Noise Impact Assessment

Renaissance Ranch Project

Riverside County, California

Prepared For:

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CONTENTS

LIST OF TABLES

LIST OF FIGURES

ATTACHMENTS

LIST OF ACRONYMS AND ABBREVIATIONS

CNEL	Community Noise Equivalent Level
County	Riverside County
dB	Decibel
dBA	Decibel is A-weighted
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
I-15	Interstate 15
Leq	Measure of ambient noise
OPR	Office of Planning and Research
OSHA	Federal Occupational Safety and Health Administration
PPV	Peak particle velocity
Project	Renaissance Ranch Commerce Center Project
RMS	Root mean square
WEAL	Western Electro-Acoustic Laboratory, Inc.

1.0 INTRODUCTION

This report documents the results of a Noise Impact Assessment completed for the Renaissance Ranch Commerce Center Specific Plan Project (Project), which includes the development of a 157.1-acre site in the western portion of unincorporated Riverside County (County), California. This assessment was prepared as a comparison of predicted Project noise levels to noise standards promulgated by the County of Riverside General Plan Noise Element and Municipal Code. The purpose of this report is to estimate Project-generated noise levels and to determine the level of impact the Project would have on the environment.

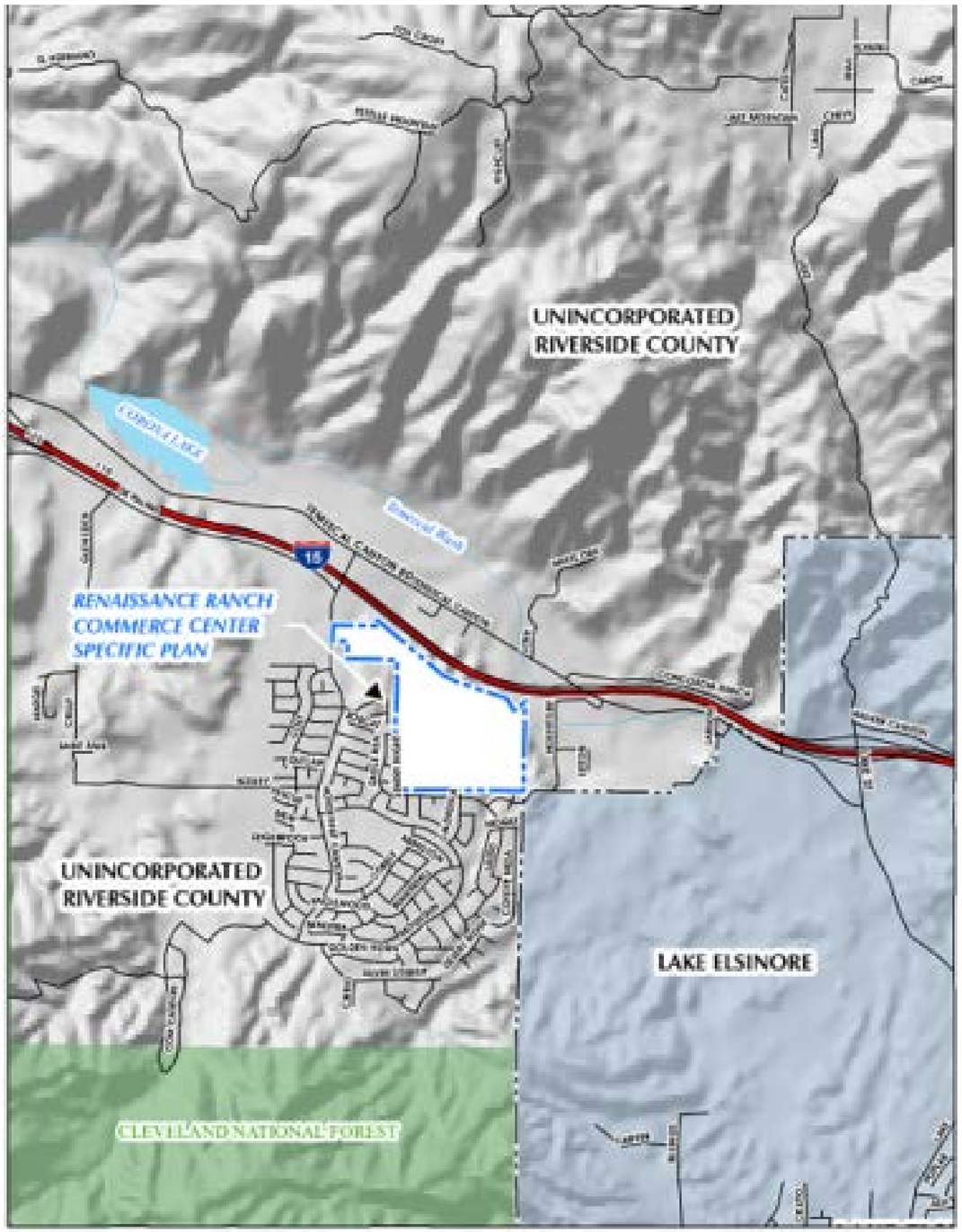
1.1 Project Location and Description

The Project site is located in the western portion of unincorporated Riverside County, more specifically near the community of Lake Elsinore and adjacent to the Horsethief Canyon Ranch community. The Project site is a 157.1-acre property located east of Horsethief Canyon Road, south of Interstate 15 (I-15), north of Palomino Creek Drive, and north and west of Hostettler Road (see Figure 1. *Project Location*). Under existing conditions, the Project site is vacant and undeveloped but has been disturbed in the past by agricultural activities. The site is generally bound by medium-density residential uses and Luiseño Elementary School to the south; medium-density residential uses, Horsethief Canyon Park and the Horsethief Canyon Wastewater Treatment Plant to the west; rural residences, a small area of open space and I-15 to the north; and open space and an existing construction storage yard to the east.

The Project is proposing an amendment to the Renaissance Ranch Specific Plan, a General Plan Amendment and Change of Zone from Medium Density Residential to a combination of Busines Park, Light Industrial, OpenSpace-Conservation, Open Space- Conservation. Additionally, the Project is proposing offsite water improvements that would occur on Horsethief Canyon Road, between the northwest corner of the Project site and the existing point of connection located north of I-15. Table 1 provides a statistical summary for the various land uses proposed by the Project.

Table 1. Land Use Plan Statistical Summary				
Planning Area	**Land Use Designation**	**Acres**	**Maximum Building Square Footage (Square Foot (sf))**	**Anticipated Use Types and Building Area (SF)[1]**
1	Business Park (BP)	18.0	392,040	Warehousing: 156,816 Industrial Park: 235,224
2	Light Industrial (LI)	97.2	2,117,016	High-Cube Cold Storage: 423,403 High-Cube Fulfillment: 740,956 High-Cube Warehouse: 740,956 Manufacturing: 211,702
Development Subtotals:		**115.2**	**2,509,056**	**2,509,056**
3	Open Space – Conservation (OS-C)	6.1	--	Open Space
4	Open Space – Conservation (OS-C)	5.4	--	Open Space
Open Space – Conservation Subtotal:		**11.5**	**--**	**--**
5	Open Space – Conservation Habitat (OS-CH)	1.8	--	Open Space Habitat
6	Open Space – Conservation Habitat (OS-CH)	25.3	--	Open Space Habitat
Open Space – Conservation Habitat Subtotal:		**27.1**	**--**	**--**
--	Circulation	3.3	--	Major Circulation
Project Total:		**157.1**	**2,509,056**	**2,509,056**

Notes: [1]Totals reflect rounding



Map Date: *2/24/2021*
Photo (or Base) Source: *Specific Plan 333*

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Figure 1. Project Location

2020-103

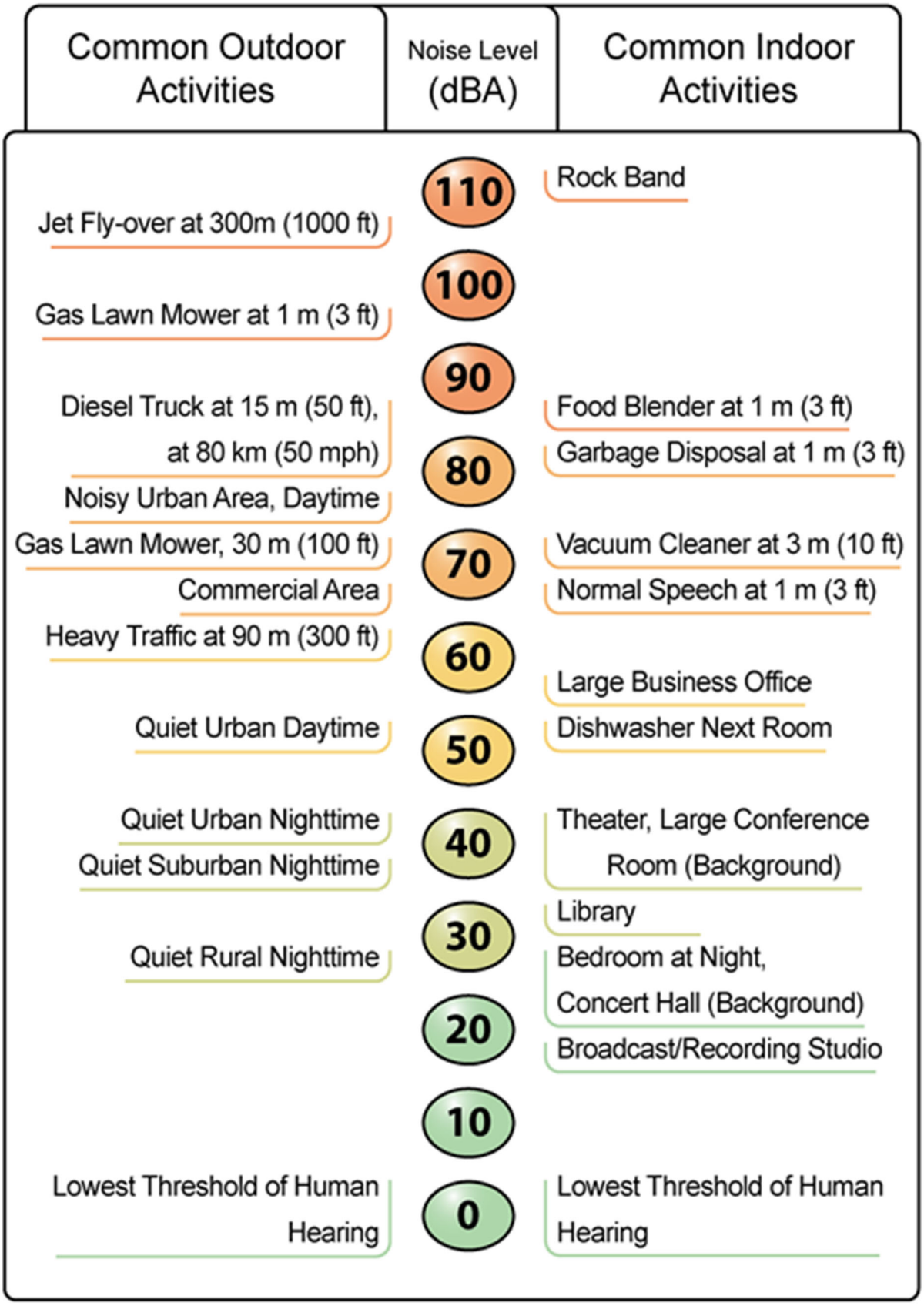
2.0 ENVIRONMENTAL NOISE AND GROUNDBORNE VIBRATION ANALYSIS

2.1 Fundamentals of Noise and Environmental Sound

2.1.1 Addition of Decibels

The decibel (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 decibel is A-weighted (dBA), an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70-dBA sound is half as loud as an 80-dBA sound and twice as loud as a 60-dBA sound. When two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be three dB higher than one source under the same conditions (Federal Transit Administration [FTA] 2018). For example, a 65-dB source of sound, such as a truck, when joined by another 65 dB source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by three dB). Under the decibel scale, three sources of equal loudness together would produce an increase of five dB.

Typical noise levels associated with common noise sources are depicted in Figure 2. *Common Noise Levels*



Source: California Department of Transportation (Caltrans) 2020a

Figure 2. Common Noise Levels

2.1.2 Sound Propagation and Attenuation

Noise can be generated by a number of sources, including mobile sources such as automobiles, trucks and airplanes, and stationary sources such as construction sites, machinery, and industrial operations. Sound spreads (propagates) uniformly outward in a spherical pattern, and the sound level decreases (attenuates) at a rate of approximately six 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, often referred to as cylindrical spreading. Sound levels attenuate at a rate of approximately three dB for each doubling of distance from a line source, such as a roadway, depending on ground surface characteristics (Federal Highway Administration [FHWA] 2011). No excess attenuation is assumed for hard surfaces like a parking lot or a body of water. Soft surfaces, such as soft dirt or grass, can absorb sound, so an excess ground-attenuation value of 1.5 dB per doubling of distance is normally assumed. For line sources, an overall attenuation rate of three dB per doubling of distance is assumed (FHWA 2011).

Noise levels may also be reduced by intervening structures; generally, a single row of detached buildings between the receptor and the noise source reduces the noise level by about five dBA (FHWA 2006), while a solid wall or berm generally reduces noise levels by 10 to 20 dBA (FHWA 2011). However, noise barriers or enclosures specifically designed to reduce site-specific construction noise can provide a sound reduction 35 dBA or greater (Western Electro-Acoustic Laboratory, Inc. [WEAL] 2000). To achieve the most potent noise-reducing effect, a noise enclosure/barrier must physically fit in the available space, must completely break the “line of sight” between the noise source and the receptors, must be free of degrading holes or gaps, and must not be flanked by nearby reflective surfaces. Noise barriers must be sizable enough to cover the entire noise source and extend lengthwise and vertically as far as feasibly possible to be most effective. The limiting factor for a noise barrier is not the component of noise transmitted through the material, but rather the amount of noise flanking around and over the barrier. In general, barriers contribute to decreasing noise levels only when the structure breaks the "line of sight" between the source and the receiver.

The manner in which 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 (Caltrans 2002). The exterior-to-interior reduction of newer residential units is generally 30 dBA or more (Harris Miller, Miller & Hanson Inc. [HMMH] 2006). Generally, in exterior noise environments ranging from 60 dBA Community Noise Equivalent Level (CNEL) to 65 dBA CNEL, interior noise levels can typically be maintained below 45 dBA, a typically residential interior noise standard, with the incorporation of an adequate forced air mechanical ventilation system in each residential building, and standard thermal-pane residential windows/doors with a minimum rating of Sound Transmission Class (STC) 28. (STC is an integer rating of how well a building partition attenuates airborne sound. In the U.S., it is widely used to rate interior partitions, ceilings, floors, doors, windows, and exterior wall configurations.) In exterior noise environments of 65 dBA CNEL or greater, a combination of forced-air mechanical ventilation and sound-rated construction methods is often required to meet the interior noise level limit. Attaining the necessary noise reduction from exterior to interior spaces is readily achievable in noise environments less than 75 dBA CNEL with proper wall construction techniques following California Building Code methods, the selections of proper windows and doors, and the incorporation of forced-air mechanical ventilation systems.

2.1.3 Noise Descriptors

The decibel 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 L_{eq} is a measure of ambient noise, while the L_{dn} and CNEL (Community Noise Equivalent Level) are measures of community noise. Each is applicable to this analysis and defined in Table 2.

Table 2. Common Acoustical Descriptors

Descriptor	Definition
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 micropascals (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 decibels 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 micropascals). 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 decibels 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 Leq 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.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn} or DNL	A 24-hour average Leq 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 in the nighttime. The logarithmic effect of these additions is that a 60 dBA 24-hour Leq would result in a measurement of 66.4 dBA Ldn.
Community Noise Equivalent Level, CNEL	A 24-hour average Leq with a 5 dBA "weighting" during the hours of 7:00 p.m. to 10:00 p.m. and a 10 dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively. The logarithmic effect of these additions is that a 60 dBA 24-hour Leq 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.
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.

The A weighted decibel 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 ±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. Close to the noise source, the models are accurate to within about ±1 to 2 dBA.

2.1.4 Human Response to Noise

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

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

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived by humans.
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference.
- A change in level of at least 5 dBA is required before any noticeable change in community response would be expected. An increase of 5 dBA 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.

2.1.5 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 (OSHA) 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 eight 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. For ground vehicles, a noise level of about 55 dBA L_{dn} is the threshold at which a substantial percentage of people begin to report annoyance.

2.2 Fundamentals of Environmental Groundborne Vibration

2.2.1 Vibration Sources and Characteristics

Sources of earthborne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or manmade causes (explosions, machinery, traffic, trains, construction equipment, etc.). Vibration sources may be continuous (e.g., factory machinery) or transient (e.g., explosions).

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One is the peak particle velocity (PPV); another is the root mean square (RMS) velocity. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. The RMS velocity is defined as the average of the squared amplitude of the signal. The PPV and RMS vibration velocity amplitudes are used to evaluate human response to vibration.

PPV is generally accepted as the most appropriate descriptor for evaluating the potential for building damage. For human response, however, an average vibration amplitude is more appropriate because it takes time for the human body to respond to the excitation (the human body responds to an average vibration amplitude, not a peak amplitude). Because the average particle velocity over time is zero, the RMS amplitude is typically used to assess human response. The RMS value is the average of the amplitude squared over time, typically a 1- sec. period (FTA 2018).

Table 3 displays the reactions of people and the effects on buildings produced by continuous vibration levels. The annoyance levels shown in the table should be interpreted with care since vibration may be found to be annoying at much lower levels than those listed, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. In high-noise environments,

which are more prevalent where groundborne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

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. For instance, heavy-duty trucks generally generate groundborne vibration velocity levels of 0.006 PPV at 50 feet under typical circumstances, which as identified in Table 3 is considered very unlikely to cause damage to buildings of any type. Common sources for groundborne vibration are planes, trains, and construction activities such as earth-moving which requires the use of heavy-duty earth moving equipment.

Table 3. Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibration Levels

Peak Particle Velocity (inches/second)	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: Caltrans 2020b

3.0 EXISTING ENVIRONMENTAL NOISE SETTING

3.1 Noise Sensitive Land Uses

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as hospitals, historic sites, cemeteries, and certain recreation areas are considered sensitive to increases in exterior noise levels. Schools, churches, hotels, libraries, and other places where low interior noise levels are essential are also considered noise-sensitive land uses.

The Project is proposing onsite and offsite improvements. The nearest existing noise-sensitive land uses to the Project site are rural residences located on Horsethief Canyon Road as well as residences located in the Horsethief Canyon Ranch Community located directly adjacent to the southern and western Project site boundary. The installation of the proposed offsite water line would occur directly adjacent to a rural residence located on Horsethief Canyon Road.

3.2 Existing Ambient Noise Environment

The most common and significant source of noise in Riverside County is mobile noise generated by transportation-related sources. Other sources of noise are the various land uses (i.e., residential, commercial and institutional) that generate stationary-source noise. The Project site is bound by I-15 to the north which is a major roadway within the County that serves a wide variety of residential, industrial, agricultural and commercial land uses.

3.2.1 Existing Ambient Noise Measurements

The Project site can be characterized by undeveloped land that is largely flat. It is surrounded mainly by a mix of residential and undeveloped land. In order to quantify existing ambient noise levels in the Project area, ECORP Consulting, Inc. conducted three long-term noise measurements, two spanning 24-hours and one spanning 15-hours, between July 6, 2020 and July 9, 2020. The noise measurement sites were representative of typical existing noise exposure within and immediately adjacent to the Project site (see Attachment A). The average noise levels and sources of noise measured at each location are listed in Table 4.

Table 4. Existing (Baseline) Noise Measurements

Location Number	Location	CNEL	Leq dBA	Lmin dBA	Lmax dBA	Time
1	Tucked in shrubs north of the Horsethief Canyon Dog Park and south of Shotgun Trail.	57.3	53.8	33.0	84.7	10:01 a.m.- 3:01 a.m.
2	Tucked in shrubs north of the Horsethief Canyon Recreation Center and south of Mountain Road.	61.8	58.8	33.9	94.0	10:08a.m.-10:08a.m.
3	Unnamed neighborhood park at the intersection of Mountain Road and Bunkerhill Drive.	57.9	56.0	26.3	91.9	10:22a.m.-10:22a.m.

Source: Measurements were taken by ECORP with a Larson Davis SoundExpert LxT precision sound level meter, which satisfies the American National Standards Institute for general environmental noise measurement instrumentation. Prior to the measurements, the SoundExpert LxT sound level meter was calibrated according to manufacturer specifications with a Larson Davis CAL200 Class I Calibrator. See Attachment A for noise measurement outputs.

As shown in Table 4, the ambient recorded noise levels range from 57.3 to 61.8 dBA CNEL and 53.8 to 58.8 dBA L_{eq} near the Project site. The most common noise in the Project vicinity is produced by automotive vehicles (e.g., cars, trucks, buses, motorcycles). Traffic moving along I-15 and other vicinity roadways produces a sound level that remains relatively constant and is part of the Project area's minimum ambient noise level. Vehicular noise varies with the volume, speed and type of traffic. Slower traffic produces less noise than fast-moving traffic. Trucks typically generate more noise than cars. Infrequent or intermittent noise also is associated with vehicles, including sirens, vehicle alarms, slamming of doors, trains, garbage and construction vehicle activity and honking of horns. These noises add to urban noise and are regulated by a variety of agencies.

3.2.2 Existing Roadway Noise Levels

Existing roadway noise levels were calculated for the roadway segments in the Project vicinity. This task was accomplished using the FHWA Highway Traffic Noise Prediction Model (FHWA-RD-77-108) (see Attachment B) and traffic volumes from the Project's Traffic Analysis (Urban Crossroads 2020). The model calculates the average noise level at specific locations based on traffic volumes, average speeds, roadway geometry, and site environmental conditions. The average vehicle noise rates (energy rates) used in the FHWA model have been modified to reflect average vehicle noise rates identified for California by Caltrans. The Caltrans data shows that California automobile noise is 0.8 to 1.0 dBA higher than national levels and that medium and heavy truck noise is 0.3 to 3.0 dBA lower than national levels. The average daily noise levels along these roadway segments are presented in Table 5. It is noted that the existing roadway traffic volumes were conducted prior to the currently ongoing COVID-19 pandemic.

Table 5. Existing (Baseline) Traffic Noise Levels

Roadway Segment	Surrounding Uses	CNEL at 100 feet from Centerline of Roadway
De Palma Road		
North of Indian Truck Trail	Residential & Commercial	58.2
South of Indian Truck Trail	Residential & Commercial	62.5
Horsethief Canyon Road		
South of De Palma Road	Residential	58.0
Hostettler Road		
West of Bolo Court	Residential	49.2
East of Bolo Court	Residential	46.1
Bolo Court		
South of Hostettler Road	Residential	28.2
Lake Street		
South of Temescal Canyon Road	Residential & Industrial	60.5

Source: Traffic noise levels were calculated by ECORP using the FHWA roadway noise prediction model in conjunction with the trip generation rate identified by Urban Crossroads Traffic Engineers (2020). Refer to Attachment B for traffic noise modeling assumptions and results.

Note: A total of 12 intersections were analyzed in the Traffic Impact Study; however, only roadway segments that impact sensitive receptors were included for the purposes of this analysis.

As shown, the existing traffic-generated noise level on Project-vicinity roadways currently ranges from 28.2 to 62.5 dBA CNEL at a distance of 100 feet from the centerline. As previously described, CNEL is 24-hour average noise level with a 5 dBA "weighting" during the hours of 7:00 p.m. to 10:00 p.m. and a 10 dBA "weighting" added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively.

4.0 REGULATORY FRAMEWORK

4.1 Federal

4.1.1 Occupational Safety and Health Act of 1970

OSHA regulates onsite noise levels and protects workers from occupational noise exposure. To protect hearing, worker noise exposure is limited to 90 decibels with A-weighting (dBA) over an eight-hour work shift (29 Code of Regulations 1910.95). Employers are required to develop a hearing conservation program when employees are exposed to noise levels exceeding 85 dBA. These programs include provision of hearing protection devices and testing employees for hearing loss on a periodic basis.

4.2 State

4.2.1 State of California General Plan Guidelines

The State of California regulates vehicular and freeway noise affecting classrooms, sets standards for sound transmission and occupational noise control, and identifies noise insulation standards and airport noise/land-use compatibility criteria. The State of California General Plan Guidelines (State of California 2003), published by the Governor's Office of Planning and Research (OPR), also provides guidance for the acceptability of projects within specific CNEL/L_{dn} contours. The guidelines also present adjustment factors that may be used in order to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.

4.2.2 State Office of Planning and Research Noise Element Guidelines

The State OPR Noise Element Guidelines include recommended exterior and interior noise level standards for local jurisdictions to identify and prevent the creation of incompatible land uses due to noise. The Noise Element Guidelines contain a land use compatibility table that describes the compatibility of various land uses with a range of environmental noise levels in terms of the CNEL.

4.3 Local

4.3.1 County of Riverside General Plan Noise Element

The Project site is located in unincorporated Riverside County and therefore would potentially affect receptors within the County from onsite and offsite sources. The County Noise Element of the General Plan is a comprehensive program for including noise management in the planning process, providing a tool for planners to use in achieving and maintaining land uses that are compatible with existing and future environmental noise levels. The Noise Element identifies noise-sensitive land uses and noise sources and defines areas of noise impact for the purpose of developing programs to ensure that residents, and other noise sensitive land uses in Riverside County will be protected from excessive noise intrusion.

As development proposals are submitted to the County, each is evaluated with respect to the policy provisions in the Noise Element to ensure that noise impacts are reduced through planning and project design. Through implementation of the policies of the Noise Element, the County of Riverside seeks to reduce or avoid adverse noise impacts for the purposes of protecting the general health, safety, and welfare of the community.

The most basic planning strategy to minimize adverse impacts on new land uses due to noise is to avoid designating certain land uses at locations within the County that would negatively affect noise sensitive land uses. Uses such as schools, hospitals, child care, senior care, congregate care, churches, and all types of residential use should be located outside of any area anticipated to exceed acceptable noise levels as

defined by the Noise and Land Use Compatibility Guidelines, or should be protected from noise through sound attenuation measures such as site and architectural design and sound walls. The County's Noise and Land Use Compatibility Guidelines Serve as a basis for planning decisions based on noise considerations. These guidelines are shown in Table 6. In the case that the noise levels identified at a proposed project site fall within levels considered normally acceptable, the project is considered compatible with the existing noise environment.

Table 6. Land Use Compatibility for Community Noise Environments

Land Use Category	Community Noise Exposure (CNEL)			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential – Low Density, Single-Family, Duplex, Mobile Homes	50 – 60	55 – 70	70 – 75	75 – 85
Residential – Multiple Family	50 – 65	60 – 70	70 – 75	75 – 85
Transient Lodging – Motel, Hotels	50 – 65	60 – 70	70 – 80	80 – 85
Schools, Libraries, Churches, Hospitals, Nursing Homes	50 – 70	60 – 70	70 – 80	80 – 85
Auditoriums, Concert Halls, Amphitheaters	NA	50 – 70	65 – 85	NA
Sports Arenas, Outdoor Spectator Sports	NA	50 – 75	70 – 85	NA
Playgrounds, Neighborhood Parks	50 – 70	NA	67.5 – 75	72.5 – 85
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50 – 75	NA	70 – 80	80 – 85
Office Buildings, Business, Commercial & Professional	50 – 70	67.5 – 77.5	NA	75 – 85
Industrial, Manufacturing, Utilities, Agriculture	50 – 75	70 – 80	NA	75 – 85

Source: County of Riverside 2015

Notes:

NA: Not Applicable; CNEL: Community Noise Equivalent Level

Normally Acceptable – Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

Conditionally Acceptable – New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

Normally Unacceptable – New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

Clearly Unacceptable – New construction or development should generally not be undertaken.

The Noise Element also contains policies that must be used to guide decisions concerning land uses that are common sources of excessive noise levels. The following relevant and applicable policies from the County's Noise Element have been identified for the Project:

N 1.1: Protect noise-sensitive land uses from high levels of noise by restricting noise-producing land uses from these areas. If the noise-producing land use cannot be relocated, then noise buffers such as setbacks, landscaping, or block walls shall be used.

N 1.2: Guide noise-tolerant land uses into areas irrevocably committed to land uses that are noise-producing, such as transportation corridors or within the projected noise contours of any adjacent airports.

N 1.3: Consider the following uses noise-sensitive and discourage these uses in areas in excess of 65 CNEL:

- Schools
- Hospitals
- Rest Homes
- Long Term Care Facilities
- Mental Care Facilities
- Residential Uses
- Libraries
- Passive Recreation Uses
- Places of Worship

According to the State of California Office of Planning and Research General Plan Guidelines, an acoustical study may be required in cases where these noise-sensitive land uses are located in an area of 60 CNEL or greater. Any land use that is exposed to levels higher than 65 CNEL will require noise attenuation measures.

Areas around airports may have different noise standards than those cited above. Each Area Plan affected by a public-use airport includes one or more Airport Influence Areas, one for each airport. The applicable noise compatibility criteria are fully set forth in Appendix L-1 [of the General Plan] and summarized in the Policy Area section of the affected Area Plan.

N 1.4: Determine if existing land uses will present noise compatibility issues with proposed projects by undertaking site surveys.

N 1.5 Prevent and mitigate the adverse impacts of excessive noise exposure on the residents, employees, visitors, and noise-sensitive uses of Riverside County.

N 1.7: Require proposed land uses, affected by unacceptably high noise levels, to have an acoustical specialist prepare a study of the noise problems and recommend structural and site design features that will adequately mitigate the noise problem.

N 2.3: Mitigate exterior and interior noises to the levels listed in Table N-2 [Table 7 below] below to the extent feasible, for stationary sources:

Table 7. Stationary Source Land Use Noise Standards[1] (Residential)		
Time	**Interior Standards**	**Exterior Standards**
10:00 p.m. to 7:00 a.m.	40 L_{eq} (10 minute)	45 L_{eq} (10 minute)
7:00 a.m. to 10:00 p.m.	55 L_{eq} (10 minute)	65 L_{eq} (10 minute)

Source: County of Riverside 2015

Notes: [1]These are only preferred standards; final decision will be made by the Riverside County Planning Department and Office of Public Health.

N 3.3: Ensure compatibility between industrial development and adjacent land uses. To achieve compatibility, industrial development projects may be required to include noise mitigation measures to avoid or minimize project impacts on adjacent uses.

N 4.1: Prohibit facility-related noise received by any sensitive use from exceeding the following worst-case noise levels:

a. 45 dBA-10-minute L_{eq} between 10:00 p.m. and 7:00 a.m.

b. 65 dBA-10-minute L_{eq} between 7:00 a.m. and 10:00 p.m.

N 4.2: Develop measures to control non-transportation noise impacts.

N 4.3: Ensure any use determined to be a potential generator of significant stationary noise impacts be properly analyzed and ensure that the recommended mitigation measures are implemented.

N 4.5: Encourage major stationary noise-generating sources throughout the County of Riverside to install additional noise buffering or reduction mechanisms within their facilities to reduce noise generation levels to the lowest extent practicable prior to the renewal of conditional use permits or business license or prior to the approval and/or issuance of new conditional use permits for said facilities.

N 4.8: Require that the parking structures, terminals, and loading docks of commercial or industrial land uses be designed to minimize the potential noise impacts of vehicles on the site as well as on adjacent land uses.

N 6.3: Require commercial or industrial truck delivery hours be limited when adjacent to noise sensitive land uses unless there is no feasible alternative or there are overriding transportation benefits.

N 12.1: Utilize natural barrier such as hills, berms, boulders, and dense vegetation to assist in noise reduction.

N 13.1: Minimize the impacts of construction noise on adjacent uses within acceptable practices.

N 13.2: Ensure that construction activities are regulated to establish hours of operation in order to prevent and/or mitigate the generation of excessive or adverse noise impacts on surrounding areas.

N 13.4: Require that all construction equipment utilizes noise reduction features (e.g. mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer.

N 14.1: Enforce the California Building Standards that sets standards for building construction to mitigate interior noise levels to the tolerable 45 CNEL limit. These standards are utilized in conjunction with the Uniform Building Code by the County's Building Department to ensure that noise protection is provided to the public. Some design features may include extra-dense insulation, double-paned windows, and dense construction materials.

N 14.3: Incorporate acoustic site planning into the design of new development, particularly large scale, mixed-use, or master planned development, through measures which may include:

- Separation of noise sensitive building from noise generating sources.
- Use of natural topography and intervening structures to shield noise sensitive land uses.
- Adequate sound proofing within the receiving structure.

N 14.4: Consider and, when necessary, to lower noise to acceptable limits, require noise barriers and landscaped berms.

N 14.5: Consider the issue of adjacent residential land uses when designing and configuring all new, nonresidential development. Design and configure on site ingress and egress points that divert traffic away from nearby noise sensitive land uses to the greatest degree practicable.

N 14.8: Review all development applications for consistency with the standards and policies of the Noise Element of the General Plan.

N 16.2: Consider the following land uses sensitive to vibration:

- Hospitals
- Residential areas
- Concert halls
- Libraries
- Sensitive research operations
- Schools
- Offices

N 16.3: Prohibit exposure of residential dwellings to perceptible ground vibration from passing trains as perceived at the ground or second floor. Perceptible motion shall be presumed to be a motion velocity of 0.01 inches/second over a range of 1 to 100 Hz.

N 19.5: Require new developments that have the potential to generate significant noise impacts to inform impacted users on the effects of these impacts during the environmental review process.

4.3.2 County of Riverside Municipal Code

The County of Riverside's regulations with respect to noise are included in Chapter 9.52, *Noise Regulations*, of the County's Municipal Code. Specifically, Section 9.52.020 exempts construction noise, if one of the following are true:

> 1. Private construction projects located one-quarter of a mile or more from an inhabited dwelling; or
>
> 2. Private construction projects located within one-quarter of a mile from an inhabited dwelling, provided that:
>
> > a. Construction does not occur between the hours of six p.m. and six a.m. during the months of June through September, and
> >
> > b. Construction does not occur between the hours of six p.m. and seven a.m. during the months of October through May.

Additionally, Section 9.52.040, *General Sound Level Standards,* (Riverside County Ordinance No. 847) specifies a maximum operational exterior noise level of 55 dBA L_{eq} for daytime (7:00 a.m.-10:00 p.m.) and 45 dBA L_{eq} for nighttime (10:00 p.m.-7:00 a.m.) for properties designated by the General Plan for residential development.

4.3.3 County of Riverside Board of Supervisors Good Neighbor Policy for Logistics and Warehouse/Distribution Uses

The logistics industry is a well-established sector of the Riverside County economy that has contributed to local job growth, fueled by societal growth trends in e-commerce and coupled with our strategic location along a major trade corridor that connects to the Ports of Los Angeles and Long Beach. It is expected that Riverside County will continue to see strong demand for growth in the logistics industry. However, it is also recognized that the construction and operations of logistics and warehouse projects in close proximity to residences or other sensitive land uses may negatively affect the quality of life of those existing communities. The County of Riverside Board of Supervisors Good Neighbor Policy for Logistics and Warehouse/Distribution Uses provides a framework through which large-scale logistics and warehouse projects, such as that proposed by the Project, can be designed and operated in a way that lessens their impact on surrounding communities and the environment. It is meant to apply Best Management Practices to help minimize potential impacts to sensitive receptors and is intended to be used in conjunction with the County's Land Use Ordinance, which provides development requirements for said projects, and the California Environmental Quality Act (CEQA). This policy provides a series of development and operational criteria applicable to logistics and warehouse projects that include any building larger than 250,000 square feet in size that are implemented to supplement project-level mitigation measures in order to further reduce impacts related to logistics and warehousing development and operations. The specific policy provisions germane to the Project include the following:

> 2.4 Construction contractors shall utilize construction equipment, with properly operating and maintained mufflers, consistent with manufacturers' standards.
>
> 2.5 Construction contractors shall locate or park all stationary construction equipment so that the emitted noise is directed away from sensitive receptors nearest the project site, to the extent practicable.
>
> 2.9 Construction Contractors shall prohibit truck drivers from idling more than five (5) minutes and require operators to turn off engines when not in use, in compliance with the California Air Resources Board regulations.
>
> 3.2 Warehouse/distribution facilities should be generally designed so that truck bays and loading docks are a minimum of 300 feet away from the property line of sensitive receptors, measured from the dock building door. This distance may be reduced if the site design include berms or other similar features to appropriately shield and buffer the sensitive receptors from the active truck operations areas. Other setbacks appropriate to the site's zoning classification shall be incorporated in the design.
>
> 3.4 Driveways shall be placed, to the maximum extent practicable, on streets that do not have fronting sensitive receptors adjacent.
>
> 3.6 Sites shall be densely screened with landscaping along all bordering streets and adjacent sensitive receptors, with trees spaced at no less than 50 feet on center. Fifty percent of the

landscape screening shall include a minimum of 36-inch box trees. Facility operators will be responsible to establish a long-term maintenance mechanism to assure that the landscaping remains in place and functional in accordance with the approved landscaping plan.

3.7 On-site speed bumps shall not be allowed. Truck loading bays and drive aisles shall be designed to minimize truck noise.

3.8 Dock doors shall be located where they are not readily visible from sensitive receptors or major roads. If it is necessary to site dock doors where they may be visible, a method to screen the dock doors shall be implemented. A combination of landscaping, berms, walls, and similar features shall be considered.

3.9 An additional "wing-wall" shall be installed perpendicular to the loading dock areas to further attenuate noise related to truck activities and also address aesthetics by screening the loading area when adjacent to sensitive receptors.

4.3.4 Renaissance Ranch Commerce Center Specific Plan

Proposed Amendment No. 1, Chapter 3 Development Standards, to the Renaissance Ranch Commerce Center Specific Plan contains planning standards to ensure that development of each planning area is consistent with the quality and vision of Riverside County, and to ensure that the design of the Commerce Center accommodates the surrounding offsite land uses. The following standards in the Specific Plan are proposed to reduce noise-related impacts.

(1) Loading docks and truck parking areas shall be visually screened to the extent feasible in conformance with the wall height restrictions and requirements contained in the Development Standards, from the adjacent residential homes to the west and south, I-15 Freeway, Horsethief Canyon Road, and Bolo Court by any combination of walls, landscaping, and/or other screening features or barriers (such as berms).

(2) Within outdoor storage areas, materials or equipment shall be stored to a height no greater than fourteen feet (14'). Outdoor loading and storage areas and loading doors shall be screened, to the extent feasible in conformance with the wall height restrictions and requirements contained in the Development Standards, from view from public streets and/or the adjacent residential homes to the west and south by concrete or masonry walls, tubular steel fencing, and/or landscaping. Any gates shall be lockable. Such walls, fencing, and/or landscaping used as screening shall be of sufficient height to screen all outdoor materials and equipment, tractors and trailers, and loading doors from view of public streets. Screening walls shall be a minimum eight feet (8') in height and shall not exceed fourteen feet (14') in height.

(3) Ground- and roof-mounted exterior mechanical equipment, heating and ventilating, air conditioning, tanks, and other mechanical devices shall be screened to the extent feasible in conformance with the wall height restrictions and requirements contained in the Development Standards, and treated with a neutral color where visible from the adjacent residential homes to the west and south, I-15 Freeway, Horsethief Canyon Road, and Bolo Court.

(5) All manufacturing and processing activities shall be conducted within a wholly-enclosed building.

(6) Products for sale on the premises may be displayed outdoors and unscreened. This is most appropriate for retail businesses such as manufacturing/assembly businesses that produce large items such as boats, RVs, or other similar goods.

4.3.5 Federal Interagency Committee on Noise (FICON)

The County of Riverside relies on the FICON thresholds of significance for evaluating the impact of increased traffic noise. The 2000 FICON findings provide guidance as to the significance of changes in ambient noise levels due to transportation noise sources. FICON recommendations are based on studies that relate aircraft and traffic noise levels to the percentage of persons highly annoyed by the noise. FICON's measure of substantial increase for transportation noise exposure is as follows:

- If the existing ambient noise levels at existing noise-sensitive land uses (e.g. residential, etc.) are less than 60 dBA CNEL and the Project creates a readily perceptible 5 dBA CNEL or greater Project-related noise level increase and the resulting noise level would exceed acceptable exterior noise standards; or
- If the existing noise levels range from 60 to 65 dBA CNEL and the Project creates a barely perceptible 3 dBA CNEL or greater Project-related noise level increase and the resulting noise level would exceed acceptable exterior noise standards; or
- If the existing noise levels already exceed 65 dBA CNEL, and the Project creates a community noise level increase of greater than 1.5 dBA CNEL.

5.0 IMPACT ASSESSMENT

5.1 Thresholds of Significance

The impact analysis provided below is based on the following California Environmental Quality Act Guidelines Appendix G thresholds of significance. The Project would result in a significant noise-related impact if it would produce:

1) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

2) Generation of excessive groundborne vibration or groundborne noise levels.

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.

For purposes of this analysis, Project construction noise is compared to the NIOSH standard of 85 dBA for more than 8 hours per day, since construction work for the proposed Project is anticipated to span a typical workday of 8 hours daily. The increase in transportation-related noise is compared against the FICON recommendation for evaluating the impact of increased traffic noise, as described in section 4.3.5 above. Noise generated onsite is compared against the County Stationary Source Land Use Noise Standards identified in Table 7 above.

5.2 Methodology

This analysis of the existing and future noise environments is based on noise prediction modeling and empirical observations. Predicted construction noise levels for the Project were calculated utilizing the FHWA's Roadway Construction Model (2006). Transportation-source noise levels in the Project vicinity were calculated using the FHWA Highway Noise Prediction Model (FHWA-RD-77-108). Onsite stationary source noise levels have been calculated with the SoundPLAN 3D noise model, which predicts noise propagation from a noise source based on the location, noise level, and frequency spectra of the noise sources as well as the geometry and reflective properties of the local terrain, buildings and barriers. In Section 5.3.2, Project Operational Noise, the size, location and noise producing level of each source used in the SoundPLAN 3D noise model is discussed in detail.

Groundborne vibration levels associated with construction-related activities for the Project were evaluated utilizing typical groundborne vibration levels associated with construction equipment. Potential groundborne vibration impacts related to structural damage and human annoyance were evaluated, taking into account the distance from construction activities to nearby structures and typically applied criteria for structural damage and human annoyance.

5.3 Impact Analysis

5.3.1 Project Construction Noise

Would the Project Result in Short-Term Construction-Generated Noise in Excess of Standards?

Construction noise associated with the proposed Project would be temporary and would vary depending on the nature of the activities being performed. Noise generated would primarily be associated with the operation of off-road equipment for onsite construction activities as well as construction vehicle traffic on area roadways. Construction noise typically occurs intermittently and varies depending on the nature or phase of construction (e.g., land clearing, grading, excavation, building construction, paving). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. Typical operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. 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). During construction, exterior noise levels could negatively affect sensitive land uses in the vicinity of the construction site.

Onsite Construction Noise

Nearby noise-sensitive land uses consist of rural residences located on Horsethief Canyon Road as well as residences located in the Horsethief Canyon Ranch Community located directly adjacent to the southern and western Project site boundaries. As previously described, the County prohibits construction noise between the hours of 6:00 p.m. and 6:00 a.m. during the months of June through September, and between the hours of 6:00 p.m. and 7:00 a.m. during the months of October through May (Municipal Code Chapter 9.52). The County does not promulgate a numeric threshold pertaining to the noise associated with construction. This is due to the fact that construction noise is temporary, short term, intermittent in nature, and would cease on completion of the Project. Furthermore, construction would occur throughout the Project site and would not be concentrated at one point

Additionally, the County of Riverside Board of Supervisors Good Neighbor Policy for Logistics and Warehouse/Distribution Uses contains several policy provisions to limit construction noise. For instance, Provision 2.4 requires that all construction contractors of warehouse projects that include any building larger than 250,000 square feet in size to utilize construction equipment, with properly operating and maintained mufflers, consistent with manufacturers' standards. Provision 2.5 states that construction contractors must locate or park all stationary construction equipment so that the emitted noise is directed away from sensitive receptors nearest the Project site, to the extent practicable. Lastly, Provision 2.9 requires construction contractors to prohibit truck drivers from idling more than five minutes and require operators to turn off engines when not in use. All construction would be required to adhere to the best management practices established in the County of Riverside Board of Supervisors Good Neighbor Policy for Logistics and Warehouse/Distribution Uses.

To estimate the worst-case onsite construction noise levels that may occur at the nearest noise-sensitive receptor in the Project vicinity, typical construction equipment noise levels were calculated using the Roadway Noise Construction Model and compared against the construction-related noise level threshold established in the Criteria for a Recommended Standard: Occupational Noise Exposure prepared in 1998 by National Institute for Occupational Safety and Health (NIOSH). A division of the US Department of Health and Human Services, NIOSH identifies a noise level threshold based on the duration of exposure to the source. The NIOSH construction-related noise level threshold starts at 85 dBA for more than 8 hours per day; for every 3-dBA increase, the exposure time is cut in half. This reduction results in noise level thresholds of 88 dBA for more than 4 hours per day, 92 dBA for more than 1 hour per day, 96 dBA for more than 30 minutes per day, and up to 100 dBA for more than 15 minutes per day. For the purposes of this analysis, the lowest, more conservative threshold of 85 dBA L_{eq} is used as an acceptable threshold for construction noise at the nearby sensitive receptors.

The anticipated short-term construction noise levels generated for the necessary equipment were calculated using the Roadway Noise Construction Model for the site preparation, grading, building construction, paving and painting anticipated for the proposed Project. Consistent with FTA recommendations for calculating construction noise, construction noise was measured from the center of the Project site (FTA 2018). The anticipated short-term construction noise levels generated for the necessary equipment is presented in Table 8.

Table 8. Construction Average (dBA) Noise Levels at Nearest Receptor- Project Site			
Equipment	**Estimated Exterior Construction Noise Level at Nearest Residences**	**Construction Noise Standards (dBA Leq)**	**Exceeds Standards?**
Site Preparation			
Rubber Tired Dozer (6)	55.7 (each)	*85*	**No**
Tractors/Loaders/Backhoes (8)	58.0 (each)	*85*	**No**
Combined Site Preparation Equipment	**68.6**	*85*	**No**
Grading			
Excavators (4)	54.7 (each)	*85*	**No**
Graders (2)	59.0 (each)	*85*	**No**
Rubber Tired Dozers (2)	55.7 (each)	*85*	**No**
Scrapers (4)	57.6 (each)	*85*	**No**
Tractors/Loaders/Backhoes (4)	58.0 (each)	*85*	**No**
Combined Grading Equipment	**69.2**	*85*	**No**
Building Construction, Paving & Painting			
Cranes (2)	50.6 (each)	*85*	**No**
Forklifts (6)	57.4 (each)	*85*	**No**
Generator Sets (2)	55.6 (each)	*85*	**No**
Tractors/Loaders/Backhoes (6)	58.0 (each)	*85*	**No**
Welders (2)	48.0 (each)	*85*	**No**
Pavers (4)	52.2 (each)	*85*	**No**
Paving Equipment (4)	60.5 (each)	*85*	**No**
Rollers (4)	51.0 (each)	*85*	**No**
Air Compressors (2)	51.7 (each)	*85*	**No**
Combined Building Construction, Paving & Paining Equipment	**71.5**	*85*	**No**

Source: Construction noise levels were calculated by ECORP Consulting using the FHWA Roadway Noise Construction Model (FHWA 2006). Refer to Attachment C for Model Data Outputs.

Notes: Construction equipment used during construction derived from CalEEMod 2016.3.2. The distance to the nearest residence was measured from the center of Planning Area 1 (Business Park) to the rural residence located directly adjacent to the western Project site boundary, approximately 630 feet distant.

L_{eq} = The equivalent energy noise level, is the average acoustic energy content of noise for a stated period of time. Thus, the Leq 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.

As shown in Table 8, during onsite construction activities no individual or cumulative piece of construction equipment would exceed the NIOSHA threshold of 85 dBA L_{eq} at the nearest potential receptors to onsite construction.

Offsite Construction Noise

Offsite construction noise would result from the installation of offsite water improvements on Horsethief Canyon Road, between the northwest corner of the Project site and an existing point of connection located north of I-15. Nearby noise-sensitive land uses consist of a residential land use approximately 25 feet distant. This activity would include excavators, backhoes, pavers, and other equipment. The anticipated short-term offsite construction noise levels generated for the necessary equipment is presented in Table 9**.** Offsite construction noise will be compared to the NIOSH construction noise threshold of 85 dBA L_{eq}.

Table 9. Construction Average (dBA) Noise Levels at Nearest Receptor- Offsite

Equipment	Estimated Exterior Construction Noise Level at Nearest Residence	Construction Noise Standards (dBA Leq)	Exceeds Standards?
Site Preparation			
Graders (1)	87.0	85	**Yes**
Tractors/Loaders/Backhoes (1)	86.0	85	**Yes**
Combined Site Preparation Equipment	89.6	*85*	**Yes**
Instillation of Water Line (Trenching)			
Forklifts (1)	85.4	*85*	**Yes**
Tractors/Loaders/Backhoes (1)	86.0	*85*	**Yes**
Excavators (1)	82.8	*85*	**Yes**
Concrete/Industrial Saws (1)	88.6	*85*	**Yes**
Combined Trenching Equipment	**92.2**	*85*	**Yes**
Paving & Painting			
Cement and Mortar Mixers (1)	80.8	*85*	**No**
Pavers (1)	80.2	*85*	**No**
Rollers (1)	79.0	*85*	**No**
Tractors/Loaders/Backhoes (1)	86.0	*85*	**No**
Air Compressors (1)	79.7	*85*	**No**
Combined Paving & Painting Equipment	**89.0**	*85*	**No**

Source: Construction noise levels were calculated by ECORP Consulting using the FHWA Roadway Noise Construction Model (FHWA 2006). Refer to Attachment C for Model Data Outputs.

Notes: Construction equipment used during construction derived from CalEEMod 2016.3.2. The distance to the nearest residence is approximately 25 feet distant.

L_{eq} = The equivalent energy noise level, is the average acoustic energy content of noise for a stated period of time. Thus, the Leq 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.

As shown, construction noise levels would exceed the NIOSH noise threshold of 85 dBA at the adjacent sensitive receptor during offsite improvements. It is recommended that the implementation of temporary noise barriers be used during Project construction. Noise barriers or enclosures can provide a sound reduction of 35 dBA or greater (WEAL 2000). To be effective, a noise enclosure/barrier must physically fit in the available space, must completely break the line of sight between the noise source and the receptors, must be free of degrading holes or gaps, and must not be flanked by nearby reflective surfaces. Noise barriers must be sizable enough to cover the entire noise source and extend lengthwise and vertically as far as feasibly possible to be most effective. The limiting factor for a noise barrier is not the component of noise transmitted through the material, but rather the amount of noise flanking around

and over the barrier. In the case of offsite Project construction, an enclosure/barrier would only be necessary at the area of the construction site where noise producing activities are being performed.

Therefore, the following mitigation is recommended.

Recommended Mitigation Measure

NOI-1: In order to reduce construction noise during the site preparation, instillation of water line (trenching), paving and painting phases for offsite construction, a temporary noise barrier or enclosure shall be positioned between the construction site and the neighboring residence to the east of the site in a manner that breaks the line of sight between the construction equipment and the residence. The temporary noise barrier shall have a sound transmission class (STC) of 10 or greater in accordance with American Society for Testing and Materials Test Method E90, or at least 2 pounds per square foot to ensure adequate transmission loss characteristics. The temporary noise barrier can consist of a solid plywood fence at least 7/16-inch in thickness and/or flexible sound curtains, such as an 18-ounce tarp or a 2-inch-thick fiberglass blanket, attached to chain link fencing. The length, height, and location of the temporary noise barrier shall be adequate to assure proper acoustical performance. Specifically, the barrier must completely break the line of sight between the construction site and the residences to the east, must be free of degrading holes or gaps, and must not be flanked by nearby reflective surfaces. All noise control barrier walls shall be designed to preclude structural failure due to such factors as winds, shear, shallow soil failure, earthquakes, and erosion.

Mitigation Measure NOI-1 would substantially reduce offsite construction-generated noise levels. As previously described, noise barriers or enclosures such as that recommended in Mitigation Measure NOI-1 can provide a sound reduction 35 dBA or greater (WEAL 2000), which would be a reduction robust enough to maintain construction noise levels less than 85 dBA (92.2 dBA – 35 dBA = 57.2 dBA). Temporary noise barriers can consist of a solid plywood fence and/or flexible sound curtains, such as an 18-ounce tarp or a 2-inch-thick fiberglass blanket attached to chain link fencing. Therefore, Project construction activities would not expose persons to and generate noise levels in excess of County standards with implementation of NOI-1.

5.3.2 Project Operational Noise

Would the Project Result in a Substantial Permanent Increase in Ambient Noise Levels in Excess of County or City Standards During Operations?

As previously described, noise-sensitive land uses are locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Residences, schools, hospitals, guest lodging, libraries, and some passive recreation areas would each be considered noise-sensitive and may warrant unique measures for protection from intruding noise. The existing nearest noise-sensitive land uses to the Project site are rural residences located on Horsethief Canyon Road as well as residences located in the Horsethief Canyon Ranch Community located directly adjacent to the southern and western Project site boundaries.

Operational noise sources associated with the proposed Project include mobile and stationary (i.e., truck maneuverings, warehouse operations) sources.

Operational Offsite Traffic Noise

Future traffic noise levels throughout the Project vicinity (i.e., vicinity roadway segments that traverse noise sensitive land uses) were modeled based on the traffic volumes identified by Urban Crossroads (2020) to determine the noise levels along Project vicinity roadways. Table 10 shows the calculated offsite roadway noise levels under existing traffic levels compared to future build-out of the Project. The calculated noise levels as a result of the Project at affected sensitive land uses are compared to the noise standards promulgated by the County of Riverside and significance thresholds recommended by FICON.

FICON's measure of substantial increase for transportation noise exposure is as follows:

- If the existing ambient noise levels at existing noise-sensitive land uses (e.g. residential, etc.) are less than 60 dBA CNEL and the Project creates a readily perceptible 5 dBA CNEL or greater Project-related noise level increase and the resulting noise level would exceed acceptable exterior noise standards; or
- If the existing noise levels range from 60 to 65 dBA CNEL and the Project creates a barely perceptible 3 dBA CNEL or greater Project-related noise level increase and the resulting noise level would exceed acceptable exterior noise standards; or
- If the existing noise levels already exceed 65 dBA CNEL, and the Project creates a community noise level increase of greater than 1.5 dBA CNEL

Table 10. Existing Plus Project Conditions - Predicted Traffic Noise Levels

Roadway Segment	Surrounding Uses	CNEL at 100 feet from Centerline of Roadway		Noise Standard (dBA CNEL)	Exceed Standard AND result in Noise Levels Exceeding Acceptable Exterior Noise Standards
		Existing Conditions	Existing + Project Conditions		
De Palma Road					
North of Indian Truck Trail	Residential & Commercial	58.2	58.9	>5.0	**No**
South of Indian Truck Trail	Residential & Commercial	62.5	62.6	>3.0	**No**
Horsethief Canyon Road					
South of De Palm Road	Residential	58.0	59.3	>5.0	**No**
Hostettler Road					
West of Bolo Court	Residential	49.2	49.8	>5.0	**No**
East of Bolo Court	Residential	46.1	49.2	>5.0	**No**
Bolo Court					
South of Hostettler Road	Residential	28.2	28.2	>5.0	**No**
Lake Street					
South of Temescal Canyon Road	Residential & Industrial	60.5	61.8	>3.0	**No**

Source: Traffic noise levels were calculated by ECORP Consulting using the FHWA roadway noise prediction model in conjunction with the trip generation rate identified by Urban Crossroads 2020. Refer to Attachment B for traffic noise modeling assumptions and results.
Notes: A total of 12 intersections were analyzed in the Traffic Impact Analysis; however, only roadway segments that impact sensitive receptors were included for the purposes of this analysis.

As shown in Table 10, no roadway segment would experience an increase of noise beyond the FICON significance standards as a result of the Project.

Operational Onsite Stationary Noise

The primary onsite operational noise associated with the proposed Project would be warehouse-related activity, such as trucks idling and maneuvering the site. The County of Riverside's regulations are contained in Section 9.52.040 of the County of Riverside Municipal Code (Riverside County Ordinance No. 847). The maximum exterior operational noise standards for properties designated by the General Plan for residential development, such as that located to the north, east and south of the Project site, are as follows:

- 55 dBA from 7:00 a.m. to 10: 00 p.m. (daytime)
- 45 dBA from 10:00 p.m. to 7:00 a.m. (nighttime).

Stationary source noise levels have been calculated with the SoundPLAN 3D noise model, which predicts noise propagation based on the location, noise level, and frequency spectra of the noise sources as well as the geometry and reflective properties of the local terrain, buildings and barriers. Due to the conceptual nature of the Renaissance Ranch Commerce Center Specific Plan, building size, orientation and location of truck loading docks is currently unknown. As such, a worst-case analysis was preformed, placing noise producing sources such as loading docks and the internal circulation network as close to existing sensitive receptors as permitted, and is represented in the noise model prediction. Below each land use is described and its stationary noise sources are discussed.

Light Industrial

Light Industrial uses are proposed in Planning Area 2 (see Table 1), the largest Planning Area for the proposed Project, and typically attract both passenger car and trailer-truck traffic by accommodating uses such as industrial incubators, light manufacturing, parcel hub, warehouse/storage, fulfillment center, and e-commerce operations. The light industrial land uses, which account for a majority of the Project site, would be the primary operational noise source associated with the proposed Project. These stationary source noises would mainly be attributed to warehouse-related activity, such as trucks idling and maneuvering the site. To represent this in SoundPLAN, an area source measuring 33 feet by 33 feet (10 meters by 10 meters) every 100 feet (30 meters) with a sound power of 79.0 dBA representing potential truck loading dock noise is placed on the perimeter of the Project site closest to existing noise sensitive land uses. 79.0 dBA represents the loudest function of heavy-duty truck maneuvering (backup beepers) (San Jose Loading Dock Noise Study 2014).

Business Park

Business Park uses are proposed in Planning Area 1 (see Table 1) and primarily provide small-scale light industrial, incubator industrial, merchant wholesalers, professional services, hospitality, professional office, small-scale warehousing/ storage, and research and development uses. Similar to the light industrial uses, the main operation noise would be attributed to warehouse activity. 79.0 dBA represents the loudest function of heavy-duty truck maneuvering (backup beepers) according to the San Jose Loading Dock Noise Study (2014). These noise sources were placed on the perimeter of the Project site for the purposes of Project onsite noise modeling. Additionally, area sources of the same size were added along the northern boundary adjacent to I-15.

Noise generated by internal circulation on internal Project site roadways, such as Street A, was calculated by SoundPLAN based on reference sound power values generated by the FHWA Highway Noise Prediction Model. Modeling parameters were adjusted to reflect the anticipated amount of medium-duty and heavy-duty trucks generated by the Project, as supplied by Urban Crossroads (2020), since these vehicles produce more noise than passenger vehicles. A line source with a noise level of 65.3 dBA was used in SoundPLAN to predict noise propagation specific to internal circulation on the Project site.

Open Space- Conservation and Open Space-Conservation Habitat

Open Space-Conservation, Planning Areas 3 and 4 (see Table 1), are located along the western and southern boundaries to provide a landscape buffer between the Light Industrial land uses within Planning

Area 2 and the existing offsite residential neighborhood to the west and south. This buffer would provide landscaping, manufactured slopes, physical and visual buffering, and screening. Due to the lack of specific information pertaining to the buffer, it was not accounted for in the SoundPLAN noise model, which is conservative. Open Space-Conservation Habitat land uses are proposed in Planning Areas 5 and 6. These areas are intended to be preserved as natural open space and would have no operational noise associated with them as a result of Project operations.

All future operations on the Project site would be required to adhere to the best management practices established in the County of Riverside Board of Supervisors Good Neighbor Policy for Logistics and Warehouse/Distribution Uses. For instance, as modeled in SoundPLAN, warehouse/distribution facilities would be generally designed so that truck bays and loading docks are a minimum of 300 feet away from the property line of sensitive receptors, measured from the dock building door, unless noise-reducing berms or other similar features were implemented to appropriately shield and buffer the sensitive receptors from the active truck operations areas. Dock doors must be located where they are not readily visible from sensitive receptors or major roads. An additional "wing-wall" must be installed perpendicular to the loading dock areas to further attenuate noise related to truck activities when adjacent to sensitive receptors.

Additionally, the Renaissance Ranch Commerce Center Specific Plan planning document contains planning standards to ensure that development of the light industrial, business park and open space areas are consistent with the quality and vision of Riverside County, and to ensure that the design of the Commerce Center accommodates the surrounding offsite land uses. For instance, the Specific Plan mandates that all future loading docks and truck parking areas must be visually screened from the adjacent residential homes to the west and south, I-15 Freeway, Horsethief Canyon Road, and Bolo Court by any combination of walls, landscaping, and/or other screening features or barriers (such as berms). Outdoor loading and storage areas and loading doors must be screened from view public streets and/or the adjacent residential homes to the west and south by concrete or masonry walls, tubular steel fencing, and/or landscaping. Such walls, fencing, and/or landscaping used as screening must be a minimum eight feet in height and must be of sufficient height to screen all equipment, tractors and trailers, and loading doors from view. Further, all manufacturing and processing activities must be conducted within a wholly enclosed building.

As previously stated, SoundPLAN was used to model operational noise on a worst-case basis and no future noise-reducing barriers were accounted due to the conceptual nature of the Project. The placement and position of all future buildings and loading docks are not yet proposed. Therefore, all noise producing sources were placed as close to existing and future sensitive receptors as possible, though accounting for the 300-foot buffer required by the best management practices established in the County of Riverside Board of Supervisors Good Neighbor Policy for Logistics and Warehouse/Distribution Uses as well as the 75 feet of open space-conservation land located on the south and west Project site boundary. While the orientation of the buildings is currently unknown, noise could further be reduced by intervening structures (i.e. buildings or structures between noise producing sources and sensitive receptors). Generally, a single row of detached buildings between the receptor and the noise source reduces the noise level by about five dBA (FHWA 2006). Additionally, as stated in the Renaissance Ranch Commerce Center Specific Plan,

there shall be no loading docks on the building facades facing Street A, Bolo Court, or the adjacent residential homes to the west and south. The Specific Plan also mandates that outdoor loading doors, service docks and equipment areas should be oriented or screened to reduce visibility from public roads and public accessible locations. The Good Neighbor Policy for Logistics and Warehouse/Distribution Uses requires an additional "wing-wall" be installed perpendicular to the loading dock areas to further attenuate noise related to truck activities when adjacent to sensitive receptors. As previously mentioned, a solid wall or berm generally reduces noise levels by 10 to 20 dBA (FHWA 2011). However, the noise reduction provided by the required wing-walls would only occur during the final maneuvers of the delivery truck.

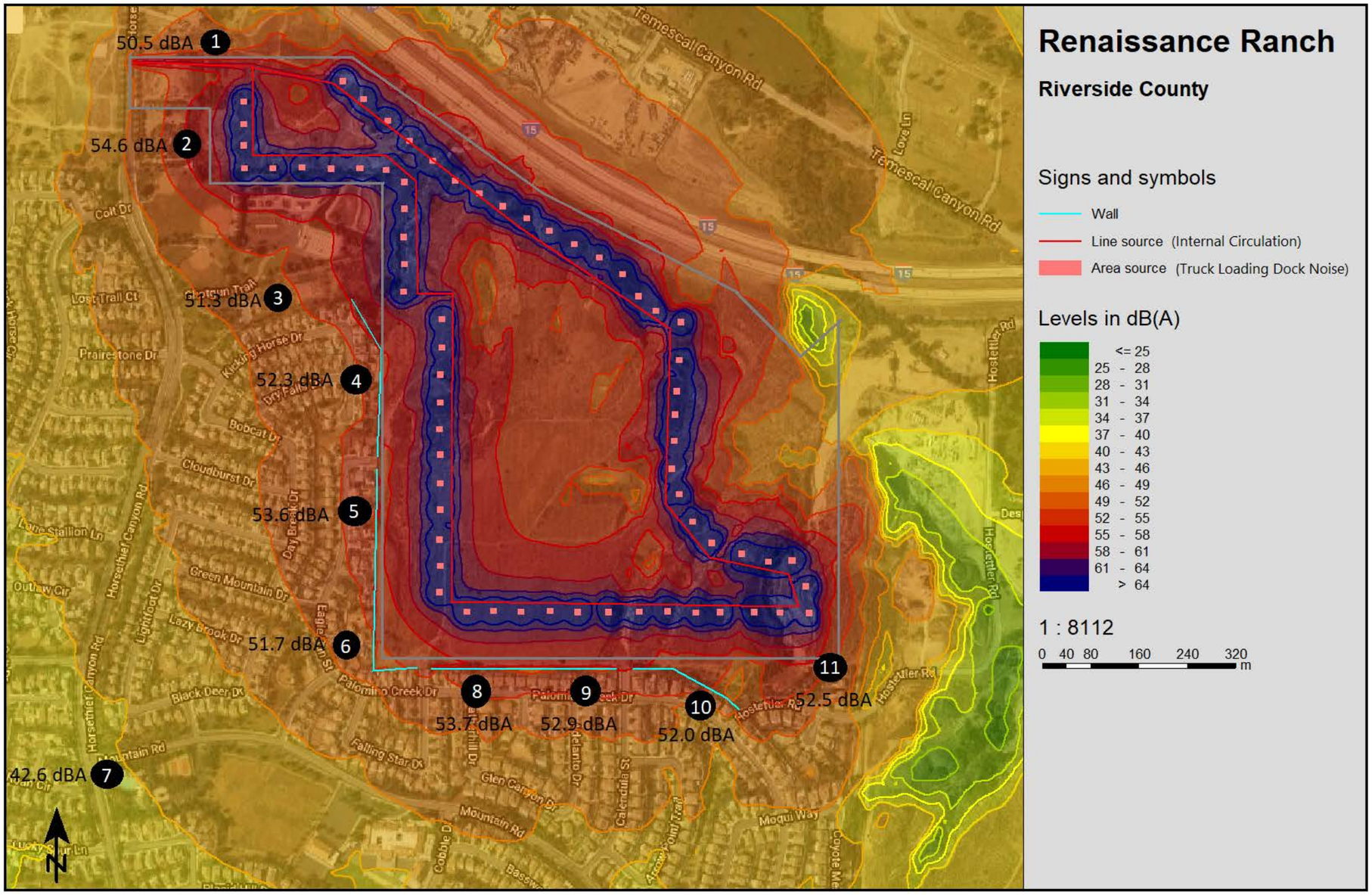
Noise propagation from onsite Project operations, as calculated using the SoundPLAN 3D noise model, (is shown in Table 11, which identifies the predicted Project noise levels at eleven locations in the Project vicinity, . Two of these locations (3 & 7) are where the existing baseline noise measurements were taken (see Table 4), while the additional nine locations are located along the northern, southern and western boundaries of the Project site, adjacent to nearby residential land uses. Additionally, a noise contour graphic (Figure 3. *Project Onsite Source Noise Generation*) has been prepared to depict the predicted noise levels in the Project vicinity as a result of onsite Project operations.

Table 11. Modeled Operational Noise Levels

Site Location	Location	Existing Baseline Noise Measurements (L_{eq} dBA)	Modeled Operational Noise Attributable to Project (L_{eq} dBA)	County Exterior Standards (dBA) (Day/Night)	Exceed Standard? (Day /Night)
1	North of Project site adjacent to rural residence	--	**50.5**	55 / 45	**No / Yes**
2	North of Project site adjacent to rural residence	--	**54.6**	55 / 45	**No / Yes**
3	Tucked in shrubs north of the Horsethief Canyon Dog Park and south of Shotgun Trail	53.8	**51.3**	55 / 45	**No / Yes**
4	West of Project site adjacent to residences located in the Horsethief Canyon Ranch Community	--	**52.3**	55 / 45	**No / Yes**
5	West of Project site adjacent to residences located in the Horsethief Canyon Ranch Community	--	**53.6**	55 / 45	**No / Yes**
6	West of Project site adjacent to residences located in the Horsethief Canyon Ranch Community	--	**51.7**	55 / 45	**No / Yes**
7	Tucked in shrubs north of the Horsethief Canyon Recreation Center and south of Mountain Road	58.8	**42.6**	55 / 45	**No / No**
8	South of Project site adjacent to residences located in the Horsethief Canyon Ranch Community	--	**53.7**	55 / 45	**No / Yes**
9	South of Project site adjacent to residences located in the Horsethief Canyon Ranch Community	--	**52.9**	55 / 45	**No / Yes**
10	South of Project site adjacent to residences located in the Horsethief Canyon Ranch Community	--	**52.0**	55 / 45	**No / Yes**
11	South of Project site adjacent to residences located in the Horsethief Canyon Ranch Community	--	**52.2**	55 / 45	**No / Yes**

Source: Stationary source noise levels were modeled by ECORP using SoundPLAN 3D noise model. Refer to Attachment D for noise modeling assumptions and results.

Notes: Source noise measurements identify 79.0 dBA for heavy-duty truck maneuvering per the San Jose Loading Dock Noise Study (2014) and 65.3 dBA for internal circulation as calculated by the FHWA Highway Noise Prediction Model. These reference measurements informed the SoundPLAN model to predict Project noise propagation. See Attachment D.



Map Date: *2/24/2021*
Photo (or Base) Source: *SoundPLAN*

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 3. Project Onsite Source Noise Generation

2020-103

As shown in Table 11 and Figure 3, the Project would not surpass the daytime noise standard at any nearby sensitive receptors. However, in the case that the Project operates any time from 10:00 p.m. to 7:00 a.m. (nighttime), operations would potentially exceed the County nighttime noise standard at all noise sensitive receptors located directly adjacent to the northern, western, and southern Project site boundaries. As previously stated, the Project was modeled using a worst-case analysis since a detailed site plan is not available and the hours of operations are unknown at this time.

Since onsite operations would potentially exceed the County nighttime noise standard at nearby sensitive receptors, it is recommended that the provisions in the Renaissance Ranch Commerce Center Specific Plan to visually screen all loading dock and truck parking areas with the employment of walls and/or other solid screening features or barriers (such as berms but not just landscaping) be extended along the southern and western boundaries of Planning Area 2 and the northern, southern and western boundaries of Planning Area 1 to protect the existing residents. Therefore, the following mitigation is recommended for the proposed Project. A reduction of 10 dBA would be robust enough to reduce operational noise levels below the exterior nighttime noise standard (54.6 dBA – 10 dBA = 44.6 dBA), which would be achieved through implementation of the following mitigation.

NOI-2 All loading dock and truck parking areas in the Renaissance Ranch Commerce Center must be visually screened from sensitive residential receptors to the south and west of Planning Area 2 and the north, south and west of Planning Area 1, by walls and/or other solid screening features or barriers (such as berms). The barriers must be constructed with no visible gaps between construction materials or at the base of the barrier.

Mitigation measure NOI-2 would reduce operational noise levels below the exterior nighttime noise standard at the future sensitive noise receptors adjacent to the Project site. Additionally, the manner in which 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 (Caltrans 2002). The exterior-to-interior reduction of newer residential units is generally 30 dBA or more (HMMH 2006). Thus, the Project would not exceed the County's interior noise standards.

As such, noise levels as a result of Project operations would fall below the County's exterior and interior daytime and nighttime noise standards with implementation of the recommended measures above.

5.3.3 Project Construction Groundborne Vibration

Would the Project Expose Structures to Substantial Groundborne Vibration During Construction?

Excessive groundborne vibration impacts result from continuously occurring vibration levels. Increases in groundborne vibration levels attributable to the 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 groundborne vibration, depending on the specific construction equipment used and the operations involved. Ground vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance.

Construction-related ground vibration is normally associated with impact equipment such as pile drivers, jackhammers, and the operation of some heavy-duty construction equipment, such as dozers and trucks. It is noted that pile drivers would not be necessary during Project construction. Vibration decreases rapidly with distance and it is acknowledged that construction activities would occur throughout the Project site and would not be concentrated at the point closest to sensitive receptors. Groundborne vibration levels associated with construction equipment are summarized in Table 12.

Table 12. Representative Vibration Source Levels for Construction Equipment

Equipment Type	Peak Particle Velocity at 25 Feet (inches per second)
Large Bulldozer	0.089
Caisson Drilling	0.089
Loaded Trucks	0.076
Hoe Ram	0.089
Jackhammer	0.035
Small Bulldozer/Tractor	0.003
Vibratory Roller	0.210

Source: FTA 2018; Caltrans 2020b

The County does not regulate vibrations associated with construction. However, a discussion of construction vibration is included for full disclosure purposes. For comparison purposes, the County of Riverside standard of 0.01 inch per second RMS for assessing groundborne vibration from rail-related activities, promulgated by County General Plan Policy N 16.3, is used as a threshold. As identified in Table 12 above, this level of ground vibration equates to the range of human perception and is unlikely to cause damage to any type of building.

Onsite Construction

It is acknowledged that construction activities would occur throughout the Project site and would not be concentrated at the point closest to the nearest structure. The nearest land use of concern to onsite construction on the Project site are the rural residences located on Horsethief Canyon Road, adjacent to Planning Area 1.

Based on the representative vibration levels presented for various construction equipment types in Table 12 and the construction vibration assessment methodology published by the FTA (2018), it is possible to estimate the potential Project construction vibration levels. The FTA provides the following equation:

$$[PPVequip = PPVref \times (25/D)^{1.5}].$$

Consistent with FTA recommendations for calculating construction vibration, construction vibration was measured from the center of Planning Area 1 (FTA 2018). Table 13 presents the expected Project related vibration levels at a distance of 200 feet.

Table 13. Onsite Construction Vibration Levels at 200 Feet

Receiver PPV Levels (in/sec)[1]					Peak Vibration	RMS Velocity Levels[2]	Threshold	Exceed Threshold
Large Bulldozer, Caisson Drilling, & Hoe Ram	Loaded Trucks	Jackhammer	Small Bulldozer	Vibratory Roller				
0.0039	0.0033	0.0015	0.0001	0.0092	0.0092	**0.0064**	0.01	**No**

[1]Based on the Vibration Source Levels of Construction Equipment included on Table 12 (FTA 2018).
[2]Vibration levels in PPV are converted to RMS velocity using a 0.70 conversion factor identified by Caltrans (2020b),

As shown in Table 13, vibration as a result of onsite construction activities on the Project site would not exceed 0.01 inch per second RMS at the nearest structure. Thus, onsite project construction would not exceed the recommended threshold.

Offsite Construction

The nearest structure of concern to offsite construction activity is a residence located on Horsethief Canyon Road, approximately 25 feet distant from proposed construction activities. Based on the representative vibration levels presented for various construction equipment types in Table 12 and the construction vibration assessment methodology published by the FTA (2018), offsite Project construction vibration levels have been calculated and are presented in Table 14.

Table 14. Offsite Construction Vibration Levels at 25 Feet

Receiver PPV Levels (in/sec)[1]					Peak Vibration	RMS Velocity Levels[2]	Threshold	Exceed Threshold
Large Bulldozer, Caisson Drilling, & Hoe Ram	Loaded Trucks	Jackhammer	Small Bulldozer	Vibratory Roller				
0.089	0.076	0.035	0.003	0.210	0.210	**0.147**	0.01	**Yes**

[1]Based on the Vibration Source Levels of Construction Equipment included on Table 12 (FTA 2018).
[2]Vibration levels in PPV are converted to RMS velocity using a 0.70 conversion factor identified by Caltrans (2020b),

Based on the Project vibration levels presented in Table 14, ground vibration generated by heavy-duty equipment would be anticipated to exceed the 0.01 inch per second PPV RMS threshold at 25 feet. Thus, the residence located along Horsethief Canyon Road could potentially be negatively affected by typical construction equipment. The following mitigation is recommended for the of construction equipment used for the installation of the proposed water line.

NOI-3 Installation of the proposed water line underneath Horsethief Canyon Road shall be implemented without the use of drilling equipment, large bulldozers, or loaded heavy duty trucks within 25 feet of any structure.

Mitigation measure NOI-3 would prohibit the types of equipment that result in the most intense vibration levels within 25 feet of any structure fronting Horsethief Canyon Road. Implementation of mitigation measure NOI-3 would result in vibration at levels below the threshold of 0.01 inch per second PPV RMS threshold.

5.3.4 Project Operational Groundborne Vibration

Would the Project Expose Structures to Substantial Groundborne Vibration During Operations?

Project operations would not include the use of any stationary equipment that would result in excessive vibration levels. While the Project would accommodate heavy-duty trucks, these vehicles can only generate groundborne vibration velocity levels of 0.006 PPV at 50 feet under typical circumstances. Therefore, the Project would result in negligible groundborne vibration impacts during operations.

5.3.5 Excess Airport Noise

Would the Project Expose People Residing or Working in the Project area to Excessive Airport Noise?

The Project site is located approximately 12 miles northeast of the Perris Valley Aviation Airport. According to Figure 4.15.15 in the County's General Plan EIR, the Project site is located outside of the 65 dBA CNEL noise contours for the Perris Valley Airport and all other airports in the region. The proposed Project would not expose people working on the Project site to excess airport noise levels.

5.3.6 Cumulative Noise

Would the Project Contribute to Cumulatively Considerable Noise During Construction?

Construction activities associated with the proposed Project and other construction projects in the area may overlap, resulting in construction noise in the area. However, construction noise impacts primarily affect the areas immediately adjacent to the construction site. Construction noise for the proposed Project was determined to be less than significant following compliance with the County of Riverside Municipal Code and implementation of mitigation measure NOI-1 and NOI-3. Cumulative development in the vicinity of the Project site could result in elevated construction noise levels at sensitive receptors in the Project area. However, each project would be required to comply with the applicable Municipal Code limitations on construction. Therefore, the Project would not contribute to cumulative impacts during construction.

Would the Project Contribute to Cumulatively Considerable Noise from Traffic?

Year 2040 cumulative traffic noise levels throughout the Project vicinity (i.e., vicinity roadway segments that traverse noise sensitive land uses) were modeled based on the traffic volumes identified by Urban Crossroads (2020) to determine the noise levels along Project vicinity roadways under Year 2040 conditions. Table 15 shows the calculated offsite roadway noise levels under Year 2040 traffic levels without the Project compared to future build-out of the Project in the Year 2040. The calculated noise levels as a result of the Project at affected sensitive land uses are compared to the noise standards promulgated in the County of Riverside and significance thresholds recommended by FICON.

FICON's measure of substantial increase for transportation noise exposure is as follows:

- If the existing ambient noise levels at existing noise-sensitive land uses (e.g. residential, etc.) are less than 60 dBA CNEL and the Project creates a readily perceptible 5 dBA CNEL or greater Project-related noise level increase and the resulting noise level would exceed acceptable exterior noise standards; or
- If the existing noise levels range from 60 to 65 dBA CNEL and the Project creates a barely perceptible 3 dBA CNEL or greater Project-related noise level increase and the resulting noise level would exceed acceptable exterior noise standards; or
- If the existing noise levels already exceed 65 dBA CNEL, and the Project creates a community noise level increase of greater than 1.5 dBA CNEL

Table 15. Cumulative Traffic Noise Scenario

Roadway Segment	Cumulative No Project	Cumulative Plus Project	Noise Standard (dBA CNEL)	Exceed Standard?
	CNEL @ 100 Feet from Roadway Centerline	CNEL @ 100 Feet from Roadway Centerline		
De Palma Road				
North of Indian Truck Trail	63.7	63.8	>3.0	**No**
South of Indian Truck Trail	65.4	65.5	>1.5	**No**
Horsethief Canyon Road				
South of De Palm Road	64.6	64.8	>3.0	**No**
Hostettler Road				
West of Bolo Court	50.6	51.0	>5.0	**No**
East of Bolo Court	49.9	51.4	>5.0	**No**
Bolo Court				
South of Hostettler Road	28.2	28.2	>5.0	**No**
Lake Street				
South of Temescal Canyon Road	65.0	65.1	>1.5	**No**

Source: Traffic noise levels were calculated by ECORP Consulting using the FHWA roadway noise prediction model in conjunction with the trip generation rate identified by Urban Crossroads 2020. Refer to Attachment B for traffic noise modeling assumptions and results.

Notes: A total of 12 intersections were analyzed in the Traffic Impact Analysis; however, only roadway segments that impact sensitive receptors were included for the purposes of this analysis.

As shown in Table 15, no roadway segment would generate an increase of noise beyond the FICON significance standards in any scenario. Therefore, no mobile-source cumulative impacts would occur.

Cumulative Stationary Source Noise Impacts

Long-term stationary noise sources associated with the development of the proposed Project, combined with other cumulative projects, could cause local noise level increases. Noise levels associated with the proposed Project and related cumulative projects together could result in higher noise levels than considered separately. As previously described, onsite noise sources associated with the proposed Project was found to be acceptable following implementation of mitigation measure NOI-2. Therefore, the Project would not contribute to cumulative impacts during operations.

6.0 REFERENCES

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WEAL. 2000. *Sound Transmission Sound Test Laboratory Report No. TL 96-186.*

LIST OF ATTACHMENTS

ATTACHMENT A

Baseline (Existing) Noise Measurements – Project Site and Vicinity

Site Number: 1			
Recorded By: Lindsay Liegler			
Job Number: 2020-103			
Date: 7/6/2020			
Time: 10:01 a.m.			
Location: Tucked in shrubs north of the Horsethief Canyon Dog Park and south of Shotgun Trail			
Source of Peak Noise: Vehicles on Shotgun Trail, birds, dogs barking			
Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
53.8	33.0	84.7	116.5

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Larson Davis**	**LxT SE**	**0005120**	**9/14/2020**	
	Microphone	**Larson Davis**	**377B02**	**174464**	**9/14/2020**	
	Preamp	**Larson Davis**	**PRMLxT1L**	**042852**	**9/14/2020**	
	Calibrator	**Larson Davis**	**CAL200**	**14105**	**9/10/2020**	

Weather Data			
Est.	**Duration:** 15 hours		**Sky:** Clear
	Note: dBA Offset = 0.01		**Sensor Height (ft):** 1
	Wind Ave Speed (mph)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	1-2	83	29.94

Photo of Measurement Location

Measurement Report

Report Summary

Meter's File Name	LxT_Data.322	Computer's File Name	SLM_0005120_LxT_Data_322.00.ldbin
Meter	LxT SE		
Firmware	2.302		
User	Lindsay Liegler	Location	
Description			
Note			
Start Time	2020-07-06 10:01:14	Duration	15:08:45.6
End Time	2020-07-07 01:10:00	Run Time	15:08:45.6
		Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	53.8 dB		
LAE	101.1 dB	SEA	--- dB
EA	1.4 mPa²h		
LZ_{peak}	116.5 dB	2020-07-06 10:01:51	
LAS_{max}	84.7 dB	2020-07-06 10:01:51	
LAS_{min}	33.0 dB	2020-07-06 23:17:47	
LA_{eq}	53.8 dB		
LC_{eq}	66.1 dB	LC_{eq} - LA_{eq}	12.3 dB
LAI_{eq}	59.9 dB	LAI_{eq} - LA_{eq}	6.1 dB

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

Community Noise	LDN	LDay	LNight
	56.7 dB	54.5 dB	0.0 dB

	LDEN	LDay	LEve	LNight
	57.3 dB	54.6 dB	54.3 dB	48.9 dB

Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	53.8 dB		66.1 dB		--- dB	
$Ls_{(max)}$	84.7 dB	2020-07-06 10:01:51	--- dB		--- dB	
$LS_{(min)}$	33.0 dB	2020-07-06 23:17:47	--- dB		--- dB	
$L_{Peak(max)}$	--- dB		--- dB		116.5 dB	2020-07-06 10:01:51

Overloads	Count	Duration	OBA Count	OBA Duration
	0	0:00:00.0	40	0:02:29.4

Statistics

LAS 5.0	56.5 dB
LAS 10.0	54.9 dB
LAS 33.3	52.4 dB
LAS 50.0	51.1 dB
LAS 66.6	49.4 dB
LAS 90.0	44.1 dB

Site Number: 2			
Recorded By: Lindsay Liegler			
Job Number: 2020-103			
Date: 7/7/2020			
Time: 10:08 a.m.			
Location: Tucked in shrubs north of the Horsethief Canyon Recreation Center and south of Mountain Road.			
Source of Peak Noise: Vehicles on Mountain Road.			
Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
58.8	33.9	94.0	123.5

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Larson Davis**	**LxT SE**	**0005120**	**9/14/2020**	
	Microphone	**Larson Davis**	**377B02**	**174464**	**9/14/2020**	
	Preamp	**Larson Davis**	**PRMLxT1L**	**042852**	**9/14/2020**	
	Calibrator	**Larson Davis**	**CAL200**	**14105**	**9/10/2020**	

Weather Data			
Est.	**Duration:** 24 hours		**Sky:** Clear
	Note: dBA Offset = 0.01		**Sensor Height (ft):** 1
	Wind Ave Speed (mph)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	2-3	86	30.01

Photo of Measurement Location

Measurement Report

Report Summary

Meter's File Name	LxT_Data.323	Computer's File Name	SLM_0005120_LxT_Data_323.00.ldbin
Meter	LxT SE		
Firmware	2.302		
User	Lindsay Liegler	Location	
Description			
Note			
Start Time	2020-07-07 10:08:29	Duration	24:00:37.7
End Time	2020-07-08 10:16:29	Run Time	24:00:37.7
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	58.8 dB		
LAE	108.2 dB	SEA	144.7 dB
EA	7.3 mPa²h		
LZ_{peak}	123.5 dB	2020-07-08 10:02:39	
LAS_{max}	94.0 dB	2020-07-08 10:00:20	
LAS_{min}	33.9 dB	2020-07-08 00:57:08	
LA_{eq}	58.8 dB		
LC_{eq}	69.4 dB	LC_{eq} - LA_{eq}	10.6 dB
LAI_{eq}	65.9 dB	LAI_{eq} - LA_{eq}	7.1 dB

Exceedances	Count	Duration
LAS > 85.0 dB	11	0:00:30.2
LAS > 115.0 dB	0	0:00:00.0
LZpeak > 135.0 dB	0	0:00:00.0
LZpeak > 137.0 dB	0	0:00:00.0
LZpeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight
	61.5 dB	60.4 dB	0.0 dB

	LDEN	LDay	LEve	LNight
	61.8 dB	61.0 dB	56.2 dB	52.8 dB

Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	58.8 dB		69.4 dB		--- dB	
$Ls_{(max)}$	94.0 dB	2020-07-08 10:00:20	--- dB		--- dB	
$LS_{(min)}$	33.9 dB	2020-07-08 00:57:08	--- dB		--- dB	
$L_{Peak(max)}$	--- dB		--- dB		123.5 dB	2020-07-08 10:02:39

Overloads	Count	Duration	OBA Count	OBA Duration
	7	0:00:14.0	245	0:16:39.8

Statistics

LAS 5.0	62.3 dB
LAS 10.0	58.6 dB
LAS 33.3	49.2 dB
LAS 50.0	46.2 dB
LAS 66.6	43.8 dB
LAS 90.0	40.6 dB

Site Number: 3			
Recorded By: Lindsay Liegler			
Job Number: 2020-103			
Date: 7/8/2020			
Time: 10:22 a.m.			
Location: Unnamed neighborhood park at the intersection of Mountain Road and Bunkerhill Drive.			
Source of Peak Noise: Gardeners/maintenance crew using leaf blowers, birds, dogs barking.			
Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
56.0	26.3	91.9	123.5

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Larson Davis**	**LxT SE**	**0005120**	**9/14/2020**	
	Microphone	**Larson Davis**	**377B02**	**174464**	**9/14/2020**	
	Preamp	**Larson Davis**	**PRMLxT1L**	**042852**	**9/14/2020**	
	Calibrator	**Larson Davis**	**CAL200**	**14105**	**9/10/2020**	

Weather Data			
Est.	**Duration:** 24 hours		**Sky:** Clear
	Note: dBA Offset = 0.01		**Sensor Height (ft):** 1
	Wind Ave Speed (mph)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	2-3	84	29.95

Photo of Measurement Location

Measurement Report

Report Summary

Meter's File Name	LxT_Data.324	Computer's File Name	SLM_0005120_LxT_Data_324.00.ldbin
Meter	LxT SE		
Firmware	2.302		
User	Lindsay Liegler	Location	
Description			
Note			
Start Time	2020-07-08 10:22:22	Duration	24:00:00.0
End Time	2020-07-09 10:22:22	Run Time	24:00:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	56.0 dB		
LAE	105.3 dB	SEA	140.6 dB
EA	3.8 mPa²h		
LZ_{peak}	123.5 dB	2020-07-08 10:23:32	
LAS_{max}	91.9 dB	2020-07-09 09:51:59	
LAS_{min}	26.3 dB	2020-07-08 10:23:54	
LA_{eq}	56.0 dB		
LC_{eq}	67.8 dB	LC_{eq} - LA_{eq}	11.9 dB
LAI_{eq}	65.1 dB	LAI_{eq} - LA_{eq}	9.2 dB

Exceedances

	Count	Duration
LAS > 85.0 dB	9	0:00:12.0
LAS > 115.0 dB	0	0:00:00.0
LZpeak > 135.0 dB	0	0:00:00.0
LZpeak > 137.0 dB	0	0:00:00.0
LZpeak > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight
57.7 dB	57.7 dB	0.0 dB

LDEN	LDay	LEve	LNight
57.9 dB	58.6 dB	50.4 dB	47.6 dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	56.0 dB		67.8 dB		--- dB	
$Ls_{(max)}$	91.9 dB	2020-07-09 09:51:59	--- dB		--- dB	
$LS_{(min)}$	26.3 dB	2020-07-08 10:23:54	--- dB		--- dB	
$L_{Peak(max)}$	--- dB		--- dB		123.5 dB	2020-07-08 10:23:32

Overloads

Count	Duration	OBA Count	OBA Duration
4	0:00:08.2	173	0:19:04.5

Statistics

LAS 5.0	58.4 dB
LAS 10.0	54.7 dB
LAS 33.3	49.4 dB
LAS 50.0	47.2 dB
LAS 66.6	44.4 dB
LAS 90.0	38.7 dB

ATTACHMENT B

Federal Highway Administration Highway Noise Prediction Model (FHWA-RD-77-108) Outputs – Project Traffic Noise

TRAFFIC NOISE LEVELS

Project Number: 2020-103
Project Name: Renaissance Ranch

Background Information

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Analysis Scenario(s): **Existing**
Source of Traffic Volumes: Urban Crossroads
Community Noise Descriptor: L_{dn}: _____ CNEL: x

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%

Traffic Noise Levels

Analysis Condition / Roadway Segment	Land Use	Lanes	Median Width	Peak Hour Volume	ADT Volume	Design Speed (mph)	Dist. from Center	Alpha Factor	Barrier Attn. dB(A)	Vehicle Mix: Medium Trucks	Vehicle Mix: Heavy Trucks	Peak Hou dB(A) L_{eq}	24-Hour dB(A) CNEL
De Palma Road													
North of Indian Truck Trail	Residential & Commercial	2	0	271	2,436	45	100	0	0	1.8%	0.7%	59.6	58.3
South of Indian Truck Trail	Residential & Commercial	2	0	702	6,318	45	100	0	0	1.8%	0.7%	63.7	62.5
Horsethief Canyon Road													
South of De Palma Road	Residential	2	0	465	4,185	35	100	0	0	1.8%	0.7%	59.2	58.0
Hostettler Road													
West of Bolo Court	Residential	2	0	126	1,134	25	100	0	0	1.8%	0.7%	50.5	49.2
East of Bolo Court	Residential	2	0	61	549	25	100	0	0	1.8%	0.7%	47.3	46.1
Bolo Court													
South of Hostettler Road	Residential	2	0	1	9	25	100	0	0	1.8%	0.7%	29.5	28.2
Lake Street													
South of Temescal Canyon Road	Residential & Industrial	2	0	828	7,452	35	100	0	0	1.8%	0.7%	61.7	60.5

TRAFFIC NOISE LEVELS

Project Number: 2020-103
Project Name: Renaissance Ranch

Background Information

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Analysis Scenario(s): **Existing + Project**
Source of Traffic Volumes: Urban Crossroads
Community Noise Descriptor: L_{dn}: _____ CNEL: x

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%

Traffic Noise Levels

Analysis Condition / Roadway Segment	Land Use	Lanes	Median Width	Peak Hour Volume	ADT Volume	Design Speed (mph)	Dist. from Center	Alpha Factor	Barrier Attn. dB(A)	Vehicle Mix: Medium Trucks	Vehicle Mix: Heavy Trucks	Peak Hou dB(A) L_{eq}	24-Hour dB(A) CNEL
De Palma Road													
North of Indian Truck Trail	Residential & Commercial	2	0	304	2,736	45	100	0	0	1.8%	0.7%	60.1	58.9
South of Indian Truck Trail	Residential & Commercial	2	0	726	6,534	45	100	0	0	1.8%	0.7%	63.8	62.6
Horsethief Canyon Road*													
South of De Palm Road	Residential	2	0	594	5,346	35	100	0	0	1.9%	1.0%	60.5	59.3
Hostettler Road													
West of Bolo Court	Residential	2	0	142	1,278	25	100	0	0	1.8%	0.7%	51.0	49.8
East of Bolo Court	Residential	2	0	126	1,134	25	100	0	0	1.8%	0.7%	50.5	49.2
Bolo Court													
South of Hostettler Road	Residential	2	0	1	9	25	100	0	0	1.8%	0.7%	29.5	28.2
Lake Street													
South of Temescal Canyon Road	Residential & Industrial	2	0	861	7,749	35	100	0	0	1.8%	0.7%	61.8	60.6

*Truck trips adjusted to reflect Project feet mix.

TRAFFIC NOISE LEVELS

Project Number: 2020-103
Project Name: Renaissance Ranch

Background Information

Model Description:	FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Analysis Scenario(s):	Cumulative Without Project
Source of Traffic Volumes:	Urban Crossroads
Community Noise Descriptor:	L_{dn}: CNEL: x

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%

Traffic Noise Levels

Analysis Condition / Roadway Segment	Land Use	Lanes	Median Width	Peak Hour Volume	ADT Volume	Design Speed (mph)	Dist. from Center	Alpha Factor	Barrier Attn. dB(A)	Vehicle Mix: Medium Trucks	Vehicle Mix: Heavy Trucks	Peak Hou dB(A) L_{eq}	24-Hour dB(A) CNEL
De Palma Road													
North of Indian Truck Trail	Residential & Commercial	2	0	924	8,316	45	100	0	0	1.8%	0.7%	64.9	63.7
South of Indian Truck Trail	Residential & Commercial	2	0	1,388	12,492	45	100	0	0	1.8%	0.7%	66.7	65.4
Horsethief Canyon Road*													
South of De Palm Road	Residential	2	0	2,004	18,036	35	100	0	0	1.9%	1.0%	65.8	64.6
Hostettler Road													
West of Bolo Court	Residential	2	0	171	1,539	25	100	0	0	1.8%	0.7%	51.8	50.6
East of Bolo Court	Residential	2	0	145	1,305	25	100	0	0	1.8%	0.7%	51.1	49.9
Bolo Court													
South of Hostettler Road	Residential	2	0	1	9	25	100	0	0	1.8%	0.7%	29.5	28.2
Lake Street													
South of Temescal Canyon Road	Residential & Industrial	2	0	2,368	21,312	35	100	0	0	1.8%	0.7%	66.2	65.0

*Truck trips adjusted to reflect Project feet mix.

TRAFFIC NOISE LEVELS

Project Number: 2020-103
Project Name: Renaissance Ranch

Background Information

Model Description:	FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Analysis Scenario(s):	**Cumulative With Project**
Source of Traffic Volumes:	Urban Crossroads
Community Noise Descriptor:	L_{dn}: CNEL: x

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%

Traffic Noise Levels

Analysis Condition / Roadway Segment	Land Use	Lanes	Median Width	Peak Hour Volume	ADT Volume	Design Speed (mph)	Dist. from Center	Alpha Factor	Barrier Attn. dB(A)	Vehicle Mix: Medium Trucks	Vehicle Mix: Heavy Trucks	Peak Hou dB(A) L_{eq}	24-Hour dB(A) CNEL
De Palma Road													
North of Indian Truck Trail	Residential & Commercial	2	0	957	8,613	45	100	0	0	1.8%	0.7%	65.0	63.8
South of Indian Truck Trail	Residential & Commercial	2	0	1,412	12,708	45	100	0	0	1.8%	0.7%	66.7	65.5
Horsethief Canyon Road*													
South of De Palm Road	Residential	2	0	2,133	19,197	35	100	0	0	1.9%	1.0%	66.0	64.8
Hostettler Road													
West of Bolo Court	Residential	2	0	187	1,683	25	100	0	0	1.8%	0.7%	52.2	51.0
East of Bolo Court	Residential	2	0	209	1,881	25	100	0	0	1.8%	0.7%	52.7	51.4
Bolo Court													
South of Hostettler Road	Residential	2	0	1	9	25	100	0	0	1.8%	0.7%	29.5	28.2
Lake Street													
South of Temescal Canyon Road	Residential & Industrial	2	0	2,401	21,609	35	100	0	0	1.8%	0.7%	66.3	65.1

*Truck trips adjusted to reflect Project feet mix.

ATTACHMENT C

Federal Highway Administration Highway Roadway Construction Noise Outputs – Project Construction Noise

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/22/2021
Case Description: Site Preparation- Onsite

Description	**Affected Land Use**
Site Preparation	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Rubber Tired Dozer	No	40		81.7	630
Rubber Tired Dozer	No	40		81.7	630
Rubber Tired Dozer	No	40		81.7	630
Rubber Tired Dozer	No	40		81.7	630
Rubber Tired Dozer	No	40		81.7	630
Rubber Tired Dozer	No	40		81.7	630
Tractors/Loaders/Backhoes	No	40	84		630
Tractors/Loaders/Backhoes	No	40	84		630
Tractors/Loaders/Backhoes	No	40	84		630
Tractors/Loaders/Backhoes	No	40	84		630
Tractors/Loaders/Backhoes	No	40	84		630
Tractors/Loaders/Backhoes	No	40	84		630
Tractors/Loaders/Backhoes	No	40	84		630
Tractors/Loaders/Backhoes	No	40	84		630

	Calculated (dBA)	
Equipment	***Lmax**	**Leq**
Rubber Tired Dozer	59.7	55.7

Rubber Tired Dozer	59.7	55.7
Rubber Tired Dozer	59.7	55.7
Rubber Tired Dozer	59.7	55.7
Rubber Tired Dozer	59.7	55.7
Rubber Tired Dozer	59.7	55.7
Tractors/Loaders/Backhoes	62	58
Tractors/Loaders/Backhoes	62	58
Tractors/Loaders/Backhoes	62	58
Tractors/Loaders/Backhoes	62	58
Tractors/Loaders/Backhoes	62	58
Tractors/Loaders/Backhoes	62	58
Tractors/Loaders/Backhoes	62	58
Tractors/Loaders/Backhoes	62	58
Total	**62**	**68.6**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/22/2021
Case Description: Grading- Onsite

Description	**Affected Land Use**
Grading	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Excavator	No	40		80.7	630
Excavator	No	40		80.7	630
Excavator	No	40		80.7	630
Excavator	No	40		80.7	630
Grader	No	40	85		630
Grader	No	40	85		630
Rubber Tired Dozers	No	40		81.7	630
Rubber Tired Dozers	No	40		81.7	630
Scraper	No	40		83.6	630
Scraper	No	40		83.6	630
Scraper	No	40		83.6	630
Scraper	No	40		83.6	630
Tractors/Loaders/Backhoes	No	40	84		630
Tractors/Loaders/Backhoes	No	40	84		630
Tractors/Loaders/Backhoes	No	40	84		630
Tractors/Loaders/Backhoes	No	40	84		630

Calculated (dBA)

Equipment	*Lmax	Leq
Excavator	58.7	54.7
Excavator	58.7	54.7
Excavator	58.7	54.7
Excavator	58.7	54.7
Grader	63	59
Grader	63	59
Rubber Tired Dozers	59.7	55.7
Rubber Tired Dozers	59.7	55.7
Scraper	61.6	57.6
Scraper	61.6	57.6
Scraper	61.6	57.6
Scraper	61.6	57.6
Tractors/Loaders/Backhoes	62	58
Tractors/Loaders/Backhoes	62	58
Tractors/Loaders/Backhoes	62	58
Tractors/Loaders/Backhoes	62	58
Total	**63**	**69.2**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/22/2021
Case Description: Building Construction, Paving & Painting- Onsite

Description	**Affected Land Use**
Building Construction, Paving & Painting	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Crane	No	16		80.6	630
Crane	No	16		80.6	630
Forklifts	No	40		83.4	630
Forklifts	No	40		83.4	630
Forklifts	No	40		83.4	630
Forklifts	No	40		83.4	630
Forklifts	No	40		83.4	630
Forklifts	No	40		83.4	630
Generator Set	No	50		80.6	630
Tractors/Loaders/Backhoes	No	40	84		630
Generator Set	No	50		80.6	630
Tractors/Loaders/Backhoes	No	40	84		630
Tractors/Loaders/Backhoes	No	40	84		630
Tractors/Loaders/Backhoes	No	40	84		630
Tractors/Loaders/Backhoes	No	40	84		630
Tractors/Loaders/Backhoes	No	40	84		630
Welder	No	40		74	630
Welder	No	40		74	630
Paver	No	50		77.2	630
Paver	No	50		77.2	630

Paver	No	50	77.2	630
Paver	No	50	77.2	630
Paving Equipment	No	20	89.5	630
Paving Equipment	No	20	89.5	630
Paving Equipment	No	20	89.5	630
Paving Equipment	No	20	89.5	630
Roller	No	20	80	630
Roller	No	20	80	630
Roller	No	20	80	630
Roller	No	20	80	630
Air Compressors	No	40	77.7	630
Air Compressors	No	40	77.7	630

Calculated (dBA)

Equipment	***Lmax**	**Leq**
Crane	58.5	50.6
Crane	58.5	50.6
Forklifts	61.4	57.4
Forklifts	61.4	57.4
Forklifts	61.4	57.4
Forklifts	61.4	57.4
Forklifts	61.4	57.4
Forklifts	61.4	57.4
Generator Set	58.6	55.6
Tractors/Loaders/Backhoes	62	58
Generator Set	58.6	55.6
Tractors/Loaders/Backhoes	62	58
Tractors/Loaders/Backhoes	62	58
Tractors/Loaders/Backhoes	62	58
Tractors/Loaders/Backhoes	62	58
Tractors/Loaders/Backhoes	62	58
Welder	52	48
Welder	52	48

Paver		55.2	52.2
Paver		55.2	52.2
Paver		55.2	52.2
Paver		55.2	52.2
Paving Equipment		67.5	60.5
Paving Equipment		67.5	60.5
Paving Equipment		67.5	60.5
Paving Equipment		67.5	60.5
Roller		58	51
Roller		58	51
Roller		58	51
Roller		58	51
Air Compressors		55.7	51.7
Air Compressors		55.7	51.7
	Total	**68.5**	**71.5**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/23/2021
Case Description: Site Preparation- Offsite

Description	**Affected Land Use**
Site Preparation	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Grader	No	40	85		25
Tractors/Loaders/Backhoes	No	40	84		25

Calculated (dBA)

Equipment	***Lmax**	**Leq**
Grader	91	87
Tractors/Loaders/Backhoes	90	86
Total	**91**	**89.6**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/23/2021
Case Description: Instillation of Water Line (Trenching)

Description	**Affected Land Use**
Instillation of Water Line (Trenching)	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Forklifts	No	40		83.4	25
Tractors/Loaders/Backhoes	No	40	84		25
Excavator	No	40		80.7	25
Concrete Saw	No	20		89.6	25

Calculated (dBA)

Equipment	***Lmax**	**Leq**
Forklifts	89.4	85.4
Tractors/Loaders/Backhoes	90	86
Excavator	86.7	82.8
Concrete Saw	95.6	88.6
Total	**95.6**	**92.2**

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 2/23/2021
Case Description: Paving & Painting- Offsite

Description	**Affected Land Use**
Paving & Painting	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**
Cement and Mortar Mixers	No	40		78.8	25
Paver	No	50		77.2	25
Roller	No	20		80	25
Tractors/Loaders/Backhoes	No	40	84		25
Compressor (air)	No	40		77.7	25

Calculated (dBA)

Equipment	***Lmax**	**Leq**
Cement and Mortar Mixers	84.8	80.8
Paver	83.2	80.2
Roller	86	79
Tractors/Loaders/Backhoes	90	86
Compressor (air)	83.7	79.7
Total	**90**	**89**

*Calculated Lmax is the Loudest value.

ATTACHMENT D

SoundPLAN Outputs – Onsite Project Noise

SoundPLAN
Output Source Information

Number	Reciever Name	Floor	Level at Receiver
1	North of Project site adjacent to rural residence	Ground Floor	50.5 dBA
2	North of Project site adjacent to rural residence	Ground Floor	54.6 dBA
3	Tucked in shrubs north of the Horsethief Canyon Dog Park and south of Shotgun Trail	Ground Floor	51.3 dBA
4	West of Project site adjacent to residences located in the Horsethief Canyon Ranch Community	Ground Floor	52.3 dBA
5	West of Project site adjacent to residences located in the Horsethief Canyon Ranch Community	Ground Floor	53.6 dBA
6	West of Project site adjacent to residences located in the Horsethief Canyon Ranch Community	Ground Floor	51.7 dBA
7	Tucked in shrubs north of the Horsethief Canyon Recreation Center and south of Mountain Road	Ground Floor	42.6 dBA
8	South of Project site adjacent to residences located in the Horsethief Canyon Ranch Community	Ground Floor	53.7 dBA
9	South of Project site adjacent to residences located in the Horsethief Canyon Ranch Community	Ground Floor	52.9 dBA
10	South of Project site adjacent to residences located in the Horsethief Canyon Ranch Community	Ground Floor	52 dBA
11	South of Project site adjacent to residences located in the Horsethief Canyon Ranch Community	Ground Floor	52.2 dBA

Number	Noise Source Information	Citation	Level at Source
1	Truck Loading Dock	City of San Jose 2014 Midpoint at 237 Loading Dock Noise Study	79.0 dBA
2	Internal Circulation	FHWA Highway Noise Prediction Model	65.3 dBA