source: ESRI, 2022

EXHIBIT 2: Local Vicinity

Sierra Distribution Facility Project, City of Fontana

Not to scale

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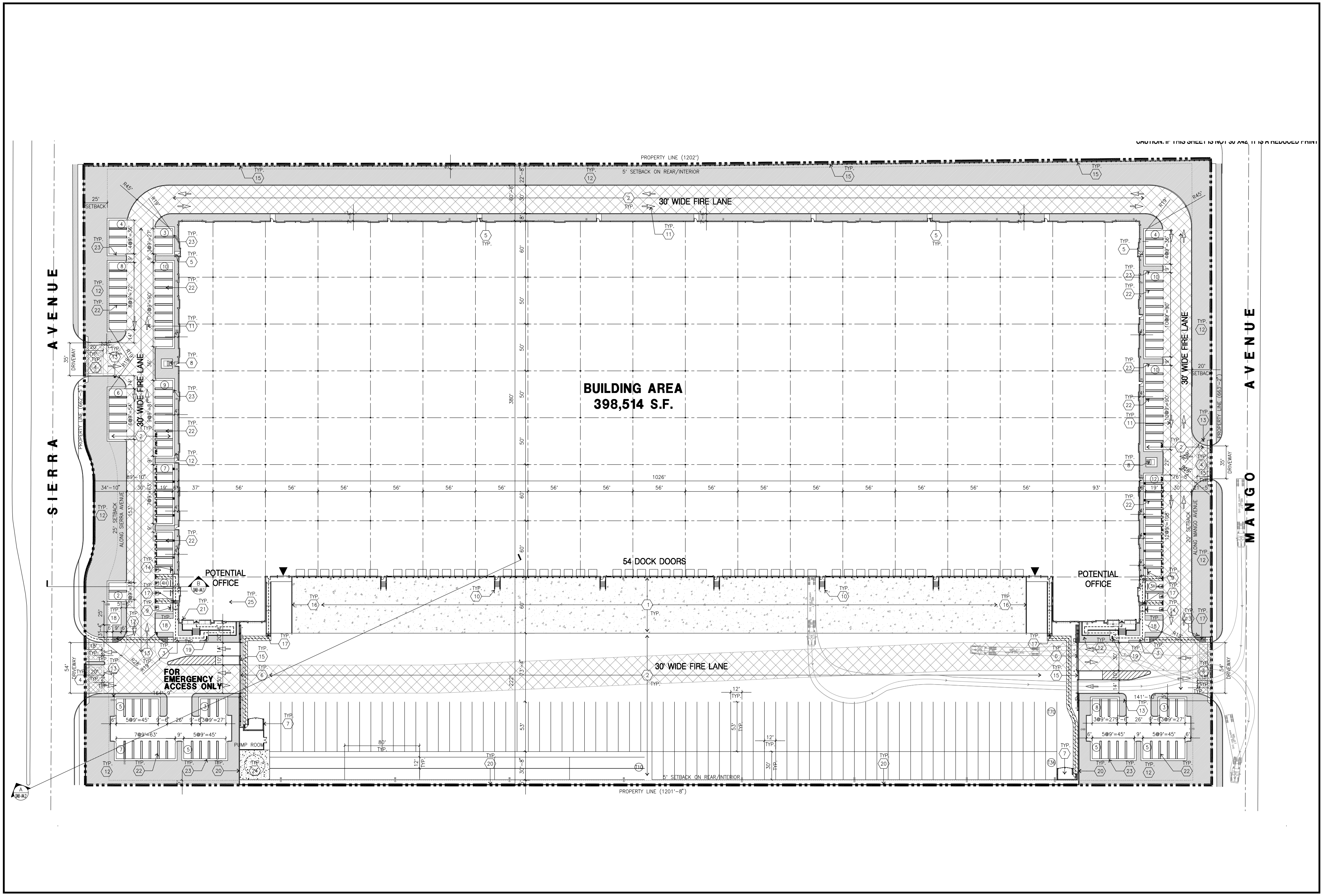

Source: HPA Architecture, 1/3/2023

EXHIBIT 3: Overall Site Plan

Sierra Distribution Facility Project, City of Fontana

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. 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 ambient noise that is the sum of many distant and indistinguishable noise sources. Superimposed on this ambient 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 micro-pascals (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 equivalent 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 sound energy 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 pascal 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.[2] 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.[3] Under the dB scale, three sources of equal loudness together would produce an increase of approximately 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.[4] 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.

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.[5] The way older homes in California were constructed generally

2 FHWA, *Noise Fundamentals,* 2017. Available at: https://www.fhwa.dot.gov/environMent/noise/regulations_and_guidance/polguide/polguide02.cfm
3 Ibid.
4 California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, Page 2-29, September 2013.
5 James P. Cowan, *Handbook of Environmental Acoustics,* 1994.

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.[6] 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[7]:

- 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 just-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

[6] Compiled from James P. Cowan, *Handbook of Environmental Acoustics,* 1994 and Cyril M. Harris, Handbook of Noise Control, 1979.

[7] Compiled from California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, September 2013, and FHWA, *Noise Fundamentals,* 2017.

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[8].

2.2 Ground-Borne Vibration

Sources of ground-borne 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 or heavy equipment use during construction). 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 vibration decibels (VdB) (the vibration velocity level in decibel scale). Other methods are the peak particle velocity (PPV) and 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 ground-borne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

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 ground-borne vibration are planes, trains, and construction activities 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.

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

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.

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 Manual (FTA Transit Noise and Vibration Manual) 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 report establishes a threshold of 80 dBA (8-hour L_{eq}) for residential uses and 90 dBA (8-hour L_{eq}) for non-residential uses to evaluate construction noise impacts.[9] 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.

Title 24 – Building Code

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, 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, the acceptable interior noise limit for new construction is 45 dBA CNEL.

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

3.3 Local

City of Fontana General Plan

Adopted on November 13, 2018, the Fontana Forward General Plan Update 2015-2035 (Fontana General Plan) identifies noise standards that are used as guidelines to evaluate transportation noise level impacts. These standards are also used to assess the long-term traffic noise impacts on specific land uses. According to the Fontana General Plan, land uses such as residences have acceptable exterior noise levels of up to 65 dBA CNEL. Based on the guidelines in the Fontana General Plan, an exterior noise level of 65 dBA CNEL is generally considered the maximum exterior noise level for sensitive receptors.

Land uses near these significant noise-producers can incorporate buffers and noise control techniques including setbacks, landscaping, building transitions, site design, and building construction techniques to reduce the impact of excessive noise. Selection of the appropriate noise control technique would vary depending on the level of noise that needs to be reduced as well as the location and intended land use. The City has adopted the Noise and Safety Element as a part of the updated Fontana General Plan. The Noise and Safety Element specifies the maximum allowable unmitigated exterior noise levels for new developments impacted by transportation noise sources. Additionally, the Noise and Safety Element identifies transportation noise policies designed to protect, create, and maintain an environment free of harmful noise that could impact the health and welfare of sensitive receptors. The following Fontana General Plan goals, policies, and actions for addressing noise are applicable to the Project:

Goal 8: The City of Fontana protects sensitive land uses from excessive noise by diligent planning through 2035.

Policy 8.2: Noise-tolerant land uses shall be guided into areas irrevocably committed to land uses that are noise-producing, such as transportation corridors.

Policy 8.4: Noise spillover or encroachment from commercial, industrial and educational land uses shall be minimized into adjoining residential neighborhoods or noise-sensitive uses.

Action C: The State of California Office of Planning and Research General Plan Guidelines shall be followed with respect to acoustical study requirements.

Goal 9: The City of Fontana provides a diverse and efficiently operated ground transportation system that generates the minimum feasible noise on its residents through 2035.

Policy 9.1: All noise sections of the State Motor Vehicle Code shall be enforced.

Policy 9.2: Roads shall be maintained such that the paving is in good condition and free of cracks, bumps, and potholes.

Action A: On-road trucking activities shall continue to be regulated in the City to ensure noise impacts are minimized, including the implementation of truck-routes based on traffic studies.

Action B: Development that generates increased traffic and subsequent increases in the ambient noise level adjacent to noise-sensitive land uses shall provide appropriate mitigation measures.

Action D: Explore the use of “quiet pavement” materials for street improvements.

Goal 10: Fontana's residents are protected from the negative effects of "spillover" noise.

Policy 10.1: Residential land uses and areas identified as noise-sensitive shall be protected from excessive noise from non-transportation sources including industrial, commercial, and residential activities and equipment.

Action A: Projects located in commercial areas shall not exceed stationary-source noise standards at the property line of proximate residential or commercial uses.

Action B: Industrial uses shall not exceed commercial or residential stationary source noise standards at the most proximate land uses.

Action C: Non-transportation noise shall be considered in land use planning decisions.

Action D: Construction shall be performed as quietly as feasible when performed in proximity to residential or other noise sensitive land uses.

City of Fontana Municipal Code

Standards established under the City of Fontana Municipal Code (Municipal Code) are used to analyze noise impacts originating from the Project. Operational noise impacts are typically governed by Fontana Municipal Code Sections 18-61 through 18-67. Guidelines for non-transportation and stationary noise source impacts from operations at private properties are found in the Zoning and Development Code in Chapter 30 of the Fontana Municipal Code. Applicable guidelines indicate that no person shall create or cause any sound exceeding the City's stated noise performance standards measured at the property line of any residentially zoned property. Per Fontana Municipal Code Section 30-543(A), the performance standards for exterior noise emanating from industrial uses are 70 dBA between the hours of 7:00 a.m. and 10:00 p.m. and 65 dBA during the noise-sensitive hours of 10:00 p.m. to 7:00 a.m. at residential uses. For this analysis, a 65-dBA nighttime noise level standard is conservatively used to analyze potential noise impacts at off-site residential receptors within the City of Fontana.

The City has also set restrictions to control noise impacts from construction activities. Section 18-63(b)(7) states that the erection (including excavation), demolition, alteration, or repair of any structure shall only occur between the hours of 7:00 a.m. and 6:00 p.m. on weekdays and between the hours of 8:00 a.m. and 5:00 p.m. on Saturdays, except in the case of urgent necessity or otherwise approved by the City of Fontana. Although the Fontana Municipal Code limits the hours of construction, it does not provide specific noise level performance standards for construction.

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

The predominant mobile noise source in the Project area is the traffic noise along Sierra Avenue which is located directly west of the Project Site. Sierra Lakes Parkway and SR-210 are approximately 0.36-mile and 0.58-mile to the south of the Project site, respectively.

Stationary Sources

The primary sources of stationary noise in the Project vicinity are those associated with the operations of adjacent warehouse uses to the north and south of the Project, landfill operations located to the east of the Project, and residential land uses to the west of the Project. The noise associated with these sources may represent a single-event noise occurrence or short-term noise. Other noises include mechanical equipment (e.g., heating ventilation and air conditioning [HVAC] equipment), dogs barking, idling vehicles, and residents talking.

4.2 Noise Measurements

To quantify existing ambient noise levels in the Project area, Kimley-Horn conducted five short-term noise measurements on August 24th, 2022; see Appendix A: Noise Data. 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 9:00 a.m. and 11:00 a.m. near potential sensitive receptors. Short-term L_{eq} measurements are considered representative of the noise levels throughout the day. The noise levels and sources of noise measured at each location are listed in Table 4: Existing Noise Measurements.

Table 4: Existing Noise Measurements

Site	Location	L_{eq} (dBA)	L_{min} (dBA)	L_{max} (dBA)	Time
1	End of cul-de-sac on Camargo Place	65.3	50.1	81.3	9:10 a.m.
2	End of cul-de-sac on Olympic Court	50.5	45.1	58.5	9:30 a.m.
3	End of cul-de-sac on Mango Avenue	67.0	47.6	87.5	9:50 a.m.
4	Southeast corner of Project site along Mango Avenue	65.3	52.6	82.7	10:05 a.m.
5	Past the entrance on Windflower Avenue within Project site	65.3	50.1	81.3	10:23 a.m.

Source: Noise measurements taken by Kimley-Horn, August 24th, 2022. See Appendix A for noise measurement results.

4.3 Sensitive Receptors

Sensitive populations are more susceptible to the effects of noise pollution than is the general population. Sensitive receptors that are in proximity to stationary sources of noise and vibration are of particular concern. Land uses considered sensitive receptors include residences, schools, playgrounds, childcare centers, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. Sensitive land uses surrounding the Project consist mostly of single-family residential communities, a middle school, and a high school. Sensitive land uses nearest to the Project are shown in Table 5: Sensitive Receptors.

Table 5: Sensitive Receptors

Receptor Description	Distance and Direction from the Project
Single-Family Residences	130 feet to the west
Single-Family Residences	1,385 feet to the north
Single-Family Residences	3,440 feet to the south
Wayne Ruble Middle School	4,880 feet to the southwest
A.B. Miller High School	5,000 feet to the southwest
Source: Google Earth, 2022.	

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

Construction

Construction noise levels were based on typical noise levels generated by construction equipment published by the Federal Transit Administration (FTA) and 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.

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). Noise level estimates do not account for the presence of intervening structures or topography, which may reduce noise levels at receptor locations. Therefore, the noise levels presented herein represent a conservative, reasonable worst-case estimate of actual temporary construction noise.

Operations

The analysis of the Opening Year 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 were collected from published sources from similar types of activities and 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 noise standards and General Plan.

Vibration

Ground-borne vibration levels associated with construction 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 structural damage and human annoyance.

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

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 the residential neighborhoods located to the west of the construction site. Existing residential uses are located approximately 130 feet from the Project construction area. However, 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 could require concrete/industrial saws, excavators, and dozers during demolition; dozers and tractors during site preparation; excavators, graders, and dozers during grading; cranes, forklifts, generators, tractors, and welders during building construction; pavers, rollers, mixers, 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). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. Typical noise levels associated with individual construction equipment are listed in Table 6: Typical Construction Noise Levels.

Table 6: Typical Construction Noise Levels

Equipment	Typical Noise Level (dBA) at 50 feet from Source	Typical Noise Level (dBA) at 130 feet from Source[1]
Air Compressor	80	74
Backhoe	80	74
Compactor	82	76
Concrete Mixer	85	79
Concrete Pump	82	76
Concrete Vibrator	76	70
Crane, Derrick	88	82
Crane, Mobile	83	77
Dozer	85	79
Generator	82	76
Grader	85	79
Impact Wrench	85	79
Jack Hammer	88	82
Loader	80	74

Table 6: Typical Construction Noise Levels		
Equipment	**Typical Noise Level (dBA) at 50 feet from Source**	**Typical Noise Level (dBA) at 130 feet from Source[1]**
Paver	85	79
Pile-driver (Impact)	101	95
Pile-driver (Sonic)	95	89
Pneumatic Tool	85	79
Pump	77	71
Roller	85	79
Saw	76	70
Scraper	85	79
Shovel	82	76
Truck	84	78

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.

As shown in Table 6, exterior noise levels could affect the nearest existing sensitive receptors (130 feet to the west) in the vicinity. Sensitive uses in the Project site vicinity include existing residential uses to the west, north, and south, Wayne Ruble Middle School to the southwest, and A.B. Miller High School to the southwest. These sensitive receptors may be exposed to elevated noise levels during Project construction. Following FTA's methodology for quantitative construction noise assessments, FHWA's Roadway Construction Noise Model (RCNM) was used to predict construction noise. Per the FTA Transit Noise and Vibration Manual which provides guidance for construction noise analyses, when calculating construction noise, all construction equipment is assumed to operate simultaneously at the center of the active construction zone. Under realistic circumstances, equipment would be operating throughout the site during a workday. Multiple pieces of equipment could not realistically be operating at the same time at the same point closest to a specific sensitive receptor. Additionally, there may be instances where multiple types of equipment would not be operated simultaneously. Therefore, assuming the distance between the center of the Project site and a sensitive receptor would account for average noise levels as construction equipment move through the Project site and would be a reasonable assumption. Therefore, the distance used in the RCNM model was approximately 730 from the center of the Project site to the nearest sensitive receptor (residential uses to the west) where every piece of construction equipment assumed for each individual phase is assumed to operate simultaneously; refer to Appendix A for RCNM modeling results.

The noise levels calculated in Table 7: Project Construction Noise Levels, show the exterior construction noise at the nearest sensitive receptor without accounting for attenuation from existing physical barriers. Noise generated during the construction, paving, and painting stages, which have the potential to occur simultaneously, were added together to provide a composite construction noise level. The City of Fontana does not establish quantitative construction noise standards; therefore, this analysis conservatively uses the FTA's threshold of 80 dBA (8-hour L_{eq}) for residential uses to evaluate construction noise impacts.[10] As shown in Table 7, construction noise levels would not exceed the applicable FTA construction thresholds. The highest exterior noise level at the nearest residential receptors would occur during the

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

overlap of building construction, paving, and architectural coating stages and would be 67.8 dBA which is below the FTA's 80 dBA threshold.

It is noted that construction noise would be acoustically dispersed throughout the Project site and not concentrated in one area near surrounding sensitive uses. Further, the City's Municipal Code does not establish quantitative construction noise standards. Instead, the Municipal Code establishes limited hours of construction activities. Municipal Code Section 18-63 states that construction activities may only take place between the hours of 7:00 a.m. and 6:00 p.m. on weekdays and between the hours of 8:00 a.m. and 5:00 p.m. on Saturdays, except in the case of urgent necessity or otherwise approved by the City of Fontana. All motorized equipment used in such activity shall be equipped with functioning mufflers as mandated by the state.

Table 7: Project Construction Noise Levels

Construction Phase	Receptor Location		Worst Case Modeled Exterior Noise Level (dBA L_{eq})	Noise Threshold (dBA L_{eq})	Exceeded?
	Land Use	Distance (feet)[1]			
Demolition	Residential	730	63.2	80	**No**
Site Preparation	Residential	730	64.3	80	**No**
Grading	Residential	730	64.9	80	**No**
Infrastructure	Residential	730	66.1	80	**No**
Building Construction	Residential	730	66.1	80	**No**
Paving + Architectural Coating	Residential	730	63.1	80	**No**
Building Construction + Paving + Architectural Coating	Residential	730	67.8	80	**No**

Note:
1. Distance measured from the center of the project site to the receptor's nearest property line.
Source: Federal Highway Administration, *Roadway Construction Noise Model,* 2006. Refer to Appendix A for noise modeling results.

Construction activities may also cause increased noise along site access routes due to movement of equipment and workers. Compliance with the Municipal Code would minimize impacts from construction noise, as construction would be limited to daytime hours on weekdays and Saturdays.

As discussed above, construction noise levels from the Project would not exceed the FTA's construction noise thresholds and would be required to comply with the Municipal Code standards. Therefore, there is a less than significant noise impact for construction activities.

Operations

Implementation of the proposed project would create new sources of noise in the project vicinity. The major noise sources associated with the project including the followings:

- 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);
- Back-up alarms;
- Parking areas (i.e., car door slamming, car radios, engine start-up, and car pass-by); and
- Off-Site Traffic Noise.

Mechanical Equipment. The nearest sensitive receptors to the Project site are the residences 130 feet west of the Project site. 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.[11] At the closest sensitive receptors located approximately 130 feet away, mechanical equipment noise would attenuate to 43.7 dBA, which is below the City's 65 dBA standard. Operation of mechanical equipment would not increase ambient noise levels beyond the acceptable compatible land use noise levels. Therefore, the proposed Project would result in a less than significant impact related to stationary noise levels.

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. Loading or unloading activities would occur on the south side of the Project site. Vehicular access to the proposed Project site would consist of two driveways along Sierra Avenue and one driveway along Mango Avenue at the west and east side of the Project site respectively. Typically, heavy truck operations generate a noise level of 64.4 dBA at a distance of 50 feet.[12] The closest residences are located approximately 290 feet west of the nearest proposed loading areas. These closest residences would experience truck noise levels of approximately 49.1 dBA, which is below the City's acceptable limits of 65 dBA for residential noise. Additionally, these noise levels would also be further attenuated by the intervening structures. 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.

Back-Up Alarms**.** Medium and heavy-duty trucks reversing into loading docks would produce noise from back-up alarms (also known as back-up beepers). Back-up beepers produce a typical volume of 97 dBA at one meter from the source.[13] The property line of the nearest sensitive receptor would be located approximately 130 feet west of the project driveway where trucks could be reversing and maneuvering into the loading area. At this distance, exterior noise levels from back-up beepers would be approximately 64 dBA, which is below the City's acceptable limits of 65 dBA for residential noise.

Parking Noise. The Project would provide 132 parking stalls, 81 trailer parking stalls, 37 tractor triler stalls, and 54 loading spaces. Parking stalls would be located on the west, south, and east of the proposed warehouse building near the site perimeter. 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

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

12 Loading dock reference noise level measurements conducted by Kimley-Horn on December 18, 2018 at the La Palma Neighborhood Walmart, approximately 50 feet from the Walmart loading dock area. Loading dock activities included trucks arriving at the docks, backing up, and loading/unloading using palette jacks.

13 Environmental Health Perspectives, *Vehicle Motion Alarms: Necessity, Noise Pollution, or Both?* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3018517/, accessed September 2022.

53 to 61 dBA[14] at 50 feet and may be an annoyance to adjacent noise-sensitive receptors. Conversations in parking areas may also be an annoyance to nearby 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.[15] 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.

Parking lot noise would occur within the surface parking lot on-site and would be up to 52.7 dBA at the nearest sensitive receptors located approximately 130 feet away which is below the City's 65 dBA residential standard. Parking lot noise also currently occurs at the adjacent properties under existing conditions. Parking lot noise would be consistent with the existing noise in the vicinity and would be partially masked by background noise from traffic along Sierra Avenue. Noise associated with parking lot activities is not anticipated to exceed the City's noise standards during operation. Therefore, noise impacts from parking lots would be less than significant.

Off-Site Traffic Noise. Implementation of the Project would generate increased traffic volumes along nearby roadway segments. According to the Trip Generation Assessment and Traffic Scoping prepared by Kimley Horn (August 16, 2022), the proposed Project would generate 681 daily trips that would result in noise increases on Project area roadways. In general, a traffic noise increase of less than 3 dBA is barely perceptible to people, while a 5-dBA increase is readily noticeable.[16] Generally, traffic volumes on Project area roadways would have to approximately double for the resulting traffic noise levels to increase by 3 dBA. Therefore, permanent increases in ambient noise levels of less than 3 dBA are considered to be less than significant.

Traffic noise levels for roadways primarily affected by the Project were calculated using the FHWA's Highway Noise Prediction Model (FHWA-RD-77-108). Traffic noise modeling was conducted for conditions with and without the Project, based on traffic volumes from the Traffic Impact Analysis. As indicated in Table 8: Existing and Project Traffic Noise Levels, Existing Plus Project traffic-generated noise levels on Project area roadways would range between 66.2 dBA CNEL and 73.3 dBA CNEL at 100 feet from the roadway centerline, and the Project would result in a maximum increase of 0.1 dBA CNEL along Sierra Lakes Parkway and Sierra Avenue.

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14 Kariel, H. G., *Noise in Rural Recreational Environments*, Canadian Acoustics 19(5), 3-10, 1991.

15 Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, 2015.

16 Federal Highway Administration, *Highway Traffic Noise Analysis and Abatement Policy and Guidance, Noise Fundamentals*, https://www.fhwa.dot.gov/environMent/noise/regulations_and_guidance/polguide/polguide02.cfm, accessed March 11, 2020.

Table 8: Existing and Project Traffic Noise Levels

Roadway Segment	Existing		Existing Plus Project		Project Change from Existing Conditions	Significant Impact?
	ADT[1]	dBA CNEL[2]	ADT	dBA CNEL[2]		
Sierra Avenue						
North of Summit Ave	11,600	68.4	11,736	68.5	0.1	**No**
Between Summit Ave and parcel	19,000	70.6	19,306	70.7	0.1	**No**
Between parcel and Clubhouse Dr	19,000	70.6	19,306	70.7	0.1	**No**
Between Clubhouse Dr and Sierra Lakes Parkway	18,900	70.6	19,036	70.6	0.0	**No**
South of Sierra Lakes Pkwy	34,700	73.3	35,108	73.3	0.0	**No**
Sierra Lakes Parkway						
West of Sierra Ave	16,000	69.8	16,408	69.9	0.1	**No**
Between Sierra Ave and Mango Ave	16,000	69.8	16,408	69.9	0.1	**No**
Summit Avenue						
West of Sierra Ave	6,900	66.2	6,934	66.2	0.0	**No**

ADT = average daily trips; dBA = A-weighted decibels; CNEL= Community Equivalent Noise Level
1. Existing ADT from City of Fontana General Plan Update 2015-2035 Draft EIR, Future 5.13-3 Existing (2017) ADT Volumes
2. Traffic noise levels are at 100 feet from the roadway centerline.

Source: Based on traffic data provided by Kimley-Horn and Associates, Inc., 2022. Refer to Appendix A for traffic noise modeling results.

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?

Increases in ground-borne vibration levels attributable to the proposed Project would be primarily associated with short-term construction-related activities. 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 Federal Transit Administration (FTA) has published standard vibration velocities for construction equipment operations in their 2018 *Transit Noise and Vibration Impact Assessment Manual*. The types of construction vibration impacts include human annoyance and building damage. 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 (80 VdB annoyance threshold). 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 9: Typical Construction Equipment Vibration Levels, lists vibration levels at 25 feet and 130 feet for typical construction equipment. Ground-borne vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. As indicated in Table 9, based on FTA data, vibration velocities from typical heavy construction equipment operations that would be used during Project construction range from 0.0003 to 0.0075 in/sec PPV at 130 feet from the source of activity (the distance from active construction zone to the nearest residential uses to the west), which is below the FTA's 0.20 PPV threshold.

Table 9: Typical Construction Equipment Vibration Levels

Equipment	Peak Particle Velocity at 25 Feet (in/sec)	Peak Particle Velocity at 130 Feet (in/sec)[1]	Approximate VdB at 25 Feet	Approximate VdB at 130 Feet[2]
Large Bulldozer	0.089	0.0075	87	66
Caisson Drilling	0.089	0.0075	87	66
Loaded Trucks	0.076	0.0064	86	65
Jackhammer	0.035	0.0030	79	58
Small Bulldozer/Tractors	0.003	0.0003	58	37

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.
2. Calculated using the following formula: Lv(D) = Lv(25 feet) - (30 x log10(D/25 feet)) per the FTA Transit Noise and Vibration Impact Assessment Manual (2018).

Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, 2018.

In addition, construction VdB levels would be 66 VdB at 130 feet and would not exceed the FTA's 80 VdB annoyance threshold; see Table 9. 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 residential structure(s). Therefore, vibration impacts associated with the Project construction would be less than significant.

Once operational, the Project would not be a significant source of ground-borne vibration. Ground-borne vibration surrounding the Project currently result from heavy-duty vehicular travel (e.g., refuse trucks, heavy duty trucks, delivery trucks, and transit buses) on the nearby local roadways. Operations of the proposed Project would include truck deliveries. Due to the rapid drop-off rate of ground-borne vibration and the short duration of the associated events, vehicular traffic-induced ground-borne vibration is rarely perceptible beyond the roadway right-of-way, and rarely results in vibration levels that cause damage to buildings in the vicinity. According to the FTA's Transit Noise and Vibration Impact Assessment, trucks rarely create vibration levels that exceed 70 VdB (equivalent to 0.012 inches per second PPV) when they are on roadways. Therefore, trucks operating at the Project site or along surrounding roadways would not exceed FTA thresholds for building damage or annoyance. Impacts would be less than significant in this regard.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

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 nearest airport to the Project site is the Ontario International Airport located approximately 10.2 miles to the southwest. The Project is not within 2.0 miles of a public airport or within an airport land use plan. Additionally, there are no private airstrips located within the Project vicinity. Therefore, the Project would not expose people residing or 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 substantial 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 construction activities were conducted concurrently. However, based on the noise analysis above, the Project's construction-related noise impacts would be less than significant following the City of Fontana Municipal Code.

Construction activities at other planned and approved projects near the Project site would be required to comply with applicable City rules 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, assuming such a cumulative impact existed, and impacts in this regard are not cumulatively considerable.

Cumulative Operational Noise

<u>Cumulative Off-Site Traffic Noise.</u> Cumulative noise impacts describe how much noise levels are projected to increase over existing conditions with the development of the Project and other foreseeable projects. Cumulative noise impacts generally occur as a result of increased traffic on local roadways due to buildout of the Project and other projects in the vicinity. A project's contribution to a cumulative traffic noise increase would be considered significant when the combined effect exceeds the 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.

- *<u>Combined Effect</u>.* The cumulative with Project noise level 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 a 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 project.

- *Incremental Effects*. The cumulative plus project noise level causes a 1.0 dBA increase in noise over cumulative noise levels without a project.

A significant impact would result only if 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 Project and growth due to occur in the general area would contribute to cumulative noise impacts.

The proposed Project is projected to result in 287 net new daily vehicular trips and would result in a minimal traffic noise increase (max increase of 0.1 dBA) along local roadways over existing conditions as shown in Table 8. The already minimal increase in traffic noise attributable to the proposed Project when compared to existing conditions would be even lower with consideration of additional trips from future development on cumulative development sites. The Project would not result in significant traffic noise impacts. Therefore, the Project's contribution to cumulative increases in traffic noise would not be cumulatively considerable.

Cumulative Stationary Noise. Stationary noise sources of the proposed Project would result in an incremental increase in non-transportation noise sources in the Project vicinity. However, as discussed above, operational noise caused by the proposed Project would be less than significant. Similar to the proposed Project, other planned and approved projects would be required to mitigate for stationary noise impacts at nearby sensitive receptors, if necessary. As stationary noise sources are generally localized, there is a limited potential for 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.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

7 REFERENCES

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3. California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, 2013.
4. California Department of Transportation, *Transportation Related Earthborne Vibrations*, 2002.
5. California Department of Transportation, *Transportation and Construction Vibration Guidance Manual*, 2013.
6. California Department of Transportation, *Transportation and Construction Vibration Guidance Manual,* 2020
7. City of Fontana, *General Plan*, 2018.
8. City of Fontana, *Municipal Code*, 2018.
9. Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values*, July 6, 2010
10. Environmental Health Perspectives, *Vehicle Motion Alarms: Necessity, Noise Pollution, or Both?* https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3018517/, accessed September 2022.
11. Federal Highway Administration, *Noise Fundamentals,* 2017.
12. Federal Highway Administration, *Roadway Construction Noise Model*, 2006.
13. Federal Highway Administration, *Roadway Construction Noise Model User's Guide Final Report*, 2006.
14. Federal Interagency Committee on Noise, *Federal Agency Review of Selected Airport Noise Analysis Issues*, 1992.
15. Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, 2018.
16. James P. Cowan, *Handbook of Environmental Acoustics,* 1994
17. United States Environmental Protection Agency, *Protective Noise Levels (EPA 550/9-79-100)*, 1979.

Appendix A

NOISE DATA

Noise Measurement Field Data

Project:	Fontana Sierra Distribution Facility	Job Number:	195170026
Site No.:	ST-1	Date:	8/24/2022
Analyst:	Kiera Pascua and Steven Yu	Time:	9:10 - 9:20 AM
Location:	End of cul-de-sac on Camargo Place		
Noise Sources:	Distant traffic, birds		
Comments:			

Results (dBA):

	Leq:	Lmin:	Lmax:	Peak:
Measurement 1:	53.3	45.0	60.5	84.5

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

Weather	
Temp. (degrees F):	80
Wind (mph):	< 5
Sky:	Clear
Bar. Pressure:	29.84 inHg
Humidity:	52%

Photo:

Kimley»Horn

Summary			
File Name on Meter	FONT.001.s		
File Name on PC	LxTse_0007061-20220824 091052-FONT.001.ldbin		
Serial Number	0007061		
Model	SoundExpert® LxT		
Firmware Version	2.404		
User			
Location			
Job Description			
Note			

Measurement			
Description			
Start	2022-08-24 09:10:52		
Stop	2022-08-24 09:20:52		
Duration	00:10:00.0		
Run Time	00:10:00.0		
Pause	00:00:00.0		
Pre-Calibration	2022-08-23 17:05:18		
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	122.6 dB		
	A	C	Z
Under Range Peak	79.2	76.2	81.2 dB
Under Range Limit	24.3	25.3	31.5 dB
Noise Floor	15.1	16.2	22.4 dB
	First	Second	Third
Instrument Identification	ıley-Horn and Associates	Town&Country Rd, #700	Orange, CA 92868

Results

LAeq	53.3 dB					
LAE	81.1 dB					
EA	14.253 µPa²h					
LApeak (max)	2022-08-24 09:11:19	84.5 dB				
LASmax	2022-08-24 09:11:19	60.5 dB				
LASmin	2022-08-24 09:11:14	45.0 dB				
SEA	-99.9 dB					
	Exceedance Counts	Duration				
LAS > 85.0 dB	0	0.0 s				
LAS > 115.0 dB	0	0.0 s				
LApeak > 135.0 dB	0	0.0 s				
LApeak > 137.0 dB	0	0.0 s				
LApeak > 140.0 dB	0	0.0 s				
Community Noise	Ldn	LDay 07:00-22:00	LNight 22:00-07:00	Lden	LDay 07:00-19:00	LEvening 19:00-22:00
	53.3	53.3	-99.9	53.3	53.3	-99.9
LCeq	72.8 dB					
LAeq	53.3 dB					
LCeq - LAeq	19.5 dB					
LAIeq	55.2 dB					
LAeq	53.3 dB					
LAIeq - LAeq	1.9 dB					

	A		C		Z	
	dB	Time Stamp	dB	Time Stamp	dB	Time Stamp
Leq	53.3		72.8			
LS(max)	60.5	2022/08/24 9:11:19				
LS(min)	45.0	2022/08/24 9:11:14				
LPeak(max)	84.5	2022/08/24 9:11:19				

Overload Count	0
Overload Duration	0.0 s
OBA Overload Count	0
OBA Overload Duration	0.0 s

Statistics

LA 5.00	57.1 dB
LA 10.00	55.6 dB
LA 33.30	53.4 dB
LA 50.00	52.2 dB
LA 66.60	51.3 dB
LA 90.00	50.3 dB

Calibration History

Preamp	Date	dB re. 1V/Pa	6.3	8.0	10.0
PRMLxT1L	2022-08-23 17:05:17	-28.86	72.23	67.38	52.44
PRMLxT1L	2022-08-17 11:26:02	-28.89	65.51	67.15	63.95
PRMLxT1L	2022-08-16 15:37:51	-28.74	42.60	61.02	61.06
PRMLxT1L	2022-08-09 16:00:21	-28.86	51.28	58.57	50.94
PRMLxT1L	2022-08-03 10:37:30	-28.67	77.56	66.31	69.99
PRMLxT1L	2022-08-02 14:52:32	-29.25	63.71	67.15	67.78
PRMLxT1L	2022-07-27 11:29:48	-28.66	66.62	59.22	92.15
PRMLxT1L	2022-07-27 11:13:44	-28.62	27.52	36.01	53.09
PRMLxT1L	2022-07-26 16:22:40	-28.86	56.89	60.40	57.01
PRMLxT1L	2022-07-26 15:57:58	-28.79	50.34	59.71	53.18
PRMLxT1L	2022-07-13 14:24:01	-28.77	53.68	50.25	47.40

Noise Measurement Field Data

Project:	Fontana Sierra Distribution Facility	Job Number:	195170026
Site No.:	ST-2	Date:	8/24/2022
Analyst:	Kiera Pascua and Steven Yu	Time:	9:31 - 9:41 AM
Location:	End of cul-de-sac on Olympic Court		
Noise Sources:	Landscaping (lawn mowers), distant traffic, birds		
Comments:			

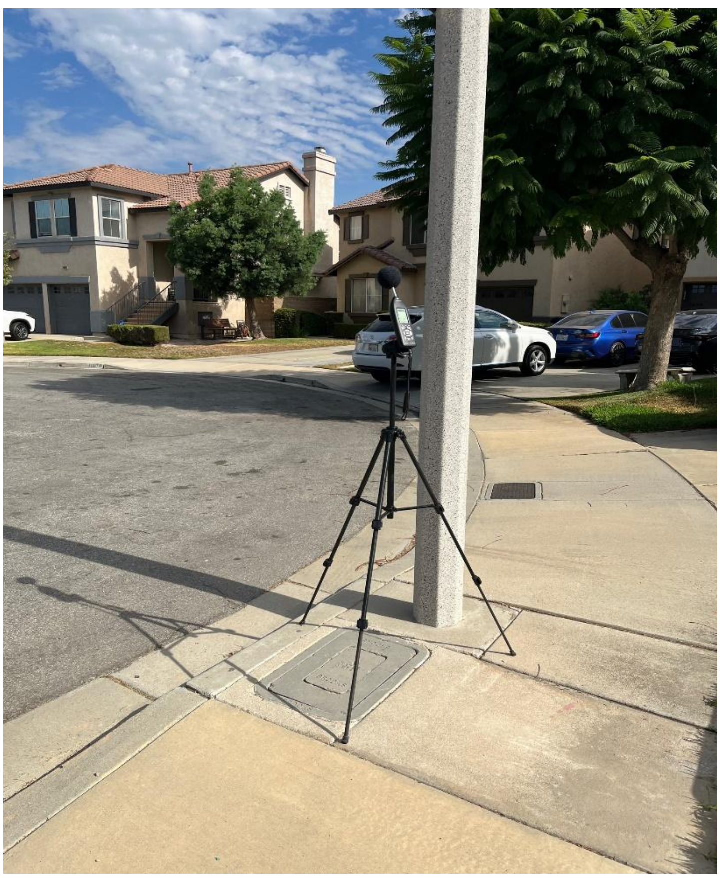
Results (dBA):

	Leq:	Lmin:	Lmax:	Peak:
Measurement 1:	50.5	45.1	58.5	78.5

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

Weather	
Temp. (degrees F):	82
Wind (mph):	< 5
Sky:	Clear
Bar. Pressure:	29.84 inHg
Humidity:	49%

Photo:



Kimley»Horn

Summary			
File Name on Meter	FONT.002.s		
File Name on PC	LxTse_0007061-20220824 093113-FONT.002.ldbin		
Serial Number	0007061		
Model	SoundExpert® LxT		
Firmware Version	2.404		
User			
Location			
Job Description			
Note			

Measurement	
Description	
Start	2022-08-24 09:31:13
Stop	2022-08-24 09:41:13
Duration	00:10:00.0
Run Time	00:10:00.0
Pause	00:00:00.0
Pre-Calibration	2022-08-23 17:05:17
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	122.6 dB		
	A	C	Z
Under Range Peak	79.2	76.2	81.2 dB
Under Range Limit	24.3	25.3	31.5 dB
Noise Floor	15.1	16.2	22.4 dB
	First	Second	Third
Instrument Identification	ıley-Horn and Associates	Town&Country Rd, #700	Orange, CA 92868

Results

LAeq	50.5 dB		
LAE	78.3 dB		
EA	7.480 µPa²h		
LApeak (max)	2022-08-24 09:36:38	78.5 dB	
LASmax	2022-08-24 09:35:08	58.5 dB	
LASmin	2022-08-24 09:31:13	45.1 dB	
SEA	-99.9 dB		

	Exceedance Counts	Duration
LAS > 85.0 dB	0	0.0 s
LAS > 115.0 dB	0	0.0 s
LApeak > 135.0 dB	0	0.0 s
LApeak > 137.0 dB	0	0.0 s
LApeak > 140.0 dB	0	0.0 s

Community Noise	Ldn	LDay 07:00-22:00	LNight 22:00-07:00	Lden	LDay 07:00-19:00	LEvening 19:00-22:00
	50.5	50.5	-99.9	50.5	50.5	-99.9

LCeq	62.9 dB
LAeq	50.5 dB
LCeq - LAeq	12.4 dB
LAIeq	51.6 dB
LAeq	50.5 dB
LAIeq - LAeq	1.1 dB

	A		C		Z	
	dB	Time Stamp	dB	Time Stamp	dB	Time Stamp
Leq	50.5		62.9			
LS(max)	58.5	2022/08/24 9:35:08				
LS(min)	45.1	2022/08/24 9:31:13				
LPeak(max)	78.5	2022/08/24 9:36:38				

Overload Count	0
Overload Duration	0.0 s
OBA Overload Count	0
OBA Overload Duration	0.0 s

Statistics

LA 5.00	53.2 dB
LA 10.00	52.1 dB
LA 33.30	50.6 dB
LA 50.00	50.0 dB
LA 66.60	49.3 dB
LA 90.00	48.2 dB

Calibration History

Preamp	Date	dB re. 1V/Pa	6.3	8.0	10.0
PRMLxT1L	2022-08-23 17:05:17	-28.86	72.23	67.38	52.44
PRMLxT1L	2022-08-17 11:26:02	-28.89	65.51	67.15	63.95
PRMLxT1L	2022-08-16 15:37:51	-28.74	42.60	61.02	61.06
PRMLxT1L	2022-08-09 16:00:21	-28.86	51.28	58.57	50.94
PRMLxT1L	2022-08-03 10:37:30	-28.67	77.56	66.31	69.99
PRMLxT1L	2022-08-02 14:52:32	-29.25	63.71	67.15	67.78
PRMLxT1L	2022-07-27 11:29:48	-28.66	66.62	59.22	92.15
PRMLxT1L	2022-07-27 11:13:44	-28.62	27.52	36.01	53.09
PRMLxT1L	2022-07-26 16:22:40	-28.86	56.89	60.40	57.01
PRMLxT1L	2022-07-26 15:57:58	-28.79	50.34	59.71	53.18
PRMLxT1L	2022-07-13 14:24:01	-28.77	53.68	50.25	47.40

Noise Measurement Field Data

Project:	Fontana Sierra Distribution Facility	Job Number:	195170026
Site No.:	ST-3	Date:	8/24/2022
Analyst:	Kiera Pascua and Steven Yu	Time:	9:50 - 10:00 AM
Location:	End of cul-de-sac on Mange Avenue		
Noise Sources:	Loud trucks, industrial construction noises, cars revving engines		
Comments:			

Results (dBA):

	Leq:	Lmin:	Lmax:	Peak:
Measurement 1:	67.0	47.6	87.5	107.2

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

Weather	
Temp. (degrees F):	83
Wind (mph):	< 5
Sky:	Clear
Bar. Pressure:	29.84 inHg
Humidity:	47%

Photo:

Kimley»Horn

Summary			
File Name on Meter	FONT.003.s		
File Name on PC	LxTse_0007061-20220824 095005-FONT.003.ldbin		
Serial Number	0007061		
Model	SoundExpert® LxT		
Firmware Version	2.404		
User			
Location			
Job Description			
Note			

Measurement	
Description	
Start	2022-08-24 09:50:05
Stop	2022-08-24 10:00:05
Duration	00:10:00.0
Run Time	00:10:00.0
Pause	00:00:00.0
Pre-Calibration	2022-08-23 17:05:17
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	122.6 dB		
	A	C	Z
Under Range Peak	79.2	76.2	81.2 dB
Under Range Limit	24.3	25.3	31.5 dB
Noise Floor	15.1	16.2	22.4 dB
	First	Second	Third
Instrument Identification	ıley-Horn and Associates	Town&Country Rd, #700	Orange, CA 92868

Results

LAeq	67.0 dB		
LAE	94.8 dB		
EA	334.125 µPa²h		
LApeak (max)	2022-08-24 09:52:54	107.2 dB	
LASmax	2022-08-24 09:52:54	87.5 dB	
LASmin	2022-08-24 09:54:40	47.6 dB	
SEA	-99.9 dB		

	Exceedance Counts	Duration
LAS > 85.0 dB	1	1.7 s
LAS > 115.0 dB	0	0.0 s
LApeak > 135.0 dB	0	0.0 s
LApeak > 137.0 dB	0	0.0 s
LApeak > 140.0 dB	0	0.0 s

Community Noise	Ldn	LDay 07:00-22:00	LNight 22:00-07:00	Lden	LDay 07:00-19:00	LEvening 19:00-22:00
	67.0	67.0	-99.9	67.0	67.0	-99.9

LCeq	74.4 dB
LAeq	67.0 dB
LCeq - LAeq	7.4 dB
LAIeq	70.2 dB
LAeq	67.0 dB
LAIeq - LAeq	3.2 dB

	A		C		Z	
	dB	Time Stamp	dB	Time Stamp	dB	Time Stamp
Leq	67.0		74.4			
LS(max)	87.5	2022/08/24 9:52:54				
LS(min)	47.6	2022/08/24 9:54:40				
LPeak(max)	107.2	2022/08/24 9:52:54				

Overload Count	0
Overload Duration	0.0 s
OBA Overload Count	0
OBA Overload Duration	0.0 s

Statistics

LA 5.00	71.4 dB
LA 10.00	66.4 dB
LA 33.30	56.5 dB
LA 50.00	55.8 dB
LA 66.60	55.6 dB
LA 90.00	52.3 dB

Calibration History

Preamp	Date	dB re. 1V/Pa	6.3	8.0	10.0
PRMLxT1L	2022-08-23 17:05:17	-28.86	72.23	67.38	52.44
PRMLxT1L	2022-08-17 11:26:02	-28.89	65.51	67.15	63.95
PRMLxT1L	2022-08-16 15:37:51	-28.74	42.60	61.02	61.06
PRMLxT1L	2022-08-09 16:00:21	-28.86	51.28	58.57	50.94
PRMLxT1L	2022-08-03 10:37:30	-28.67	77.56	66.31	69.99
PRMLxT1L	2022-08-02 14:52:32	-29.25	63.71	67.15	67.78
PRMLxT1L	2022-07-27 11:29:48	-28.66	66.62	59.22	92.15
PRMLxT1L	2022-07-27 11:13:44	-28.62	27.52	36.01	53.09
PRMLxT1L	2022-07-26 16:22:40	-28.86	56.89	60.40	57.01
PRMLxT1L	2022-07-26 15:57:58	-28.79	50.34	59.71	53.18
PRMLxT1L	2022-07-13 14:24:01	-28.77	53.68	50.25	47.40

Noise Measurement Field Data

Project:	Fontana Sierra Distribution Facility	Job Number:	195170026
Site No.:	ST-4	Date:	8/24/2022
Analyst:	Kiera Pascua and Steven Yu	Time:	10:05 - 10:15 AM
Location:	Southeast corner of project site along Mango Avenue		
Noise Sources:	Delivery trucks		
Comments:			

Results (dBA):

	Leq:	Lmin:	Lmax:	Peak:
Measurement 1:	65.3	52.6	82.7	94.6

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

Weather	
Temp. (degrees F):	84
Wind (mph):	< 5
Sky:	Clear
Bar. Pressure:	29.84
Humidity:	48%

Photo:

Kimley»Horn

Summary			
File Name on Meter	FONT.004.s		
File Name on PC	LxTse_0007061-20220824 100514-FONT.004.ldbin		
Serial Number	0007061		
Model	SoundExpert® LxT		
Firmware Version	2.404		
User			
Location			
Job Description			
Note			

Measurement	
Description	
Start	2022-08-24 10:05:14
Stop	2022-08-24 10:15:14
Duration	00:10:00.0
Run Time	00:10:00.0
Pause	00:00:00.0
Pre-Calibration	2022-08-23 17:05:17
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	122.6 dB		
	A	C	Z
Under Range Peak	79.2	76.2	81.2 dB
Under Range Limit	24.3	25.3	31.5 dB
Noise Floor	15.1	16.2	22.4 dB
	First	Second	Third
Instrument Identification	ıley-Horn and Associates	Town&Country Rd, #700	Orange, CA 92868

Results

LAeq	65.3 dB		
LAE	93.1 dB		
EA	225.896 µPa²h		
LApeak (max)	2022-08-24 10:11:45	94.6 dB	
LASmax	2022-08-24 10:11:45	82.7 dB	
LASmin	2022-08-24 10:05:14	52.6 dB	
SEA	-99.9 dB		

	Exceedance Counts	Duration
LAS > 85.0 dB	0	0.0 s
LAS > 115.0 dB	0	0.0 s
LApeak > 135.0 dB	0	0.0 s
LApeak > 137.0 dB	0	0.0 s
LApeak > 140.0 dB	0	0.0 s

Community Noise	Ldn	LDay 07:00-22:00	LNight 22:00-07:00	Lden	LDay 07:00-19:00	LEvening 19:00-22:00
	65.3	65.3	-99.9	65.3	65.3	-99.9

LCeq	76.3 dB
LAeq	65.3 dB
LCeq - LAeq	11.0 dB
LAIeq	67.6 dB
LAeq	65.3 dB
LAIeq - LAeq	2.3 dB

	A		C		Z	
	dB	Time Stamp	dB	Time Stamp	dB	Time Stamp
Leq	65.3		76.3			
LS(max)	82.7	2022/08/24 10:11:45				
LS(min)	52.6	2022/08/24 10:05:14				
LPeak(max)	94.6	2022/08/24 10:11:45				

Overload Count	0
Overload Duration	0.0 s
OBA Overload Count	0
OBA Overload Duration	0.0 s

Statistics

LA 5.00	72.4 dB
LA 10.00	67.6 dB
LA 33.30	57.8 dB
LA 50.00	56.2 dB
LA 66.60	55.2 dB
LA 90.00	54.5 dB

Calibration History

Preamp	Date	dB re. 1V/Pa	6.3	8.0	10.0
PRMLxT1L	2022-08-23 17:05:17	-28.86	72.23	67.38	52.44
PRMLxT1L	2022-08-17 11:26:02	-28.89	65.51	67.15	63.95
PRMLxT1L	2022-08-16 15:37:51	-28.74	42.60	61.02	61.06
PRMLxT1L	2022-08-09 16:00:21	-28.86	51.28	58.57	50.94
PRMLxT1L	2022-08-03 10:37:30	-28.67	77.56	66.31	69.99
PRMLxT1L	2022-08-02 14:52:32	-29.25	63.71	67.15	67.78
PRMLxT1L	2022-07-27 11:29:48	-28.66	66.62	59.22	92.15
PRMLxT1L	2022-07-27 11:13:44	-28.62	27.52	36.01	53.09
PRMLxT1L	2022-07-26 16:22:40	-28.86	56.89	60.40	57.01
PRMLxT1L	2022-07-26 15:57:58	-28.79	50.34	59.71	53.18
PRMLxT1L	2022-07-13 14:24:01	-28.77	53.68	50.25	47.40

Noise Measurement Field Data

Project:	Fontana Sierra Distribution Facility	Job Number:	195170026
Site No.:	ST-5	Date:	8/24/2022
Analyst:	Kiera Pascua and Steven Yu	Time:	10:23 - 10:33 AM
Location:	Past the entrance on Windflower Avenue, within project site		
Noise Sources:	Street traffic, loud trucks		
Comments:			

Results (dBA):

	Leq:	Lmin:	Lmax:	Peak:
Measurement 1:	65.3	50.1	81.3	94.5

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

Weather	
Temp. (degrees F):	84
Wind (mph):	5
Sky:	Clear
Bar. Pressure:	29.84 inHg
Humidity:	46%

Photo:

Kimley»Horn

Summary			
File Name on Meter	FONT.005.s		
File Name on PC	LxTse_0007061-20220824 102326-FONT.005.ldbin		
Serial Number	0007061		
Model	SoundExpert® LxT		
Firmware Version	2.404		
User			
Location			
Job Description			
Note			

Measurement	
Description	
Start	2022-08-24 10:23:26
Stop	2022-08-24 10:33:26
Duration	00:10:00.0
Run Time	00:10:00.0
Pause	00:00:00.0
Pre-Calibration	2022-08-23 17:05:17
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	122.6 dB		
	A	C	Z
Under Range Peak	79.2	76.2	81.2 dB
Under Range Limit	24.3	25.3	31.5 dB
Noise Floor	15.1	16.2	22.4 dB
	First	Second	Third
Instrument Identification	ıley-Horn and Associates	Town&Country Rd, #700	Orange, CA 92868

Results	
LAeq	65.3 dB
LAE	93.1 dB
EA	225.896 µPa²h

LApeak (max)	2022-08-24 10:29:39	94.5 dB
LASmax	2022-08-24 10:29:39	81.3 dB
LASmin	2022-08-24 10:31:24	50.1 dB
SEA	-99.9 dB	

	Exceedance Counts	Duration
LAS > 85.0 dB	0	0.0 s
LAS > 115.0 dB	0	0.0 s
LApeak > 135.0 dB	0	0.0 s
LApeak > 137.0 dB	0	0.0 s
LApeak > 140.0 dB	0	0.0 s

Community Noise	Ldn	LDay 07:00-22:00	LNight 22:00-07:00	Lden	LDay 07:00-19:00	LEvening 19:00-22:00
	65.3	65.3	-99.9	65.3	65.3	-99.9

LCeq	75.5 dB
LAeq	65.3 dB
LCeq - LAeq	10.2 dB
LAIeq	67.0 dB
LAeq	65.3 dB
LAIeq - LAeq	1.7 dB

	A		C		Z	
	dB	Time Stamp	dB	Time Stamp	dB	Time Stamp
Leq	65.3		75.5			
LS(max)	81.3	2022/08/24 10:29:39				
LS(min)	50.1	2022/08/24 10:31:24				
LPeak(max)	94.5	2022/08/24 10:29:39				

Overload Count	0
Overload Duration	0.0 s
OBA Overload Count	0
OBA Overload Duration	0.0 s

Statistics

LA 5.00	70.1 dB
LA 10.00	68.1 dB
LA 33.30	63.7 dB
LA 50.00	60.9 dB
LA 66.60	58.1 dB
LA 90.00	54.3 dB

Calibration History

Preamp	Date	dB re. 1V/Pa	6.3	8.0	10.0
PRMLxT1L	2022-08-23 17:05:17	-28.86	72.23	67.38	52.44
PRMLxT1L	2022-08-17 11:26:02	-28.89	65.51	67.15	63.95
PRMLxT1L	2022-08-16 15:37:51	-28.74	42.60	61.02	61.06
PRMLxT1L	2022-08-09 16:00:21	-28.86	51.28	58.57	50.94
PRMLxT1L	2022-08-03 10:37:30	-28.67	77.56	66.31	69.99
PRMLxT1L	2022-08-02 14:52:32	-29.25	63.71	67.15	67.78
PRMLxT1L	2022-07-27 11:29:48	-28.66	66.62	59.22	92.15
PRMLxT1L	2022-07-27 11:13:44	-28.62	27.52	36.01	53.09
PRMLxT1L	2022-07-26 16:22:40	-28.86	56.89	60.40	57.01
PRMLxT1L	2022-07-26 15:57:58	-28.79	50.34	59.71	53.18
PRMLxT1L	2022-07-13 14:24:01	-28.77	53.68	50.25	47.40

Pine Valley Dr
Sierra Ave
ST-3
ST-2
Sierra Ave
ST-5
Windflower Ave
Merion Ln
Mango Ave
innecock Ln
Sierra Ave
ST-4
ST-1
Camargo Pl
Mango Ave
Maidstone Ln
Sierra Ave

Project: Fontana Sierra Distribution Center

Construction Noise Impact on Sensitive Receptors

Parameters

Construction Hours:	Daytime hours (7 am to 7 pm)	8
	Evening hours (7 pm to 10 pm)	0
	Nighttime hours (10 pm to 7 am)	0
Leq to L10 factor		3

	Receptor (Land Use)	Distance (feet)	Shielding	Direction
1	Residential (West)	730	0	W

					RECEPTOR	1
Construction Phase	Equipment Type	No. of Equip.	Acoustical Usage Factor	Reference Noise Level at 50ft per Unit, Lmax	Noise Level at Receptor 1, Lmax	Noise Level at Receptor 1, Leq
Demolition						
	Concrete Saw	1	20%	90	66.3	59.3
	Excavator	3	40%	81	62.2	58.2
	Dozer	2	40%	82	61.4	57.4
Combined LEQ						63.2
Site Preparation						
	Dozer	3	40%	82	63.2	59.2
	Tractor	4	40%	84	66.7	62.8
Combined LEQ						64.3
Grading						
	Excavator	2	40%	81	60.4	56.4
	Grader	1	40%	85	61.7	57.7
	Dozer	1	40%	82	58.4	54.4
	Scraper	2	40%	84	63.3	59.3
	Tractor	2	40%	84	63.7	59.7
Combined LEQ						64.9
Infrastructure						
	Crane	1	16%	81	57.3	49.4
	All Other Equipment > 5 HP	3	50%	85	66.5	63.5
	Generator	1	50%	81	57.3	54.3
	Tractor	3	40%	84	65.5	61.5
	Welder/Torch	1	40%	74	50.7	46.7
Combined LEQ						66.1
Building Construction						
	Crane	1	16%	81	57.3	49.4
	All Other Equipment > 5 HP	3	50%	85	66.5	63.5
	Generator	1	50%	81	57.3	54.3
	Tractor	3	40%	84	65.5	61.5
	Welder/Torch	1	40%	74	50.7	46.7
Combined LEQ						66.1
Paving/Architectural Coating						
	Paver	2	50%	77	56.9	53.9
	All Other Equipment > 5 HP	2	50%	85	64.7	61.7
	Roller	2	20%	80	59.7	52.7
	Compressor (air)	1	40%	78	54.4	50.4
Combined LEQ						63.1
Overlapping Phases						
Building Construction + Paving + Architectural Coating						67.8
Maximum Noise Level						67.8

Source for Ref. Noise Levels: RCNM, 2005

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

Project Name: Fontana Sierra Distribution Facility
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	Sierra Ave	North of Summit Ave	1	13	11,600	55	0	5.7%	4.4%	68.4	70	220	696	2,202
2	Sierra Ave	between Summit Ave and parcel	2	12.5	19,000	55	0	5.7%	4.4%	70.6	115	363	1,147	3,627
3	Sierra Ave	between parcel and Clubhouse Dr	2	12.5	19,000	55	0	5.7%	4.4%	70.6	115	363	1,147	3,627
4	Sierra Ave	between Clubhouse Dr and Sierra Lakes Parkway	3	13	18,900	55	0	5.7%	4.4%	70.6	115	364	1,152	3,644
5	Sierra Ave	south of Sierra Lakes Pkwy	3	12.5	34,700	55	0	5.7%	4.4%	73.3	211	669	2,114	6,686
6	Summit Ave	west of Sierra Ave	2	13	6,900	55	0	5.7%	4.4%	66.2	42	132	417	1,318
7	Sierra Lakes Parkway	west of Sierra Ave	2	13.5	16,000	55	0	5.7%	4.4%	69.8	97	306	966	3,056
8	Sierra Lakes Parkway	bewteen Sierra Ave and Mango Ave	2	13	16,000	55	0	5.7%	4.4%	69.8	97	305	966	3,054

[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:	Fontana Sierra Distribution Facility
Project Number:	
Scenario:	Existing 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	Sierra Ave	North of Summit Ave	1	13	11,736	55	0	5.7%	4.4%	68.5	70	223	705	2,228
2	Sierra Ave	between Summit Ave and parcel	2	12.5	19,306	55	0	5.7%	4.4%	70.7	117	369	1,165	3,685
3	Sierra Ave	between parcel and Clubhouse Dr	2	12.5	19,306	55	0	5.7%	4.4%	70.7	117	369	1,165	3,685
4	Sierra Ave	between Clubhouse Dr and Sierra Lak	3	13	19,036	55	0	5.7%	4.4%	70.6	116	367	1,161	3,670
5	Sierra Ave	south of Sierra Lakes Pkwy	3	12.5	35,108	55	0	5.7%	4.4%	73.3	214	677	2,139	6,765
6	Summit Ave	west of Sierra Ave	2	13	6,934	55	0	5.7%	4.4%	66.2	42	132	419	1,324
7	Sierra Lakes Parkway	west of Sierra Ave	2	13.5	16,408	55	0	5.7%	4.4%	69.9	99	313	991	3,134
8	Sierra Lakes Parkway	bewteen Sierra Ave and Mango Ave	2	13	16,408	55	0	5.7%	4.4%	69.9	99	313	991	3,132

[1] Distance is from the centerline of the roadway segment to the receptor location.

"-" = contour is located within the roadway right-of-way.

Noise Source	Reference Level (dBA)	Reference Distance (feet)	Distance to Receptor (feet)	Level at Receptor (dBA)[5]	Threshold	Significant?
Mechanical Equipment[1]	52	50	130	43.7	65.0	No
Truck and Loading Docks[2]	64.4	50	290	49.1	65.0	No
Parking[3]	61	50	130	52.7	65.0	No
Backup Alarms[4]	97	3.28	130	65.0	65.0	

1. Source for reference level: Elliott H. Berger, Rick Neitzel, and Cynthia A. Kladden, *Noise Navigator Sound Level Database with Over 1700 Measurement Values* , July 6, 2010.
2. Loading dock reference noise level measurements conducted by Kimley-Horn on December 18, 2018.
3. Source for reference level: Kariel, H. G., *Noise in Rural Recreational Environments* , Canadian Acoustics 19(5), 3-10, 1991.
4. Environmental Health Perspectives, Vehicle Motion Alarms: Necessity, Noise Pollution, or Both? https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3018517/, accessed September 2022.
5. 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

Parking Lot Noise

Number of Vehicles Per Hour:	85
Hourly L_{eq} at 50 feet:	45.7

$L_{eq(h)} = SEL_{ref} + 10\log(NA/1,000) - 35.6$

Where:

$L_{eq(h)}$	=	45.7	hourly L_{eq} noise level at 50 feet
SEL_{ref}	=	92	reference noise level for stationary noise source represented in sound exposure level (SEL) at 50 feet
NA	=	85	number of automobiles per hour
35.6	=	35.6	Constant, calculated as 10 times the logarithm of the number of seconds in an hour

FTA's reference noise level is 92 dBA SEL at 50 feet from the noise source for a parking lot

Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual* , September 2018.