APPENDIX D – NOISE

Kimley»Horn

MEMORANDUM

To: Kari Cano, Project Manager

From: Ace Malisos, Air Quality and Noise Manager
Kimley-Horn and Associates, Inc.

Date: April 18, 2022

Subject: Courtplace at Fontana Project EA – Noise Analysis

1.0 PURPOSE

The purpose of this memorandum is to identify the air quality and greenhouse gas (GHG) emissions associated with construction and operations of the proposed Courtplace at Fontana Project (project), located in the City of Fontana, California. This analysis has been undertaken to analyze whether the proposed project would result in any significant environmental impacts as compared to the conclusions discussed in the certified Courtplace at Fontana Environmental Assessment (EA).

Project Location and Setting

The proposed project is in the City of Fontana (City) in the southwestern portion of San Bernardino County, California. The project site is on a (gross) 4.8-acre area composed of two parcels, located at 11196 Sierra Avenue, west of Sierra Avenue and north of Jurupa Avenue. The project site is located approximately 1.0-mile south of Interstate 10 (I-10), approximately 2.5-miles north of State Route 60 (SR-60), 6.0-miles east of Interstate 15 (I-15) and 7.5-miles west of I-215.

The project site is currently undeveloped and is a vacant stormwater detention basin scattered with natural grasses. However, the project site is disturbed completely, and no native habitat exists onsite. The site is surrounded by vacant land to the north, residential land uses to the south and west, and Sierra Avenue and commercial uses to the east.

2.0 PROPOSED PROJECT

Previous Project

The proposed project would modify the two existing parcels via a Lot Line Adjustment (LLA) to allow for a two phased affordable housing project. The project proposes multi-level residential affordable apartment buildings with associated green space, pool, community gathering areas, vehicle parking, landscaping, and security fencing on the approximately 4.8-acres of land. This affordable housing project proposes a total of 155 residential units organized in three court-style buildings. Phase I will include 90-units within one three-story building "Building A" fronting Sierra Avenue, the main access road. Phase II will include 65-units within one four-story building "Building B" to the west.

Construction for Phase I of the proposed project is anticipated to begin in the second half of 2022 and last approximately one and a half year. Construction for Phase II is anticipated to begin in the second half of 2023 and would also last approximately one and a half year. Construction of the proposed project would entail site preparation, grading, building construction, paving, and architectural coating. Site preparation and grading would occur first.

Vehicular and pedestrian site access is provided via two driveways on Sierra Avenue; Driveway 1 is an exit-only driveway including a vehicular gate, located at the northeast corner of the site. Driveway 2 is a full movement driveway located on the southeast corner of the site. The Project site includes a wrap-around access road to be designed according to the City of Fontana standards.

Phase I (Building A)

Phase I will include filling in the basin at grade and subsequently the construction of building "A". Building "A" includes a leasing/management office and community building with a pool area, as well as the various residential units. Phase I will have an approximate mix of 11 percent 1 bedroom/1 bath, 63 bedroom 2 bedroom/1 bath, and 26 percent 3 bedroom/2 bath units.

Phase II (Building B)

Phase II (Building "B") would be organized around a community courtyard and has an approximate mix of 9 percent 1 bedroom/1 bath, 65 percent 2 bedroom/1 bath and 26 percent 3 bedroom/2 bath units. All buildings would be elevator served and have a combination of covered parking at grade and open parking along the perimeter. A breakdown of the proposed project is provided below in Table 1, Project Residential Units Breakdown.

Table 1: Project Residential Units Breakdown

Phase I (Building A)								
Unit Type	**Unit Area (SF)**	**Story/Level**				**Units**	**Total Unit Area (SF)**	**Unit Mix**
		L1	**L2**	**L3**	**L4**			
A1 (1BR/1BA Unit)	624	2	4	4	-	10	6,240	11%
B1 (2BR/1BA Unit)	913	9	24	24	-	57	52,041	63%
C1 (3BR/2BA Unit)	1,110	5	9	9	-	23	25,530	26%
Phase I Total		16	37	37		**90**	**83,811**	100%
Phase II (Building B)								
Unit Type	**Unit Area (SF)**	**Story/Level**				**Units**	**Total Unit Area (SF)**	**Unit Mix**
		L1	**L2**	**L3**	**L4**			
A1 (1BR/1BA Unit)	624	0	2	2	2	6	3,744	9%
B1 (2BR/1BA Unit)	913	3	13	13	13	42	38,346	65%
C1 (3BR/2BA Unit)	1,110	2	5	5	5	17	18,870	26%
Phase II Total		5	20	20	20	**65**	**60,960**	100%
Phase I & II Grand Total		*21*	*57*	*57*	*20*	**155**	**144,771**	-
Source: Design and Architecture. March 31st, 2021. BR = bedroom, BA = bathroom, SF = square feet								

Current Project

The proposed project would consist of the same site as previously analyzed. Changes would only take place in the residential units included in Building A and Building B. These changes are outlined in Table 2: Project Residential Units Breakdown Update. Overall, the number of total units would be less then the previous project.

Table 2: Project Residential Units Breakdown Update

Phase I (Building A)								
Unit Type	**Unit Area (SF)**	**Story/Level**				**Units**	**Total Unit Area (SF)**	**Unit Mix**
		L1	**L2**	**L3**	**L4**			
A2 (1BR/1BA Unit)	600	1	3	3	-	7	4,200	9%
B2 (2BR/1BA Unit)	885	10	10	10	-	30	26,550	59%
C1 (3BR/2BA Unit)	1,085	1	2	2	-	5	5,425	12%
C2 (3BR/2BA Unit)	1,110	2	3	3		8	8,880	20%
Phase I Total		14	18	18		**50**	**45,055**	100%
Phase II (Building B)								
Unit Type	**Unit Area (SF)**	**Story/Level**				**Units**	**Total Unit Area (SF)**	**Unit Mix**
		L1	**L2**	**L3**	**L4**			
A1 (1BR/1BA Unit)	624	1	2	2	2	7	4,368	8%
B1 (2BR/1BA Unit)	913	4	8	8	8	28	25,564	49%
B2 (2BR/1BA Unit)	885	1	2	2	2	7	6,195	12%
C1 (3BR/2BA Unit)	1,110	2	4	4	4	14	15,540	30%
Phase II Total		8	16	16	16	**56**	**51,667**	100%
Phase I & II Grand Total		*22*	*34*	*34*	*16*	**106**	**96,722**	-

Source:
Design and Architecture. March 31st, 2021.
BR = bedroom, BA = bathroom, SF = square feet

3.0 PROJECT SPECIFIC ANALYSIS

3.1 Noise Analysis

Construction Emissions

Construction for the previous and current project would involve the same building footprint and nearly the same exterior building architecture. Construction for the proposed project is anticipated to have similar earthwork volumes, construction phasing and equipment use as the previous project. The project construction activities and duration of approximately 28 months is the same. As distances from sensitive receptors have not changed, construction noise impacts would be the same. The project would be required to implement relevant City of Fontana noise policies.

Operational Emissions

The proposed project would include increased traffic on adjacent roadways which would increase vehicular noise in the vicinity. Based on the Traffic Study, the previous project would generate 1,135 daily trips. Traffic volumes on project area roadways would have to approximately double for the resulting traffic noise levels to generate a 3-dBA or noticeable increase. According to the General Plan, the daily average daily traffic along Sierra Avenue (between Jurupa Avenue and Santa Ana Avenue) is 32,300 vehicles. Therefore, because the previous project would not generate sufficient traffic to result in a permanent 3-dBA increase in ambient noise levels, noise impacts associated with traffic would be less than significant. The current proposed project would be smaller with less units developed. Therefore, there would be less daily trips to the project site. Traffic noise impacts would be less for the current project then the previous project.

Conclusion

The proposed project would involve the same building footprint and nearly the same exterior building architecture as the original version of the project. Construction for the proposed project is anticipated to have similar earthwork volumes, construction phasing and equipment use as the previous project. Therefore, construction noise was assumed to be similar. The project would have fewer daily trips, therefore the noise associated with traffic would be less. The project would not result in new noise impacts.

4.0 CONCLUSION

The proposed project would involve a smaller building footprint and nearly the same exterior building architecture as the previous version of the project. Less units would be developed for the proposed project. Therefore, the current project is less intense, and the previous analyses are conservative and still valid. There would be no new or more significant impacts for air quality, GHG, or noise than those previously analyzed in Courtplace at Fontana Project EA.

Acoustical Assessment
Sierra Southridge Family Apartments
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 Southridge Family Apartments 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 proposed Project site is located at 11196 Sierra Avenue, west of Sierra Avenue, and north of Jurupa Avenue in the south-central portion of the City of Fontana, within San Bernardino County (County). The site is located approximately 1.0-mile south of Interstate 10 (I-10), approximately 2.5-miles north of State Route 60 (SR-60), 6.0-miles east of Interstate 15 (I-15) and 7.5-miles west of State Route 215 (SR-215). The Project site is depicted on the border of the Fontana U.S. Geological Survey's (USGS) 7.5-minute topographic map in the northern portion of Section 30, Township 1 South, Range 5 West. The Project site is bounded by vacant land to the north, residential to the south, single-family residential units to the west, and commercial to the east; refer to Exhibit 1: Regional Map***.***

The Project site is disturbed entirely and located on a vacant rectangular-shaped stormwater detention basin site on approximately 4.8 acres or 208,878 square feet (SF) composed of two parcels (Assessor's Parcel Numbers [APNs}: 0255-101-22 and 0255-101-23). No native habitat exists onsite. The detention basin is periodically disced with scattered natural grasses. As noted above, the site is surrounded by vacant land to the north, residential to the south and west, and commercial to the east. The soils on site are mapped as Delhi fine sand soils; refer to Exhibit 2: Project Vicinity***.***

1.2 Project Description

The proposed Project would consolidate the two existing parcels into one via a Lot Line Adjustment (LLA). The Project proposes three multi-family and multi-level residential affordable apartment complex with associated green space, pool, community gathering areas, vehicle parking, landscaping, and security fencing on the approximately 4.8-acres of land. Project construction will occur in two phases.

This affordable housing Project proposes a total of 155 residential units organized in three Court-style buildings; refer to Exhibit 3: Conceptual Site Plan. Phase I will include 90-units among the three-story buildings "A" and "B" fronting the main access road of Sierra Avenue. Phase II will be a four-story, 65-unit building "C" to the west.

Phase I (Buildings A and B)

Phase I will include filling in the basin at grade and subsequently the construction of buildings "A" and "B". Building "A" will include a mixture of residential unit types, as noted below. Building "B" includes a leasing/management office and community building with a pool area, as well as the various residential units. Phase I will have an approximate mix of 11% 1 Bedroom/1 Bath, 63% 2 Bedroom/1 Bath and 26% 3 Bedroom/2 Bath units. The maximum building height is approximately 35' feet high.

Phase II (Building C)

Phase II (Building "C") will be organized around a community courtyard and has an approximate mix of 9% 1 Bedroom/1 Bath, 65% 2 Bedroom/1 Bath and 26% 3 Bedroom/2 Bath units. The maximum building height is approximately 45' feet high.

Land Use and Zoning

The City's General Plan Update 2015 – 2035 (General Plan) Land Use Map was updated and adopted on November 13, 2018.[1] Furthermore, the City's Zoning Map was updated on September 10, 2019.[2] The proposed Project is designated under the General Plan Land Use Map as Walkable Mixed-Use Corridor and Downtown (WMXU-1) with a zoning district of Form-Based Code (FBC).

Landscaping

The landscape area would cover approximately 15 percent of the Project site, a total of 39,965 square feet. Additionally, the Project will provide 79 trees.

Site Access and Parking

Vehicular and pedestrian site access is provided via two driveways on Sierra Avenue; Driveway 1 is an exit-only driveway including a vehicular gate, located at the northeast corner of the site. Driveway 2 is a full movement driveway located on the southeast corner of the site. The Project site includes a wrap-around access road to be designed according to the City of Fontana standards. The site will include 225 parking spaces as required to accommodate residents and visitors; refer to Exhibit 3.

Project Phasing and Construction

The Project is anticipated to be developed in two overlapping phases. Should the Project be approved, Phase 1 construction is anticipated to begin December 2022 and conclude March 2024, Phase 2 construction is anticipated to begin December 2023 and conclude March 2025. Project construction would occur over a duration of approximately 28 months.

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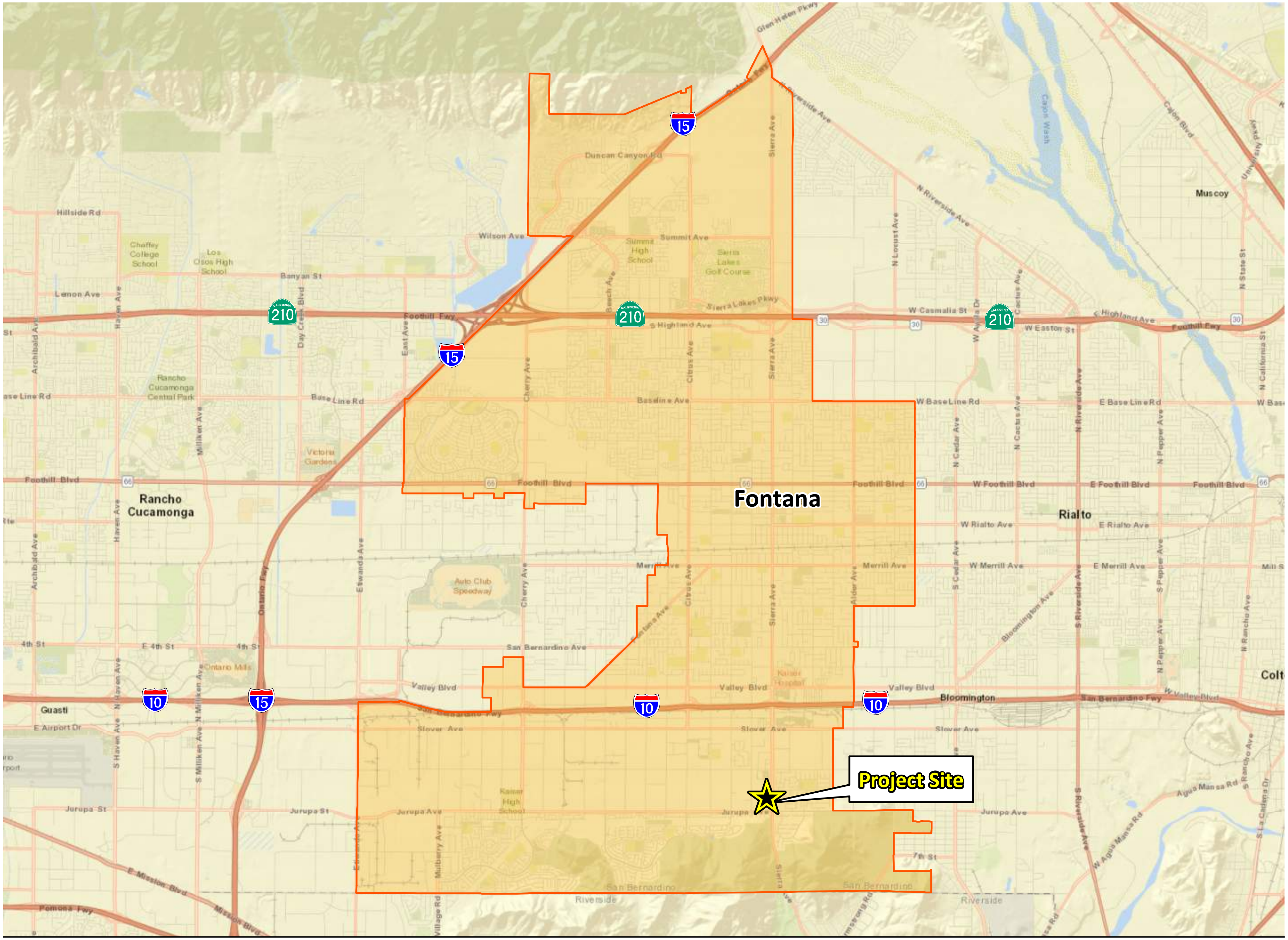
1 City of Fontana. (2018). *General Plan Land Use Map*. Available at https://www.fontana.org/DocumentCenter/View/26777/Land-Use-Map---Exhibit-158. Accessed on July 15, 2020.

2 City of Fontana. (2019). *Zoning District Map*. Available at https://www.fontana.org/DocumentCenter/View/30623/Zoning-District-Map. Accessed on July 15, 2020.



Source: ESRI World Street Map

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EXHIBIT 1: Regional Location

Sierra Southridge Family Apartments Project

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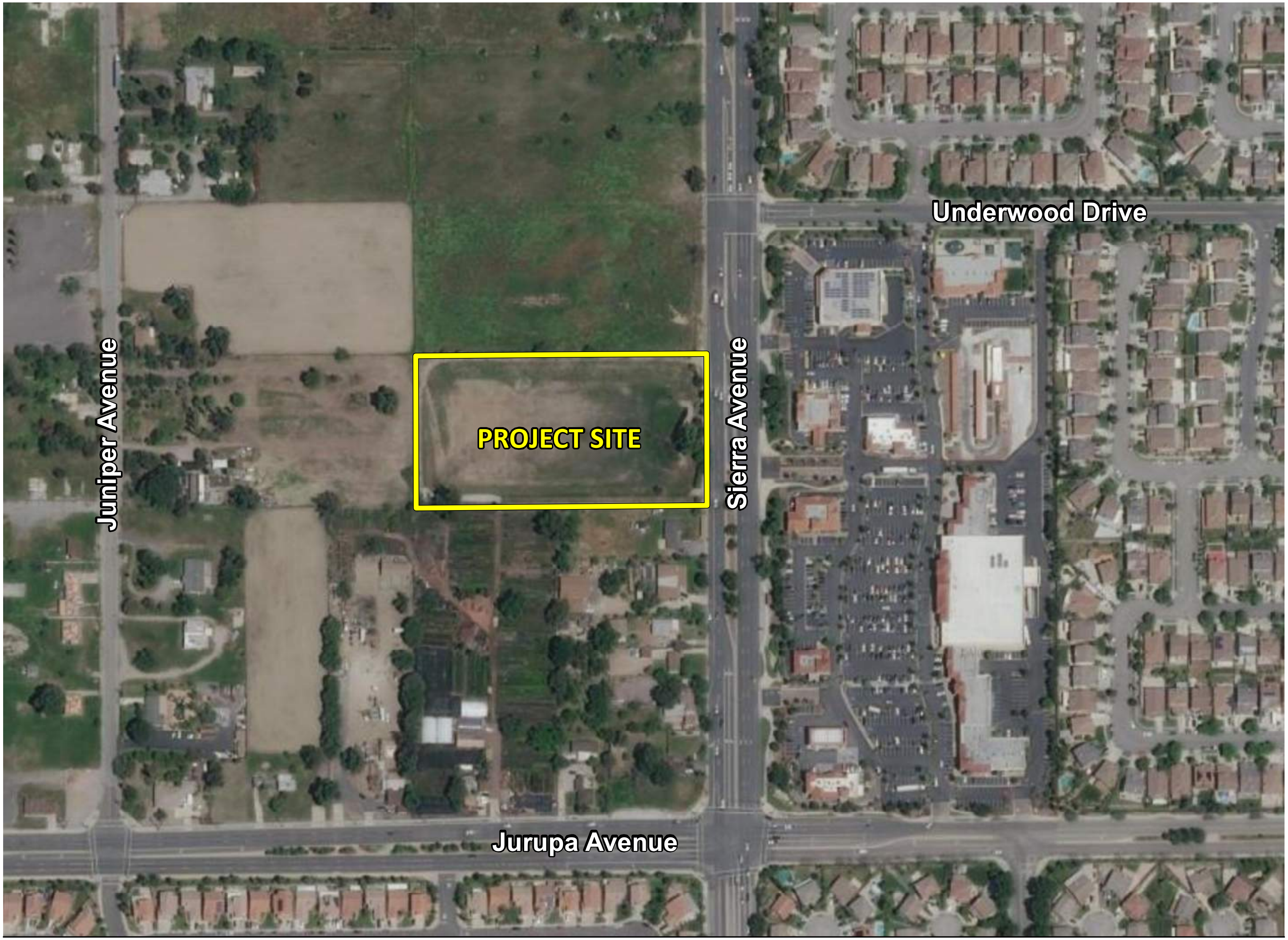

Source: ESRI World Imagery

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EXHIBIT 2: Local Vicinity
Sierra Southridge Family Apartments Project

0 175 350
Feet

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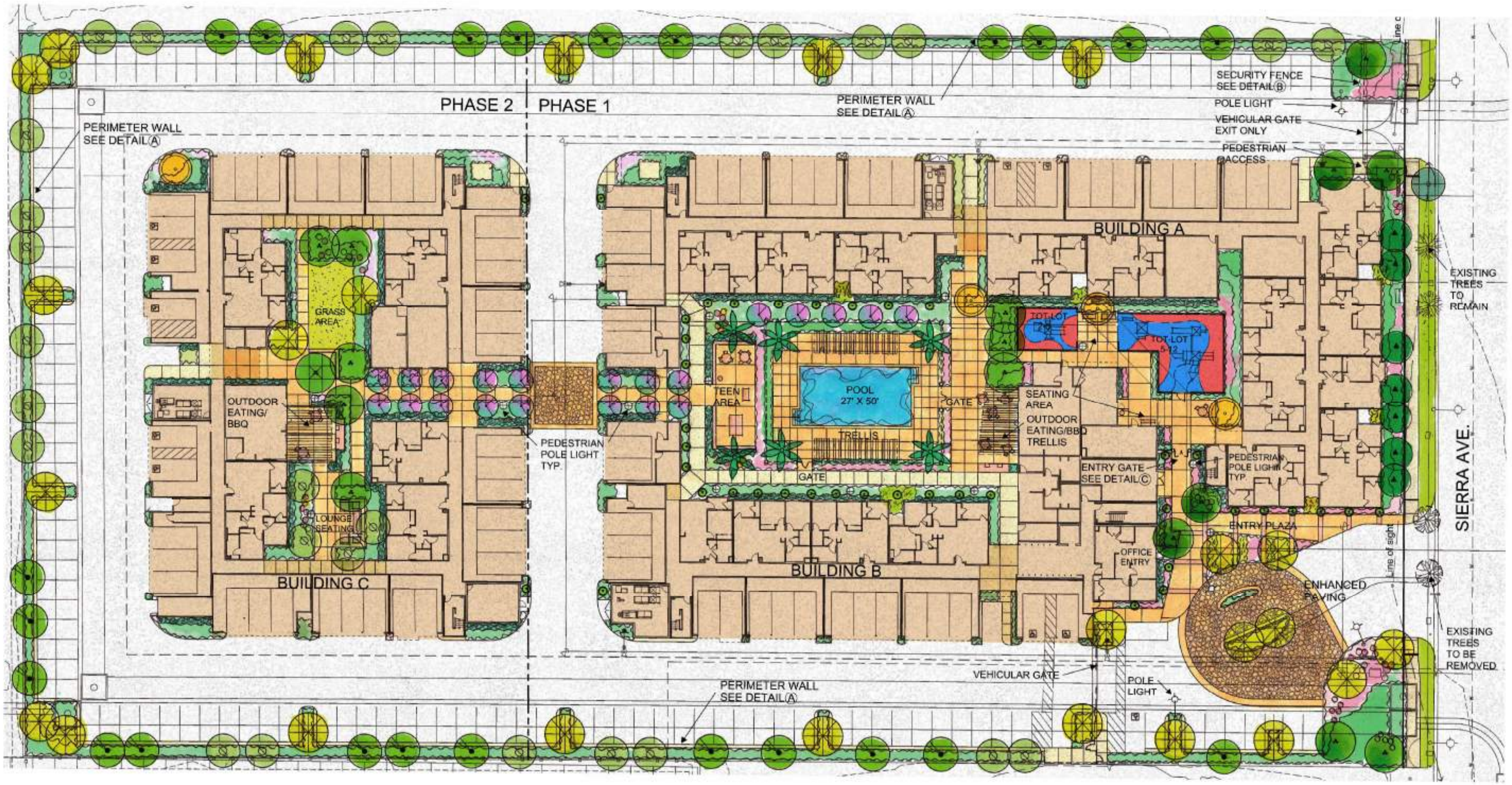

Source: Design and Architecture, Conceptual Landscape Plan 11-5-2020

EXHIBIT 3: Conceptual Site Plan

Sierra Southridge Family Apartments Project

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2 ACOUSTIC FUNDAMENTALS

2.1 Sound and Environmental Noise

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

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

Measuring sound directly in terms of pressure would require a large range of numbers. To avoid this, the decibel (dB) scale was devised. The dB scale uses the hearing threshold of 20 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 continuous sound pressure level over the measurement period, while the day-night noise level (L_{dn}) and Community Equivalent Noise Level (CNEL) are measures of energy average during a 24-hour period, with dB weighted sound levels from 7:00 p.m. to 7:00 a.m. Most commonly, environmental sounds are described in terms of L_{eq} that has the same acoustical energy as the summation of all the time-varying events. Each is applicable to this analysis and defined in Table 2: Definitions of Acoustical Terms.

Table 2: Definitions of Acoustical Terms	
Term	**Definitions**
Decibel (dB)	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in µPa (or 20 micronewtons per square meter), where 1 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.[3] 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.[4] 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.[5] 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

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

reduces noise levels by 5 to 10 dBA.[6] The way older homes in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows.

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.[7] 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[8]:

- 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

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6 James P. Cowan, *Handbook of Environmental Acoustics,* 1994.

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

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

Safety and Health Administration has a noise exposure standard that is set at the noise threshold where hearing loss may occur from long-term exposures. The maximum allowable level is 90 dBA averaged over 8 hours. If the noise is above 90 dBA, the allowable exposure time is correspondingly shorter.

Annoyance

Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The L_{dn} as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources. A noise level of about 55 dBA L_{dn} is the threshold at which a substantial percentage of people begin to report annoyance[9].

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

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

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.

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

Peak Particle Velocity (in/sec)	Approximate Vibration Velocity Level (VdB)	Human Reaction	Effect on Buildings
0.006-0.019	64-74	Range of threshold of perception	Vibrations unlikely to cause damage of any type
0.08	87	Vibrations readily perceptible	Recommended upper level to which ruins and ancient monuments should be subjected
0.1	92	Level at which continuous vibrations may begin to annoy people, particularly those involved in vibration sensitive activities	Virtually no risk of architectural damage to normal buildings
0.2	94	Vibrations may begin to annoy people in buildings	Threshold at which there is a risk of architectural damage to normal dwellings
0.4-0.6	98-104	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Architectural damage and possibly minor structural damage

Source: California Department of Transportation, *Transportation and Construction Vibration Guidance Manual*, 2013.

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 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.

3.2 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. Nosie standards 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 30-469, the performance standards for exterior noise are 65 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.

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 existing mobile noise sources in the Project area are generated by motor vehicles traveling along Sierra Avenue. Sierra Avenue is identified in the *Fontana General Plan - Community Mobility and Circulation Element* as a major highway and a truck route. Sierra Avenue currently has five travel lanes and a speed limit of 50 miles per hour. In addition, the Sierra Crossroads commercial shopping center, located east of the Project site on the opposite side Sierra Avenue, generates additional traffic.

Stationary Sources

The primary sources of stationary noise in the Project vicinity are those associated with the operations of adjacent commercial uses and high school to the north, northwest, and southeast 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

The Project site is currently vacant. To quantify existing ambient noise levels in the Project area, Kimley-Horn conducted four short-term noise measurements on March 4th, 2021; 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 11:30 a.m. and 12:33 p.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 and Exhibit 4: Noise Measurements

Table 4: Existing Noise Measurements

Site	Location	L_{eq} (dBA)	L_{min} (dBA)	L_{max} (dBA)	Time
1	Along Sierra Avenue, near southeast corner of the Project site. In front of nearest sensitive receptor	70.6	49.2	85.2	11:30 a.m.
2	Along Sierra Avenue, near northeast corner of Project Site.	71.5	53.2	85.5	12:04 p.m.
3	Intersection of Jurupa Avenue and Juniper Avenue, northeast corner.	69.1	50.9	83.5	12:23 p.m.

Source: Noise measurements taken by Kimley-Horn, March 4, 2021. See Appendix A for noise measurement results.

Source: Kimley-Horn, ESRI World Imagery

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EXHIBIT 4: Noise Measurements
Sierra Southridge Family Apartments Project

0 150 300
Feet

Kimley»Horn

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. 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 Residence	45 feet to the south
Single-Family Residences	400 feet to the west
Single-Family Residences	425 feet to the northeast
Single-Family Residences	500 feet to the northwest
Single-Family Residences	675 feet to the north
Source: Google Earth, 2021.	

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 Leq. This unit is appropriate because Leq 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

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-related activities for the Project were evaluated utilizing typical ground-borne vibration levels associated with construction equipment, obtained from FTA published data for construction equipment. Potential ground-borne vibration impacts related to building/structure damage and interference with sensitive existing operations were evaluated, considering the distance from construction activities to nearby land uses and typically applied criteria for 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 earthmovers, material handlers, and portable generators, can reach high levels. During construction, exterior noise levels could affect the residential neighborhoods surrounding the construction site. Project construction would occur adjacent to existing residential uses located approximately 45 feet to the south of the Project construction area. However, it is acknowledged that construction activities would occur throughout the Project site and would not be concentrated at a single point near sensitive receptors.

Construction activities would include site preparation, grading, building construction, paving, and architectural coating. Such activities would require 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 earthmovers, 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 for 50 feet and 45 feet; the distance to the nearest receptor.

Table 6: Typical Construction Noise Levels

Equipment	Typical Noise Level (dBA) at 50 feet from Source	Typical Noise Level (dBA) at 45 feet from Source
Air Compressor	80	81
Backhoe	80	81
Compactozr	82	83
Concrete Mixer	85	86
Concrete Pump	82	83
Concrete Vibrator	76	77
Crane, Derrick	88	89
Crane, Mobile	83	84
Dozer	85	86
Generator	82	83
Grader	85	86
Impact Wrench	85	86
Jack Hammer	88	89

Table 6: Typical Construction Noise Levels		
Equipment	**Typical Noise Level (dBA) at 50 feet from Source**	**Typical Noise Level (dBA) at 45 feet from Source**
Loader	80	81
Paver	85	86
Pile-driver (Impact)	101	102
Pile-driver (Sonic)	95	96
Pneumatic Tool	85	86
Pump	77	78
Roller	85	86
Saw	76	77
Scraper	85	86
Shovel	82	83
Truck	84	85

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 receptor (45 feet to the south) in the vicinity. Sensitive uses in the Project site vicinity include existing residential uses to the south, west, northwest, north and northeast. These sensitive receptors may be exposed to elevated noise levels during Project construction. However, construction noise would be acoustically dispersed throughout the Project site and not concentrated in one area near surrounding sensitive uses and would not exceed the threshold level. 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. Although the Municipal Code limits the hours of construction, it does not provide specific noise level performance standards for construction. However, this analysis conservatively uses the Federal Transit Administration (FTA)'s threshold of 80 dBA (8-hour Leq) for residential uses and 85 dBA (8-hour Leq) for non-residential uses to evaluate construction noise impacts.[10]

Following FTA's methodology for quantitative construction noise assessments, Federal Highway Administration's (FHWA's) Roadway Construction Noise Model (RCNM) was used to predict construction noise at the nearest sensitive receptor (i.e., residential uses to the south). Following FTA methodology, when calculating construction noise, all equipment is assumed to operate at the center of the project because equipment would operate throughout the project site and not at a fixed location for extended periods of time. Therefore, the distance used in the RCNM model was 300 feet for the nearest residential property.

The noise levels calculated in Table 7: Project Construction Noise Levels, show the exterior construction noise without accounting for attenuation from existing physical barriers which have been estimated by FHWA's Roadway Construction Noise Model (RCNM). The nearest noise sensitive receptors are the residential community adjacent to the south. Due to the overlapping phases of construction, to be

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

conservative, construction equipment from the site preparation, grading, building construction, paving, and architectural coating phases were modeled to operate simultaneously. This assumption represents a worst-case noise scenario as construction activities would routinely be spread throughout the construction site further away from noise sensitive receptors and even with overlapping construction phases, all construction activities would not occur at the same time.

Table 7: Project Construction Noise Levels

Construction Phase	Modeled Exterior Construction Noise Level at Nearest Sensitive Receptor (dBA L_{eq})		FTA Noise Threshold (dBA L_{eq})	Exceed Threshold?
Site Preparation	72.1	76.8*	80	**No**
Grading	71.7			
Construction	71.0			
Paving	65.5			
Architectural Coating	58.1			

Note: * Based on the anticipated construction schedule certain construction activities may occur on the same day, to be conservative these noise sources have been combined to show a daily maximum.
Source: Federal Highway Administration, *Roadway Construction Noise Model,* 2006. Refer to Appendix A for noise modeling results.

As shown in Table 7, exterior noise levels could reach 76.8 dBA. Construction equipment would operate throughout the Project site and the associated noise levels would not occur at a fixed location for extended periods of time. These sensitive uses may be exposed to elevated noise levels during project construction. However, construction noise would be acoustically dispersed throughout the Project site and not concentrated in one area near surrounding sensitive uses.

The City of Fontana has 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.

As indicated in Table 7, project construction noise would not exceed the FTA noise threshold for residential uses. In addition, construction activity would also by limited by Section 18-63(b)(7) of the Fontana Municipal Code which 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. By following the City's standards, the impact from construction noise would be less than significant level.

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:

- Stationary Noise Sources - mechanical equipment (i.e. trash compactors, air conditioners, etc.);
- Parking Areas Noise (i.e. car door slamming, car radios, engine start-up, and car pass-by); and
- Off-Site Traffic Noise.

Stationary Noise Sources

Project implementation would create new sources of noise in the Project vicinity. Noise that is typical of residential areas includes group conversations, pet noise, and general maintenance activities. Noise from residential stationary sources would primarily occur during the "daytime" activity hours of 7:00 a.m. to 10:00 p.m. Further, the residences would be required to comply with performance standards found in Section 30-543 of the Fontana Development Code which limits the exterior noise level to 70 dBA Leq during the daytime hours, and 65 dBA Leq during the nighttime hours at sensitive receiver locations

The Project is surrounded by residential uses to the south and west, commercial uses to the east and vacant land to the north. The nearest sensitive receptor to the Project site is a single-family residence to the south. Potential stationary noise sources related to long-term Project operations would include mechanical equipment. Mechanical equipment (e.g., heating ventilation and air conditioning [HVAC] equipment) typically generates noise levels of approximately 50 dBA at 50 feet. The HVAC units associated with the proposed buildings would be located on the roof. The nearest HVAC unit would be located approximately 200 feet from the closest sensitive receptor. At 200 feet, HVAC noise levels would be 38 dBA. As noise levels would be below the City's 70 dBA daytime standard and 65 dBA nighttime standard, noise impacts associated with HVAC equipment would be less than significant.

Parking Area Noise

The Project would provide a total of 225 parking stalls. 145 open parking stalls would be located along the north, west, and south perimeters of the Project site and 80 tuck-under parking spaces would be located around each building. Traffic associated with parking lots is typically not of sufficient volume to exceed community noise standards, which are based on a time-averaged scale such as the CNEL scale. The instantaneous maximum sound levels generated by a car door slamming, engine starting up, and car pass-bys range from 53 to 61 dBA[11] at 50 feet and may be an annoyance to adjacent noise-sensitive receptors. Conversations in parking areas may also be an annoyance to adjacent sensitive receptors. Sound levels of speech typically range from 33 dBA at 50 feet for normal speech to 50 dBA at 50 feet for very loud speech.[12] 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. Actual noise levels over time resulting from parking activities are anticipated to be far below the City's noise standards. Therefore, noise impacts associated with parking would be less than significant.

Off-Site Traffic Noise

Project implementation would generate increased traffic volumes along Sierra Avenue and Project area roadways. According to the trip generation analysis, the Project would result in 1,135 average daily vehicle trips. The Project's increase in traffic would result in noise increases on Project area roadways. In general, a 3-dBA increase in traffic noise is barely perceptible to people, while a 5-dBA increase is readily noticeable. Traffic volumes on Project area roadways would have to approximately double for the resulting traffic noise levels to generate a 3-dBA increase[13]. According to the General Plan, the daily average daily traffic along Sierra Avenue (between Jurupa Avenue and Santa Ana Avenue) is 32,300

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

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

[13] According to the California Department of Transportation, *Technical Noise Supplement to Traffic Noise Analysis Protocol* (September 2013), it takes a doubling of traffic to create a noticeable (i.e., 3 dBA) noise increase.

vehicles[14]. Therefore, because the proposed Project would not generate sufficient traffic to result in a permanent 3-dBA increase in ambient noise levels, noise impacts associated with traffic would be less than significant.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

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

Increases in ground-borne vibration levels attributable to the proposed Project would be primarily associated with short-term construction-related activities. 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.

Building damage can be cosmetic or structural. Ordinary buildings that are not particularly fragile would not experience cosmetic damage (e.g. plaster cracks) at distances beyond 30 feet. This distance can vary substantially depending on 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 vibration damage.

Human annoyance is evaluated in vibration decibels (VdB) (the vibration velocity level in decibel scale) and occurs when construction vibration rises significantly above the threshold of human perception for extended periods of time. The FTA Transit Noise and Vibration Impact Assessment Manual identifies 80 VdB as the approximate threshold for residences.

Table 8: Typical Construction Equipment Vibration Levels, lists vibration levels at 25 feet and 45 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 8, based on FTA data, vibration velocities from typical heavy construction equipment operations that would be used during Project construction range from 0.003 to 0.089 in/sec PPV at 25 feet from the source of activity, which is below the FTA's 0.20 PPV threshold. The nearest sensitive receptor is the single-family residence located approximately 45 feet to the south of the project boundary.

[14] City of Fontana, *Fontana General Plan Update 2015-2035, Chapter 9 – Community Mobility Circulation*, Exhibit 9.5 Average Daily Trips, March 2017.

Table 8: Typical Construction Equipment Vibration Levels

Equipment	Peak Particle Velocity at 25 Feet (in/sec)	Peak Particle Velocity at 45 Feet (in/sec)[1]	Approximate VdB at 25 Feet	Approximate VdB at 45 Feet[2]
Large Bulldozer	0.089	0.0369	87	79
Caisson Drilling	0.089	0.0369	87	79
Loaded Trucks	0.076	0.0315	86	78
Jackhammer	0.035	0.0145	79	71
Small Bulldozer/Tractors	0.003	0.0012	58	50

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.

As shown in Table 8, vibration velocity from construction equipment at 45 feet would not exceed 0.0369 in/sec PPV, which is below the FTA's 0.20 PPV threshold. It is also acknowledged that construction activities would occur throughout the Project site and would not be concentrated at the point closest to the nearest structure. Therefore, construction related vibration impacts resulting in building damage would be less than significant.

In addition, Table 8 shows that construction VdB levels would be 79 VdB at 45 feet (i.e., below the 80 VdB annoyance threshold). It is also acknowledged that construction activities would occur throughout the Project site and would not be concentrated at the point closest to the nearest residential structure(s). Therefore, construction related vibration impacts resulting in human annoyance would be less than significant.

Once operational, the Project would not be a significant source of ground-borne vibration. Typical sources of groundborne vibration are occasional traffic on rough roads. However, when roadways are smooth, vibration from traffic (even heavy trucks) is rarely perceptible. In addition, the rubber tires and suspension systems of on-road vehicles make it unusual for on-road vehicles to cause groundborne noise or vibration problems. It is therefore assumed that no such vehicular vibration impacts would occur and vibration impacts would be less than significant.

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 8.0 miles to the west. 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 attenuates 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

Cumulative noise impacts describe how much noise levels are projected to increase over existing conditions with the development of the proposed Project and other foreseeable projects. Cumulative noise impacts would occur primarily as a result of increased traffic on local roadways due to buildout of the proposed Project and other projects in the vicinity. According to the General Plan EIR, the daily average daily traffic along Sierra Avenue (between Jurupa Avenue and Santa Ana Avenue) is 32,300 vehicles, the addition of 1,135 additional trips associated with the Project would only increase traffic by approximately three percent, therefore Project traffic combined with cumulative traffic from future growth would not result in a cumulative impact.

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

1. California Department of Transportation, *California Vehicle Noise Emission Levels*, 1987.
2. California Department of Transportation, *Traffic Noise Analysis Protocol*, 2011.
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. City of Fontana, *General Plan*, 2018.
7. City of Fontana, *Municipal Code*, 2018.
8. Design and Architecture, *Development Package*, November 6, 2020
9. Federal Highway Administration, *Roadway Construction Noise Model*, 2006.
10. Federal Highway Administration, *Roadway Construction Noise Model User's Guide Final Report*, 2006.
11. Federal Interagency Committee on Noise, *Federal Agency Review of Selected Airport Noise Analysis Issues*, 1992.
12. Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, 2018.
13. TJW Engineering, Inc., *Fontana Southridge Focused Traffic Analysis*, December 2020
14. United States Environmental Protection Agency, *Protective Noise Levels (EPA 550/9-79-100)*, 1979.

Appendix A

NOISE DATA

Measurement Report

Report Summary

Meter's File Name	Font.001	Computer's File Name	SLM_0005586_Font_001.00.ldbin
Meter	LxT SE		
Firmware	2.402		
User		Location	
Description			
Note			

Start Time	2021-03-04 11:30:53	Duration	0:10:00.0		
End Time	2021-03-04 11:40:53	Run Time	0:10:00.0	Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	70.6 dB		
LAE	98.4 dB	SEA	--- dB
EA	772.2 µPa²h		
LA_{peak}	99.3 dB	2021-03-04 11:40:41	
LAS_{max}	85.2 dB	2021-03-04 11:40:41	
LAS_{min}	49.2 dB	2021-03-04 11:33:36	
LA_{eq}	70.6 dB		
LC_{eq}	78.0 dB	LC_{eq} - LA_{eq}	7.3 dB
LAI_{eq}	72.7 dB	LAI_{eq} - LA_{eq}	2.0 dB

Exceedances	Count	Duration
LAS > 85.0 dB	1	0:00:01.1
LAS > 115.0 dB	0	0:00:00.0
LApeak > 135.0 dB	0	0:00:00.0
LApeak > 137.0 dB	0	0:00:00.0
LApeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight	
	70.6 dB	70.6 dB	0.0 dB	
	LDEN	LDay	LEve	LNight
	70.6 dB	70.6 dB	--- dB	--- dB

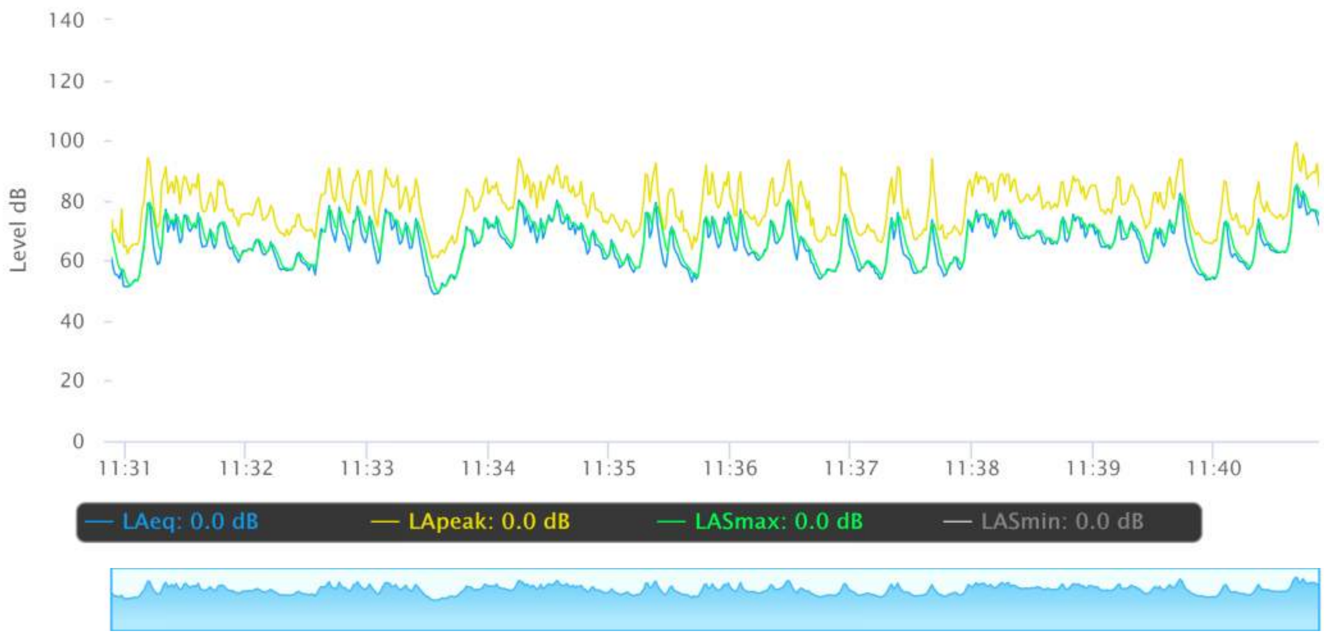
Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	70.6 dB		78.0 dB		--- dB	
$Ls_{(max)}$	85.2 dB	2021-03-04 11:40:41	--- dB		--- dB	
$LS_{(min)}$	49.2 dB	2021-03-04 11:33:36	--- dB		--- dB	
$L_{Peak(max)}$	99.3 dB	2021-03-04 11:40:41	--- dB		--- dB	

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

Statistics

LAS 5.0	76.0 dB
LAS 10.0	74.3 dB
LAS 33.3	70.0 dB
LAS 50.0	66.9 dB
LAS 66.6	63.3 dB
LAS 90.0	56.7 dB

Time History



Measurement Report

Report Summary

Meter's File Name	Font.002	Computer's File Name	SLM_0005586_Font_002.00.ldbin
Meter	LxT SE		
Firmware	2.402		
User		Location	
Description			
Note			

Start Time	2021-03-04 12:04:46	Duration	0:10:00.0		
End Time	2021-03-04 12:14:46	Run Time	0:10:00.0	Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	71.5 dB		
LAE	99.3 dB	SEA	--- dB
EA	940.4 µPa²h		
LA_{peak}	102.9 dB	2021-03-04 12:13:29	
LAS_{max}	85.5 dB	2021-03-04 12:13:29	
LAS_{min}	53.2 dB	2021-03-04 12:11:54	
LA_{eq}	71.5 dB		
LC_{eq}	77.6 dB	LC_{eq} - LA_{eq}	6.1 dB
LAI_{eq}	74.1 dB	LAI_{eq} - LA_{eq}	2.6 dB

Exceedances	Count	Duration
LAS > 85.0 dB	1	0:00:01.2
LAS > 115.0 dB	0	0:00:00.0
LApeak > 135.0 dB	0	0:00:00.0
LApeak > 137.0 dB	0	0:00:00.0
LApeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight	
	71.5 dB	71.5 dB	0.0 dB	
	LDEN	LDay	LEve	LNight
	71.5 dB	71.5 dB	--- dB	--- dB

Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	71.5 dB		77.6 dB		--- dB	
$Ls_{(max)}$	85.5 dB	2021-03-04 12:13:29	--- dB		--- dB	
$LS_{(min)}$	53.2 dB	2021-03-04 12:11:54	--- dB		--- dB	
$L_{Peak(max)}$	102.9 dB	2021-03-04 12:13:29	--- dB		--- dB	

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

Statistics

LAS 5.0	76.4 dB
LAS 10.0	75.0 dB
LAS 33.3	70.8 dB
LAS 50.0	66.7 dB
LAS 66.6	64.5 dB
LAS 90.0	60.3 dB

Time History

Measurement Report

Report Summary

Meter's File Name	Font.003	Computer's File Name	SLM_0005586_Font_003.00.ldbin
Meter	LxT SE		
Firmware	2.402		
User		Location	
Description			
Note			

Start Time	2021-03-04 12:23:07	Duration	0:10:00.0		
End Time	2021-03-04 12:33:07	Run Time	0:10:00.0	Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	69.1 dB		
LAE	96.9 dB	SEA	--- dB
EA	547.9 µPa²h		
LA_{peak}	100.1 dB	2021-03-04 12:25:43	
LAS_{max}	83.5 dB	2021-03-04 12:25:44	
LAS_{min}	50.9 dB	2021-03-04 12:27:24	
LA_{eq}	69.1 dB		
LC_{eq}	78.2 dB	LC_{eq} - LA_{eq}	9.1 dB
LAI_{eq}	71.0 dB	LAI_{eq} - LA_{eq}	1.9 dB

Exceedances

Exceedances	Count	Duration
LAS > 85.0 dB	0	0:00:00.0
LAS > 115.0 dB	0	0:00:00.0
LApeak > 135.0 dB	0	0:00:00.0
LApeak > 137.0 dB	0	0:00:00.0
LApeak > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight	
69.1 dB	69.1 dB	0.0 dB	
LDEN	**LDay**	**LEve**	**LNight**
69.1 dB	69.1 dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	69.1 dB		78.2 dB		--- dB	
$Ls_{(max)}$	83.5 dB	2021-03-04 12:25:44	--- dB		--- dB	
$LS_{(min)}$	50.9 dB	2021-03-04 12:27:24	--- dB		--- dB	
$L_{Peak(max)}$	100.1 dB	2021-03-04 12:25:43	--- dB		--- dB	

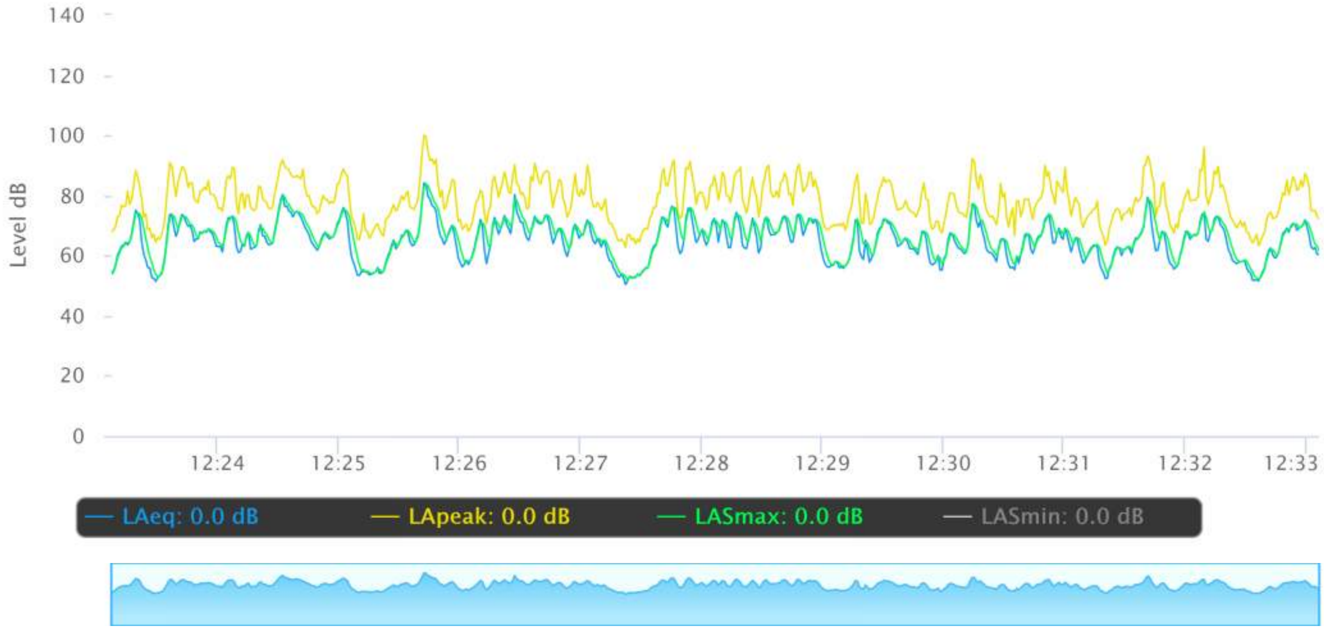
Overloads

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

Statistics

LAS 5.0	74.2 dB
LAS 10.0	72.4 dB
LAS 33.3	68.2 dB
LAS 50.0	66.0 dB
LAS 66.6	63.3 dB
LAS 90.0	56.6 dB

Time History



Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/1/2021
Case Description: 01 Site Perp Fontana Southridge

---- Receptor #1 ----

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

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	300	0
Dozer	No	40		81.7	300	0
Dozer	No	40		81.7	300	0
Tractor	No	40	84		300	0
Tractor	No	40	84		300	0
Tractor	No	40	84		300	0
Tractor	No	40	84		300	0

Results

		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Dozer		66.1	62.1	N/A	N/A	N/A	N/A
Dozer		66.1	62.1	N/A	N/A	N/A	N/A
Dozer		66.1	62.1	N/A	N/A	N/A	N/A
Tractor		68.4	64.5	N/A	N/A	N/A	N/A
Tractor		68.4	64.5	N/A	N/A	N/A	N/A
Tractor		68.4	64.5	N/A	N/A	N/A	N/A
Tractor		68.4	64.5	N/A	N/A	N/A	N/A
	Total	68.4	72.1	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/1/2021
Case Description: 02 Grading Fontana Southridge

---- Receptor #1 ----

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

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	300	0
Dozer	No	40		81.7	300	0
Grader	No	40	85		300	0
Tractor	No	40	84		300	0
Tractor	No	40	84		300	0
Tractor	No	40	84		300	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq
Excavator		65.1	61.2	N/A	N/A	N/A	N/A
Dozer		66.1	62.1	N/A	N/A	N/A	N/A
Grader		69.4	65.5	N/A	N/A	N/A	N/A
Tractor		68.4	64.5	N/A	N/A	N/A	N/A
Tractor		68.4	64.5	N/A	N/A	N/A	N/A
Tractor		68.4	64.5	N/A	N/A	N/A	N/A
	Total	69.4	71.7	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/1/2021

Case Description: 03 Construction Fontana Southridge

---- Receptor #1 ----

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

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	300	0
Backhoe	No	40		77.6	300	0
Backhoe	No	40		77.6	300	0
Backhoe	No	40		77.6	300	0
Tractor	No	40	84		300	0
Tractor	No	40	84		300	0
Tractor	No	40	84		300	0
Generator	No	50		80.6	300	0
Welder / Torch	No	40		74	300	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq
Crane		65	57	N/A	N/A	N/A	N/A
Backhoe		62	58	N/A	N/A	N/A	N/A
Backhoe		62	58	N/A	N/A	N/A	N/A
Backhoe		62	58	N/A	N/A	N/A	N/A
Tractor		68.4	64.5	N/A	N/A	N/A	N/A
Tractor		68.4	64.5	N/A	N/A	N/A	N/A
Tractor		68.4	64.5	N/A	N/A	N/A	N/A
Generator		65.1	62.1	N/A	N/A	N/A	N/A
Welder / Torch		58.4	54.5	N/A	N/A	N/A	N/A
	Total	68.4	71	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/1/2021
Case Description: 04 Paving Fontana Southridge

---- Receptor #1 ----

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

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Mixer Truck	No	40		78.8	300	0
Concrete Mixer Truck	No	40		78.8	300	0
Paver	No	50		77.2	300	0
Roller	No	20		80	300	0
Roller	No	20		80	300	0

Results

		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Mixer Truck		63.2	59.3	N/A	N/A	N/A	N/A
Concrete Mixer Truck		63.2	59.3	N/A	N/A	N/A	N/A
Paver		61.7	58.6	N/A	N/A	N/A	N/A
Roller		64.4	57.4	N/A	N/A	N/A	N/A
Roller		64.4	57.4	N/A	N/A	N/A	N/A
	Total	64.4	65.5	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/1/2021
Case Description: 05 Architectural Coating Fontana Southridge

---- Receptor #1 ----

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

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Compressor (air)	No	40		77.7	300	0

Results

		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)		62.1	58.1	N/A	N/A	N/A	N/A
	Total	62.1	58.1	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 3/15/2021
Case Description: All Construction Phases Fontana Southridge

---- Receptor #1 ----

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

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	300	0
Backhoe	No	40		77.6	300	0
Backhoe	No	40		77.6	300	0
Backhoe	No	40		77.6	300	0
Tractor	No	40	84		300	0
Tractor	No	40	84		300	0
Tractor	No	40	84		300	0
Generator	No	50		80.6	300	0
Welder / Torch	No	40		74	300	0
Concrete Mixer Truck	No	40		78.8	300	0
Concrete Mixer Truck	No	40		78.8	300	0
Paver	No	50		77.2	300	0
Roller	No	20		80	300	0
Roller	No	20		80	300	0
Compressor (air)	No	40		77.7	300	0
Dozer	No	40		81.7	300	0
Dozer	No	40		81.7	300	0
Dozer	No	40		81.7	300	0
Tractor	No	40	84		300	0
Tractor	No	40	84		300	0
Tractor	No	40	84		300	0
Excavator	No	40		80.7	300	0
Generator	No	50		80.6	300	0

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq
Crane		65	57	N/A	N/A	N/A	N/A
Backhoe		62	58	N/A	N/A	N/A	N/A
Backhoe		62	58	N/A	N/A	N/A	N/A
Backhoe		62	58	N/A	N/A	N/A	N/A
Tractor		68.4	64.5	N/A	N/A	N/A	N/A
Tractor		68.4	64.5	N/A	N/A	N/A	N/A
Tractor		68.4	64.5	N/A	N/A	N/A	N/A
Generator		65.1	62.1	N/A	N/A	N/A	N/A
Welder / Torch		58.4	54.5	N/A	N/A	N/A	N/A
Concrete Mixer Truck		63.2	59.3	N/A	N/A	N/A	N/A
Concrete Mixer Truck		63.2	59.3	N/A	N/A	N/A	N/A
Paver		61.7	58.6	N/A	N/A	N/A	N/A
Roller		64.4	57.4	N/A	N/A	N/A	N/A
Roller		64.4	57.4	N/A	N/A	N/A	N/A
Compressor (air)		62.1	58.1	N/A	N/A	N/A	N/A
Dozer		66.1	62.1	N/A	N/A	N/A	N/A
Dozer		66.1	62.1	N/A	N/A	N/A	N/A
Dozer		66.1	62.1	N/A	N/A	N/A	N/A
Tractor		68.4	64.5	N/A	N/A	N/A	N/A
Tractor		68.4	64.5	N/A	N/A	N/A	N/A
Tractor		68.4	64.5	N/A	N/A	N/A	N/A
Excavator		65.1	61.2	N/A	N/A	N/A	N/A
Dozer		66.1	62.1	N/A	N/A	N/A	N/A
Grader		69.4	65.5	N/A	N/A	N/A	N/A
Tractor		68.4	64.5	N/A	N/A	N/A	N/A
Tractor		68.4	64.5	N/A	N/A	N/A	N/A
Tractor		68.4	64.5	N/A	N/A	N/A	N/A
Generator		65.1	62.1	N/A	N/A	N/A	N/A
	Total	69.4	76.8	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.