Appendix I

Acoustical Assessment

Acoustical Assessment
9th Street and Vineyard Avenue Warehouse Project
City of Rancho Cucamonga, California

Prepared by:

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TABLE OF CONTENTS

APPENDICES

LIST OF ABBREVIATED TERMS

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

1 INTRODUCTION

This report documents the results of an Acoustical Assessment completed for the 9th Street and Vineyard Avenue Warehouse Project. The purpose of this Acoustical Assessment is to evaluate the potential construction and operational noise and vibration levels associated with the Project and determine the level of impact the Project would have on the environment.

1.1 Project Location

The Project site is located south of E. 9th Street, directly west of Vineyard Avenue, directly north of the Burlington Northern Santa Fe (BNSF) Railway, and directly east of Baker Avenue in the southwestern area of the City of Rancho Cucamonga. The 47-acre site is located approximately one-mile north of Interstate 10 (I-10), four miles west of Interstate 15 (I-15), 2.7 miles south of the Foothill Freeway (SR-210), and 4.2 miles north of State Route 60 (SR-60); refer to Exhibit 1: Regional Map and Exhibit 2: Local Vicinity Map.

1.2 Project Description

The Project is proposing to demolish four existing buildings (two warehouses and two office buildings) and construct three warehouse buildings with ancillary office space and associated parking and landscaping on approximately 46.98 acres. As shown in Exhibit 3: Building Site Configuration, the proposed Project would include three warehouse buildings for a total of 1,037,467 square feet, 415 automobile parking spaces, and 195 trailer parking spaces. Vehicular access to the proposed Project would consist of six project driveways; one on 9th Street, two on Vineyard Avenue, and three on Baker Avenue. All entrances to the site would be unsignalized.

Existing General Plan Land Use and Zoning Designations

The majority of the Project site is zoned General Industrial with a small portion in the northwest corner zoned for Industrial Park. Adjacent properties to the north are zoned for Industrial Park, General Industrial, Medium Density Residential, and General Commercial uses. Properties to the west are zoned Low Density Residential. The BNSF railway and properties zoned for Industrial uses are directly south of the site. The site is bordered to the east by Vineyard Avenue and the Cucamonga Creek, a concrete-lined stormwater drainage channel. Cucamonga Creek originates in the San Gabriel Mountains to the north of the site and flows roughly north to south into the Santa Ana River at the Prado Dam.

Warehouse Facility

The proposed Project consists of three warehouse buildings for a total of 13,000 square feet of office uses and 1,024,467 square feet of warehouse uses for a total of 1,037,467 square feet; refer to Table 1: Building Summary.

Table 1: Building Summary								
Building	**Warehouse (sf)**	**Office 1st Floor (sf)**	**Office 2nd Floor (sf)**	**Total Building (sf)**	**Automobile Parking Stalls**		**Trailer Parking Stalls**	
					Required	**Provided**	**Required**	**Provided**
Building 1	632,580	4,000	0	636,580	195	195	100	148
Building 2	126,531	2,000	2,000	130,531	68	73	13	13
Building 3	265,356	2,500	2,500	270,356	107	147	28	34

Notes:
Square feet (sf)

Site Access

Vehicular access to the proposed Project would consist of six project driveways; one on 9th Street, two on Vineyard Avenue, and three on Baker Avenue. All entrances to the site would be unsignalized.

Parking

The Project provides 415 automobile parking stalls, exceeding the requirement of 370 automobile parking stalls. Additionally, 195 trailer parking stalls are provided.

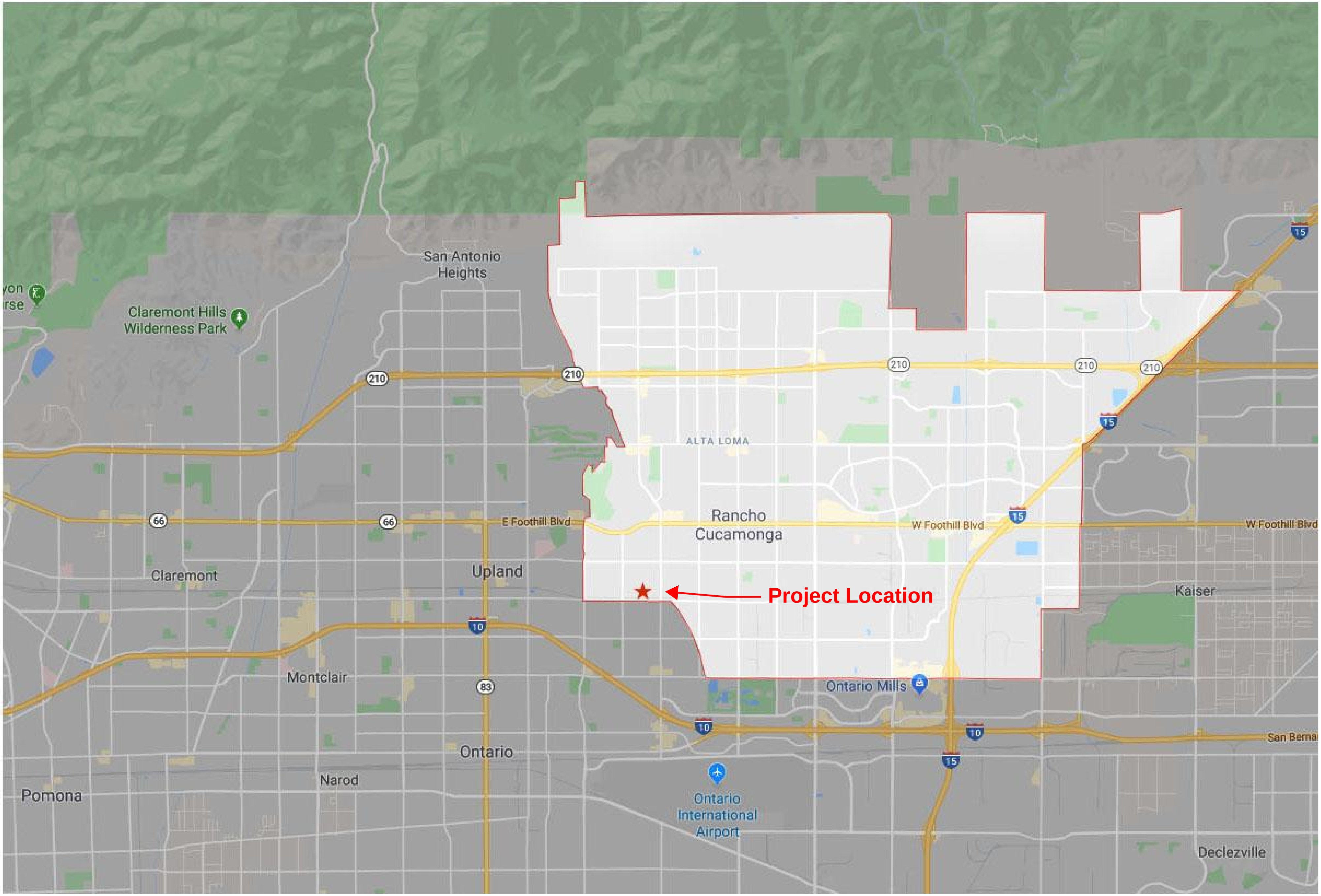

EXHIBIT 1: Regional Map
9th and Vineyard Development Project

EXHIBIT 2: Local Vicinity Map
9th and Vineyard Development Project

Kimley»Horn

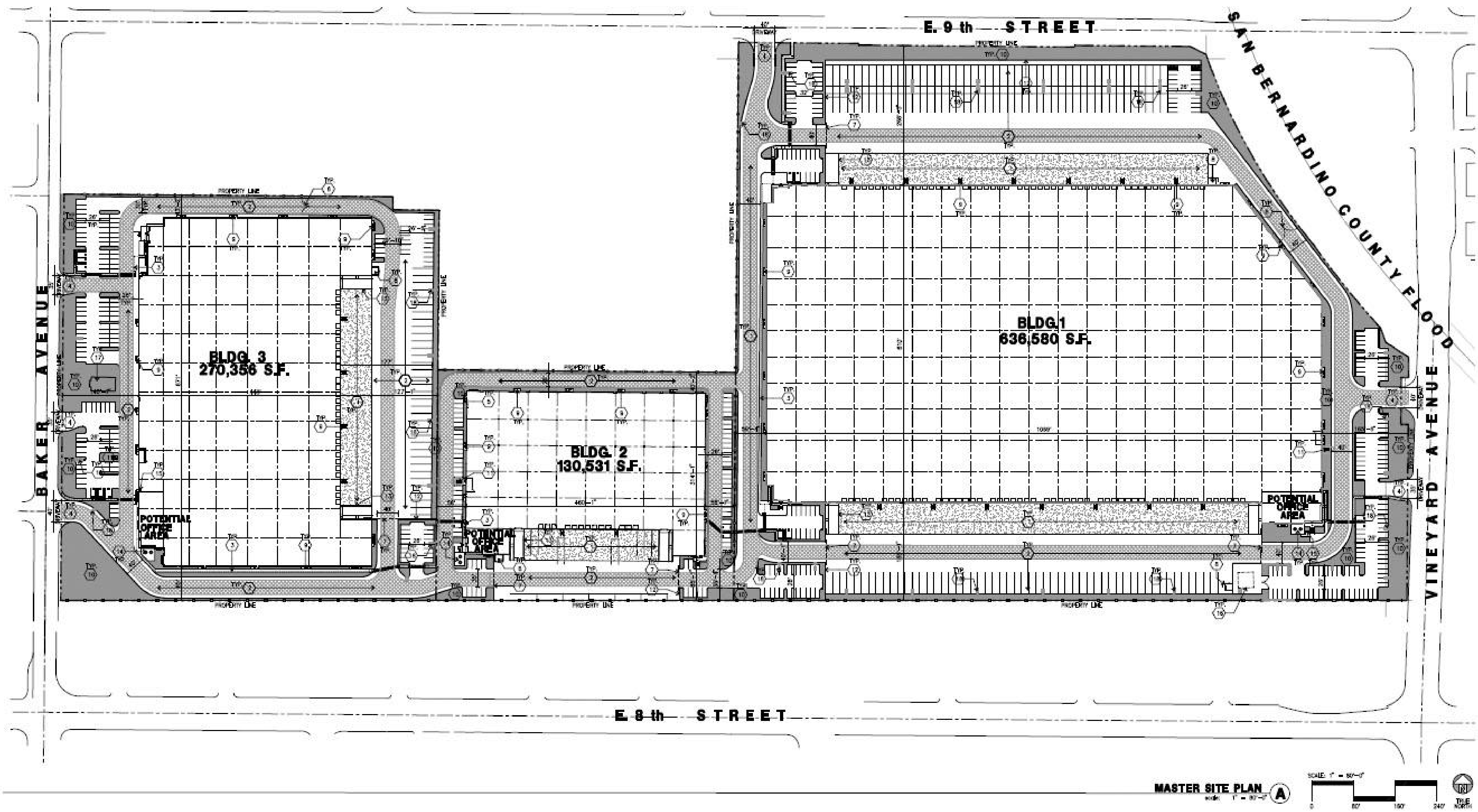

EXHIBIT 3: Building Site Configuration
9th and Vineyard Development Project

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2 ACOUSTIC FUNDAMENTALS

2.1 Sound and Environmental Noise

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

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

Measuring sound directly in terms of pressure would require a large range of numbers. To avoid this, the decibel (dB) scale w0as devised. The dB scale uses the hearing threshold of 20 micropascals (µPa) as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The dB scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels correspond closely to human perception of relative loudness. Table 2: Typical Noise Levels provides typical noise levels.

Table 2: Typical Noise Levels

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

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

Noise Descriptors

The dB scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Several rating scales have been developed to analyze the adverse effect of community noise on people. Because environmental noise fluctuates over time, these scales consider that the effect of noise on people is largely dependent on the total acoustical energy content of the noise, as well as the time of day when the noise occurs. The equivalent noise level (L_{eq}) represents the equivalent continuous sound pressure level over the noise measurement period, while the day-night noise level (L_{dn}) and Community Equivalent Noise Level (CNEL) are measures of sound energy during a 24-hour period, with dB weighted sound levels from 7:00 p.m. to 7:00 a.m. Most commonly, environmental sounds are described in terms of L_{eq} that has the same acoustical energy as the summation of all the time-varying events. Each is applicable to this analysis and defined in Table 3: Definitions of Acoustical Terms.

Table 3: Definitions of Acoustical Terms

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

Source: Compiled from Caltrans, *Technical Noise Supplement to the Caltrans Traffic Noise Analysis Protocol*, September 2013; Cyril M. Harris, *Handbook of Noise Control*, 1979; Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, September 2018.

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

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

A-Weighted Decibels

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

Addition of Decibels

The dB scale is logarithmic, not linear, and therefore sound levels cannot be added or subtracted through ordinary arithmetic. Two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic dB is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70-dBA sound is half as loud as an 80-dBA sound and twice as loud as a 60-dBA sound. [1] When two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dBA higher than one source under the same conditions.[2] Under the dB scale, three sources of equal loudness together would produce an increase of approximately 5 dBA.

Sound Propagation and Attenuation

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

Noise levels may also be reduced by intervening structures; generally, a single row of buildings between the receptor and the noise source reduces the noise level by about 5 dBA, while a solid wall or berm

[1] FHWA, *Noise Fundamentals,* 2017. Available at: https://www.fhwa.dot.gov/environMent/noise/regulations_and_guidance/polguide/polguide02.cfm

[2] Ibid.

[3] California Department of Transportation, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, Page 2-29, September 2013.

reduces noise levels by 5 to 10 dBA.[4] The way older homes in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows.

Human Response to Noise

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

Noise environments and consequences of human activities are usually well represented by median noise levels during the day or night or over a 24-hour period. Environmental noise levels are generally considered low when the CNEL is below 60 dBA, moderate in the 60 to 70 dBA range, and high above 70 dBA. Examples of low daytime levels are isolated, natural settings with noise levels as low as 20 dBA and quiet, suburban, residential streets with noise levels around 40 dBA.[5] Noise levels above 45 dBA at night can disrupt sleep. Examples of moderate-level noise environments are urban residential or semi-commercial areas (typically 55 to 60 dBA) and commercial locations (typically 60 dBA). People may consider louder environments adverse, but most will accept the higher levels associated with noisier urban residential or residential-commercial areas (60 to 75 dBA) or dense urban or industrial areas (65 to 80 dBA). Regarding increases in dBA, the following relationships should be noted[6]:

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

Effects of Noise on People

Hearing Loss

While physical damage to the ear from an intense noise impulse is rare, a degradation of auditory acuity can occur even within a community noise environment. Hearing loss occurs mainly due to chronic exposure to excessive noise but may be due to a single event such as an explosion. Natural hearing loss associated with aging may also be accelerated from chronic exposure to loud noise. The Occupational Safety and Health Administration has a noise exposure standard that is set at the noise threshold where

[4] James P. Cowan, *Handbook of Environmental Acoustics,* 1994.

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

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

hearing loss may occur from long-term exposures. The maximum allowable level is 90 dBA averaged over 8 hours. If the noise is above 90 dBA, the allowable exposure time is correspondingly shorter.

Annoyance

Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The L_{dn} as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources. A noise level of about 55 dBA L_{dn} is the threshold at which a substantial percentage of people begin to report annoyance[7].

2.2 Groundborne Vibration

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

Table 4: Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibrations**,** displays the reactions of people and the effects on buildings produced by continuous vibration levels. The annoyance levels shown in the table should be interpreted with care since vibration may be found to be annoying at much lower levels than those listed, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. In high noise environments, which are more prevalent where groundborne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

Ground vibration can be a concern in instances where buildings shake, and substantial rumblings occur. However, it is unusual for vibration from typical urban sources such as buses and heavy trucks to be perceptible. Common sources for groundborne vibration are planes, trains, and construction activities such as earth-moving which requires the use of heavy-duty earth moving equipment. For the purposes of this analysis, a PPV descriptor with units of inches per second (in/sec) is used to evaluate construction-generated vibration for building damage and human complaints.

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

Table 4: Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibrations

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

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

3 REGULATORY SETTING

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

3.1 State of California

California Government Code

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

Title 24 – Building Code

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

3.2 Local

Plan RC, City of Rancho Cucamonga General Plan Update

The City of Rancho Cucamonga General Plan is a roadmap that encompasses the values and aspirations of the community. The City of Rancho Cucamonga Public Health and Safety Chapter of the 2010 General Plan Update specifies outdoor noise level limits for land uses impacted by transportation noise sources. The City requires that new developments be designed to meet these standards[8]. Noise compatibility can be achieved by avoiding the location of conflicting land uses adjacent to one another, incorporating buffers and noise control techniques including setbacks, landscaping, building transitions, site design, and building construction techniques. Selection of the appropriate noise control technique.

[8] City of Rancho Cucamonga, *General Plan EIR Section 4.12 Noise,* 2010.

City of Rancho Cucamonga Noise Ordinance

A noise ordinance is intended to control unnecessary, excessive, and annoying sounds from stationary, non-transportation noise sources. Noise ordinance requirements are not applicable to mobile noise sources such as heavy trucks traveling on public roadways. Federal and State laws preempt control of mobile noise sources on public roads. Noise ordinance standards generally apply to industrial and commercial noise sources, as well as parks and schools affecting residential areas. The RCMC prohibits the production of excessive noise and is applied to future development within the City to determine potential noise impacts.

Municipal Code Section 17.66.050(F) regulates that at residential uses between the hours of 7:00 a.m. and 10:00 p.m. the exterior and interior noise levels should not exceed 65 dBA and 50 dBA respectively. These are the noise thresholds when measured at the adjacent residential property line (exterior) or within a neighboring home (interior). Between the hours of 10:00 p.m. and 7:00 a.m., the maximum allowable noise limits are 60 dBA and 45 dBA for exterior and interior respectively.

The City has adopted noise standards applicable to industrial areas. The ordinance places industrial areas into three classes. Classes A, B and C represent the industrial park, general industrial, and heavy industrial land uses, respectively. Table 5: Industrial Performance Standards shows the maximum noise levels allowed in each of the three classes.

Section 17.66.050 of the RCMC sets limits on exterior noise levels that are allowed. Noise ordinance limits are specified using the basic noise level as its reference criteria. The RCMC defines the basic noise level as the acceptable noise level within a given area. The City's exterior noise standard puts restrictions on the duration of noises of various magnitudes. The noise ordinance sets the following time limits on noise sources in all residential and commercial districts. These restrictions apply to each noise source.

a) Basic noise level for a cumulative period of not more than 15 minutes in any one hour; or
b) Basic noise level plus five dBA for a cumulative period of not more than 10 minutes in any one hour; or
c) Basic noise level plus 14 dBA for a cumulative period of not more than 5 minutes in any one hour; or
d) Basic noise level plus 15 dBA at any time.

Table 5: Industrial Performance Standards			
Noise Standard	**Class A (Industrial Park)[1]**	**Class B (General Industrial)[2]**	**Class C (Heavy Industrial)[3]**
Exterior Noise Maximum (L_{max})	• 70 dBA • 65 dB (for interior space of neighboring use on same lot) • Noise caused by motor vehicles is exempted from this standard.	• 80 dBA • 65 dB (at residential property line) • Noise caused by motor vehicles and trains is exempted from this standard.	• 85 dBA • 65 dB (at residential property line) • Where a use occupies a lot abutting or is separated by a street from a lot within the designated Class A or B performance standards or residential property, the performance standard of the abutting property shall apply at the common or facing lot line.

Notes:
1. Industrial Park (IP) Zoning District; Class A Performance Standards – The most restrictive of the performance standards to ensure a high- quality working environment and available sites for industrial and business firms whose functional and economic needs require protection from the adverse effects of *noise*, odors, vibration, glare, or high-intensity illumination, and other nuisances.
2. Neo-Industrial (NI) Zoning District; Class B performance standards. These standards are intended to enable a complementary mix of uses and provide for a limited range of industrial activity while assuring a basic level environmental protection. It is the intent of the standards of this section to provide for uses whose operational needs may produce noise, vibration, particulate matter and air contaminants, odors, or humidity, heat, and glare which cannot be mitigated sufficiently to meet the Class A standards. The standards are so designed to protect uses on adjoining sites from effects which could adversely affect their functional and economic viability. 3. Industrial Employment (IE) Zoning District; Class C performance standards. It is the intent of the standards of this section to make allowances for industrial uses whose associated processes produce noise, particulate matter and air contaminants, vibration, odor, humidity, heat, glare, or high-intensity illumination which would adversely affect the functional and economic viability of other uses. The standards, when combined with standards imposed by other governmental agencies, serve to provide basic health and safety protection for persons employed within or visiting the area.

Source: City of Rancho Cucamonga, *Municipal Code Section 17.66.110*, 2019.

Restrictions are shown in Table 6: Exterior Noise Standards in terms of $L_{\%}$ and maximum duration in any given hour. For impulsive or simple tone noise sources, the noise standard for each of the $L_{\%}$ categories is 5 dBA less than it is for noise sources that are neither impulsive nor pure tone.

Table 6: Exterior Noise Standards				
Standard	**L_{25}**	**$L_{16.7}$**	**$L_{8.3}$**	**L_{max}**
Noise Level Limit[1]	BNL	BNL+5 dBA	BNL+14 dBA	BNL+15 dBA
Noise Level Limit (Impulse or Pure Tone)	BNL-5 dBA	BNL	BNL+9 dBA	BNL+10 dBA
Maximum Allowable Time (Within 1-Hour Period Exceeding Limit)	15 minutes	10 minutes	5 minutes	Never Allowed

Notes:
BNL = base noise level (defined as the highest level of background noise considered acceptable while listening to speech discourse); L_{25}, $L_{16.7}$, and $L_{8.3}$ represent $L_{\%}$ values. See above for the definition of $L_{\%}$.
1. Noise that is neither impulsive nor pure tone.

Source: City of Rancho Cucamonga, *Municipal Code Section 17.66.050(C)*, 2019.

Construction Noise Standards

Section 17.66.050(D) (Special Exclusions) of the RCMC indicates that construction is excluded from the provisions of the RCMC. As described in Section 17.66.050(D)(4) of the RCMC, noise sources associated with construction, repair, remodeling, or grading of any real property or during authorized seismic surveys, are exempt provided said activities:

a) When adjacent to a residential land use, school, church or similar type of use, the noise generating activity does not take place between the hours of 8:00 p.m. and 7:00 a.m. on weekdays, including Saturday, or at any time on Sunday or a national holiday, and provided noise levels created do not exceed the noise standard of 65 dBA when measured at the adjacent property line.

b) When adjacent to a commercial or industrial use, the noise generating activity does not take place between the hours of 10:00 p.m. and 6:00 a.m. on weekdays, including Saturday and Sunday, and provided noise levels created do not exceed the noise standards of 70 dBA when measured at the adjacent property line.

It should be noted that RCMC Section 17.66.110 provides special performance standards for industrial uses. As described above, maximum noise levels of 70 dBA, 80 dBA, and 85 dBA are allowed for Class A, B, and C industrial uses, respectively; refer to Table 5. Noise levels at residential property lines are limited to 65 dBA for all industrial classes. Furthermore, according to RCMC Section 17.66.050(C), exceedances of the basic noise level are allowed within certain durations; refer to Table 6. This means that all construction noise shall be such that L_{25} is less than 65 dBA, $L_{16.7}$ is less than 70 dBA, $L_{8.3}$ is less than 79 dBA, and L_{max} is less than 80 dBA to ensure that there are no construction noise impacts.

4 EXISTING CONDITIONS

The Project site is disturbed with existing commercial and industrial facilities developed on nine contiguous parcels; some developed and occupied, others unimproved. The Project site is currently improved with a series of industrial and commercial buildings, a cellular tower and its related support facilities, and a potential historic residential structure. A large portion of the Project site along Baker Avenue is currently undeveloped. Access is currently provided from the existing driveways from Baker Avenue, 9th Street, and Vineyard Avenue.

4.1 Existing Noise Sources

Mobile sources of noise, especially cars and trucks, are the most common and significant sources of noise in most communities including the City of Rancho Cucamonga. Other sources of noise are the various land uses (i.e., residential, commercial, institutional, and recreational and parks activities) throughout the City that generate stationary-source noise. The Ontario International Airport is located approximately 2.3 miles to the south of the Project. The City's southern border is about one mile away from the Ontario International Airport's 65 dBA CNEL noise contour, which is the closest aviation center to the City.[9] As a result, the airport is not considered an existing noise source.

There are several rail lines that run near or through the City. The Burlington Northern Santa Fe (BNSF) rail line lies just south along the southerly boundary of the Project. This rail line serves both BNSF freight trains and the San Bernardino Metrolink service into Los Angeles. Additionally, there are a number of spur lines that run through the industrial area east of Vineyard Ave, north of 8th Street, to serve industrial properties. According to PlanRC, the noise and vibration from these lines do not create a significant noise impact on the City due to their location in the southern area of the City. The Project buildings, landscaping, and window glazing would further help to further attenuate noise create from the existing rail lines.

Mobile Sources

Existing roadway noise levels were calculated for the roadway segments in the project vicinity. This task was accomplished using the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108) and existing traffic volumes from the project traffic analysis (prepared by Kimley-Horn, 2019). The noise prediction model calculates the noise level at specific locations based on traffic volumes, average speeds, roadway geometry, and site environmental conditions. The average vehicle noise rates (also referred to as energy rates) used in the FHWA model have been modified to reflect average vehicle noise rates identified[10] for California by the California Department of Transportation (Caltrans). The Caltrans data indicates that California automobile noise is 0.8 to 1.0 dBA higher than national levels and that medium and heavy truck noise is 0.3 to 3.0 dBA lower than national levels. The average daily noise levels along roadway segments in proximity to the project site are included in Table 7: Existing Traffic Noise Levels.

[9] City of Rancho Cucamonga, *Rancho Cucamonga General Plan Update*, 2021.
[10] California Department of Transportation, *California Vehicle Noise Emission Levels*, 1987.

Table 7: Existing Traffic Noise Levels		
Roadway Segment	**ADT**	**dBA CNEL 100 Feet from Roadway Centerline**
Vineyard Avenue, between Foothill Blvd. and Arrow Route	12,593	69.4
Vineyard Avenue, between Arrow Route and 9th St.	11,678	69.1
Vineyard Avenue, between 9th St. and 8th St.	12,441	69.4
Vineyard Avenue, between 8th St. and 6th St.	12,530	69.4
Vineyard Avenue, between 6th St. and 4th St.	13,587	69.7
Vineyard Avenue, between 4th St. and Jay St.	15,216	70.4
Vineyard Avenue, between Jay St. and Inland Empire Blvd.	16,674	70.8
Vineyard Avenue, between Empire Blvd. and I-10 westbound ramps	17,500	71.0
Vineyard Avenue, between I-10 westbound ramps and I-10 eastbound ramps	16,479	70.7
Baker Avenue, between Arrow Route and 9th St.	2,600	61.0
Baker Avenue, between 9th St. and 8th St.	3,126	61.8
Arrow Route, between Vineyard Ave. and Baker Ave.	8,444	67.7
9th Street, between Vineyard Ave. and Baker Ave.	2,459	61.5
8th Street, between Vineyard Ave. and Baker Ave.	3,618	63.9
Notes: ADT = average daily trips; dBA = A-weighted decibels; CNEL = community noise equivalent level		
Source: Based on traffic data within the *Traffic Impact Study*, prepared by Kimley-Horn, 2019. Refer to Appendix B for traffic noise modeling assumptions and results.		

As depicted in Table 7, the existing traffic-generated noise level on Project-vicinity roadways currently ranges from 61.0 dBA CNEL to 71.0 dBA CNEL 100 feet from the centerline. As previously described, CNEL is a 24-hour 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. The traffic noise modeling assumed the posted speed limits of 45 mph along Vineyard Avenue, Arrow Route, and 8th Street; 35 mph along Baker Avenue; and 40 mph along 9th Street. The CNEL noise level was calculated using a day/evening/night traffic split of 77.7/12.7/9.6 percent. Refer to Appendix B for additional modeling details.

Stationary Sources

The primary sources of stationary noise near the Project are those associated with the surrounding commercial land uses. The noise associated with these sources may represent a single-event noise occurrence or short-term noise. Other noises include dogs barking, residents talking, and general recreational noise.

4.2 Noise Measurements

The Project site currently contains two office buildings and two vacant industrial buildings. To quantify existing ambient noise levels in the Project area, Kimley-Horn conducted four short-term noise measurements on August 8, 2019; see Appendix A: Existing Ambient Noise Measurements. The noise measurement sites were representative of typical existing noise exposure within and immediately adjacent to the Project site. The 10-minute measurements were taken between 9:29 a.m. and 10:27 a.m. near potential sensitive receptors. Short-term L_{eq} measurements are considered representative of the noise levels throughout the day. The noise levels and sources of noise measured at each location are listed in Table 8: Existing Noise Measurements and shown on Exhibit 4: Noise Measurement Locations.

Table 8: Existing Noise Measurements

Site	Location	L_{eq} (dBA)	L_{min} (dBA)	L_{max} (dBA)	Time
1	East 9th Street, West of Woodside Townhomes entrance	65.2	41.5	85.4	9:29 a.m.
2	On parkway of 8558 East 9th Street, behind mailboxes	62.6	39.4	77.5	9:50 a.m.
3	On sidewalk near railroad sign and utility boxes, across from vacant building	63.4	43.7	82.9	10:04 a.m.
4	In parkway next to mailbox of 1668 8th Street	63.4	41.8	77.7	10:17 a.m.

Source: Noise measurements taken by Kimley-Horn, August 8, 2019. See Appendix A for noise measurement results.

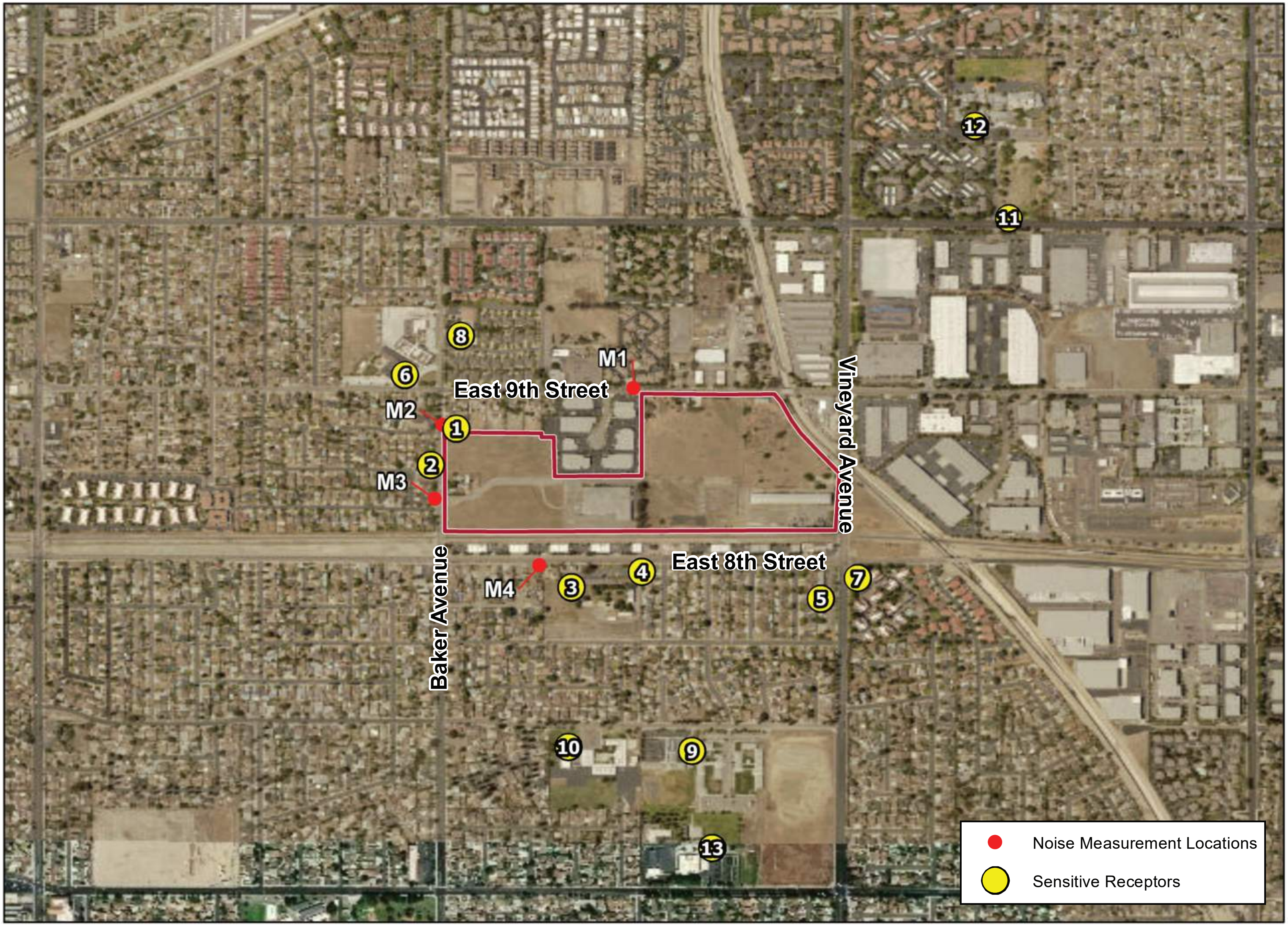

EXHIBIT 4: Noise Measurement Locations
9th and Vineyard Development Project

Not to scale

Kimley»Horn

4.3 Sensitive Receptors

Noise exposure goals for various types of land uses reflect the varying noise sensitivities associated with those uses. Noise sensitive uses typically include residences, hospitals, schools, childcare facilities, and places of assembly. Vibration sensitive receivers are generally similar to noise sensitive receivers but may also include businesses, such as research facilities and laboratories that use vibration-sensitive equipment. Sensitive receptors near the Project site consist mostly of single-family and multi-family residences, religious institutions, educational institutions, and recreational facilities. Sensitive land uses surrounding the Project consist mostly of single-family residential communities. Sensitive land uses nearest to the Project are shown in Table 9: Sensitive Receptors and on Exhibit 4.

Table 9: Sensitive Receptors

Site	Receptor Description	Distance and Direction from the Project
1	Single-Family Residential Community	Adjacent to the north
2	Single-Family Residential Community	80 feet to the west
3	San Antonio Christian School	260 feet to the south
4	Single-Family Residential Community	260 feet to the south
5	Kid's Club	485 feet to the south
6	Los Amigos Elementary School	375 feet to the northwest
7	Single-Family Residential Community	390 feet to the southeast
8	Chinese Christian Family Church	690 feet to the north
9	Dorothy Gibson High School	1,560 feet to the south
10	Arroyo Elementary School	1,560 feet to the south
11	Bear Gulch Park	2,000 feet to the northeast
12	Bear Gulch Elementary School	2,400 feet to the northeast
13	Valley View High School	2,220 feet to the south

5 SIGNIFICANCE CRITERIA AND METHODOLOGY

5.1 CEQA Thresholds

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

- Generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;

- Generate excessive groundborne vibration or groundborne noise levels; and

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

5.2 Methodology

Construction

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

Reference noise levels are used to estimate operational noise levels at nearby sensitive receptors based on a standard noise attenuation rate of 6 dB per doubling of distance (line-of-sight method of sound attenuation for point sources of noise). Noise level estimates do not account for the presence of intervening structures or topography, which may reduce noise levels at receptor locations. Therefore, the noise levels presented herein represent a conservative, reasonable worst-case estimate of actual temporary construction noise.

Operations

The analysis of the Without Project and With Project noise environments is based on noise prediction modeling and empirical observations. Reference noise level data are used to estimate the Project operational noise impacts from stationary sources. Noise levels are collected from field noise measurements and other published sources from similar types of activities are used to estimate noise levels expected with the Project's stationary sources. The reference noise levels are used to represent a worst-case noise environment as noise level from stationary sources can vary throughout the day. Operational noise is evaluated based on the standards within the City's Noise Ordinance and General Plan. The Without Project and With Project traffic noise levels in the Project vicinity were calculated using the FHWA Highway Noise Prediction Model (FHWA-RD-77-108).

Vibration

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

For a building that is constructed with reinforced concrete with no plaster, the FTA guidelines show that a vibration level of up to 0.20 in/sec is considered safe and would not result in any vibration damage. Human annoyance is evaluated in vibration decibels (VdB) (the vibration velocity level in decibel scale) and occurs when construction vibration rises significantly above the threshold of human perception for extended periods of time. The FTA Transit Noise and Vibration Impact Assessment Manual identifies 75 VdB as the approximate threshold for annoyance.

6 POTENTIAL IMPACTS AND MITIGATION

6.1 Acoustical Impacts

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

Construction

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

Construction activities would include site preparation, grading, building construction, paving, and architectural coating. Such activities would require graders, scrapers, and tractors during site preparation; graders, dozers, and tractors during grading; cranes, forklifts, generators, tractors, and welders during building construction; pavers, rollers, mixers, tractors, and paving equipment during paving; and air compressors during architectural coating. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full power operation followed by 3 to 4 minutes at lower power settings. Other primary sources of acoustical disturbance would be random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. Typical noise levels associated with individual construction equipment are listed in Table 10: Typical Construction Noise Levels.

As shown in Table 10, exterior noise levels could affect the nearest existing sensitive receptors in the vicinity. Construction equipment would operate throughout the Project site and the associated noise levels would not occur at a fixed location for extended periods of time. The nearest residences are located approximately 50 feet north of the project site. Section 17.66.050(D)(4)(a) of the Rancho Cucamonga Municipal Code (RCMC) prohibits construction noise from exceeding 65 dBA at the property line of adjacent residential land uses. The Project site is zoned as both General Industrial and Industrial Park, but is surrounded by land zoned as low to medium density Residential. Although the construction equipment noise levels in Table 10 are from FTA's 2018 *Transit Noise and Vibration Impact Assessment Manual*, the noise levels are based on measured data from a U.S. Environmental Protection Agency report which uses data from the 1970s[11], the FHWA Roadway Construction Noise Model which uses data from the early 1990s, and other measured data. Since that time, construction equipment has been required to meet more stringent emissions standards and the additional necessary exhaust systems also reduce noise from what is shown in the table.

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

Table 10: Typical Construction Noise Levels

Equipment	Typical Noise Level (dBA) at 50 feet from Source	Typical Noise Level (dBA) at 1,000 feet from Source[1]
Air Compressor	80	54
Backhoe	80	54
Compactor	82	56
Concrete Mixer	85	59
Concrete Pump	82	56
Concrete Vibrator	76	50
Crane, Derrick	88	62
Crane, Mobile	83	57
Dozer	85	59
Generator	82	56
Grader	85	59
Impact Wrench	85	59
Jack Hammer	88	62
Loader	80	54
Paver	85	59
Pile-driver (Impact)	101	75
Pile-driver (Sonic)	95	69
Pneumatic Tool	85	59
Pump	77	51
Roller	85	59
Saw	76	50
Scraper	85	59
Shovel	82	56
Truck	84	58

[1] Calculated using the inverse square law formula for sound attenuation: $dBA_2 = dBA_1 + 20Log(d_1/d_2)$
dBA_2 = estimated noise level at receptor; dBA_1 = reference noise level; d_1 = reference distance; d_2 = receptor location distance

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

The noise levels calculated in Table 11: Project Construction Noise Levels, show estimated exterior construction noise without accounting for attenuation from existing physical barriers. Residential uses are located surrounding the Project site. Industrial uses are also located across Vineyard Avenue to the east and across 9th Street to the northeast. Since construction noise levels drop off at a rate of about 6 dBA per doubling of distance between the noise source and receptor, the sensitive receptors at the nearest residences would experience noise levels potentially greater than 65 L_{eq} dBA. Noise levels at the closest residences would be lower than the levels shown in Table 11 due to additional attenuation from intervening structures. As depicted in Table 11, construction noise levels located at the property lines of the residential uses would likely exceed the City's 65 dBA standard. Therefore, mitigation would be required to ensure construction noise impacts are reduced to a less than significant level.

Noise source control is the most effective method of controlling construction noise. Source controls, which limit noise, are the easiest to oversee on a construction project. Mitigation at the source reduces the problem everywhere, not just along one single path or for one receiver. Noise path controls are the second method in controlling noise. Barriers or enclosures can provide a substantial reduction in the nuisance effect in some cases. Path control measures include moving equipment farther away from the receiver; enclosing especially noisy activities or stationary equipment; erecting noise enclosures, barriers, or curtains; and using landscaping as a shield and dissipater.

Table 11: Project Construction Noise Levels		
Construction Phase	**Modeled Exterior Construction Noise Level[1]**	
	dBA L_{eq}	**dBA L_{max}**
Demolition	77.4	77.5
Site Preparation	75.6	72.0
Grading	76.2	73.0
Building Construction	77.3	73.0
Paving	74.1	73.0
Architectural Coating	61.6	65.6
1. Distance from the center of the construction area to nearest sensitive receptor per FTA guidelines.		
Source: Federal Highway Administration, *Roadway Construction Noise Model,* 2006. Refer to Appendix B for noise modeling results.		

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 length-wise 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 these cases, the enclosure/barrier system must either be very tall or have some form of roofed enclosure to protect upper-story receptors.

Mitigation Measure NOI-1 would ensure that all construction equipment is equipped with properly operating and maintained mufflers and other State required noise attenuation devices, helping to reduce noise at the source. The FHWA indicates that muffler systems can reduce noise levels by 10 dBA or more.[12] Mitigation Measure NOI-1 also requires construction notices to be sent to adjacent residences, as well as a noise disturbance coordinator to minimize and manage construction noise. Implementation of Mitigation Measure **NOI-2** requires noise monitoring to ensure construction noise levels comply with City standards. If necessary, the use of temporary construction barriers would substantially reduce construction-generated noise levels. According to the Federal Highway Administration, temporary noise barriers or enclosures such as that required by mitigation measure **NOI-2** can provide a sound reduction 20 dBA (FHWA 2011), with a practical reduction of 15 dBA because sound can still travel over the top of the barrier. As project construction could be as high as 77.4 dBA, a 15-dBA reduction would reduce construction noise to levels below the 65 dBA standard. Therefore, implementation of Mitigation Measure **NOI-1** and **NOI-2**, would reduce construction noise impacts to less than significant levels.

Operations

Implementation of the proposed project would create new sources of noise in the project vicinity. The major noise sources associated with the project that would potentially impact existing and future nearby residences include the following:

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

12 Federal Highway Administration, *Special Report - Measurement, Prediction, and Mitigation*, Chapter 4 Mitigation, 2017.

Mechanical Equipment

The Project is surrounded by residential and industrial uses. The nearest sensitive receptors to the Project site are the residences 50 feet to the north on the western edge of the Project boundaries. Potential stationary noise sources related to long-term operation of the project site would include mechanical equipment. Mechanical equipment (e.g. heating ventilation and air conditioning [HVAC] equipment) typically generates noise levels of approximately 52 dBA at 50 feet.[13] HVAC equipment would be roof mounted. As the closest building would be approximately 43 feet from the property line, the worst-case HVAC equipment noise would be 53 dBA based on distance attenuation alone (using the inverse square law of sound propagation)[14]. This noise level conservatively does not include attenuation from intervening parapet walls. Additionally, HVAC equipment would be further away as it is typically centrally located on the roof. Operation of mechanical equipment would not increase ambient noise levels beyond the acceptable compatible land use noise levels and would not exceed the City's 65 dBA daytime standard or the City's 60 dBA nighttime standard. Therefore, the proposed Project would result in a less than significant impact related to stationary noise levels.

Truck and Loading Dock Noise

During loading and unloading activities, noise would be generated by the trucks' diesel engines, exhaust systems, and brakes during low gear shifting' braking activities; backing up toward the docks; dropping down the dock ramps; and maneuvering away from the docks. Loading or unloading activities would occur on the north, east, and west sides of the Project site. Driveways and access to the site would occur along 9th Street, Vineyard Avenue, and Baker Avenue. Typically, heavy truck operations generate a noise level of 68 dBA at a distance of 30 feet. The closest residences would be located approximately 150 feet north of the loading areas. Based on the inverse square law of sound propagation, the residences would experience truck noise levels of approximately 54 dBA, which is below the City's 65 dBA exterior residential noise standard and the City's 60 dBA exterior residential nighttime standard (per Municipal Code Section 17.66.110 & Table 17.66.110-1).

The proposed warehouse building includes dock-high doors for truck loading and unloading, as well as manufacturing and light industrial operations. The dock-high doors are set back 150 feet from the northern property line. Based on the truck reference noise level above, noise levels would attenuate to approximately 54 dBA at the property line. Therefore, noise levels associated with truck maneuvering and loading or unloading would not exceed the City's 65 dBA and 60 dBA exterior residential daytime and nighttime noise standards. It should be noted that these noise levels conservatively do not account for additional attenuation that would occur from intervening structures or perimeter walls. As described above, noise levels associated with trucks and loading or unloading activities would not exceed the City's standards and impacts would be less than significant.

Parking Noise

The proposed Project would accommodate the need for parking. Traffic associated with parking lots is typically not of sufficient volume to exceed community noise standards, which are based on a time-averaged scale such as the CNEL scale. The instantaneous maximum sound levels generated by a car door slamming, engine starting up, and car pass-bys range from 60 to 63 dBA and may be an annoyance to

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

[14] Sound level reduces by 6 dB for every doubling of distance.

adjacent noise-sensitive receptors. Conversations in parking areas may also be an annoyance to adjacent sensitive receptors. Sound levels of speech typically range from 33 dBA at 50 feet for normal speech to 50 dBA at 50 feet for very loud speech. It should be noted that parking lot noises are instantaneous noise levels compared to noise standards in the hourly L_{eq} metric, which are averaged over the entire duration of a time period.

Actual noise levels over time resulting from parking lot activities would be far lower than the reference levels identified above. Parking lot noise would occur within the surface parking lot on-site. It is also noted that parking lot noise occurs at the adjacent properties under existing conditions. Parking lot noise would be consistent with the existing noise in the vicinity and would be partially masked by background noise from traffic along Baker Avenue, 9th Street, and Vineyard Avenue. Noise associated with parking lot activities is not anticipated to exceed the City's noise standards during operation. Therefore, noise impacts from parking lots would be less than significant.

Off-Site Traffic Noise

Future development generated by the proposed project would result in additional traffic on adjacent roadways, thereby increasing vehicular noise near existing and proposed land uses. Based on the Traffic Impact Analysis, the proposed project would result in approximately 1,805 daily trips including 369 trucks (20.4 percent)The Opening Year "2021 Without Project" and "2021 Plus Project" scenarios were also compared. As shown in Table 12: Opening Year Traffic Noise Levels, roadway noise levels would range from 61.5 dBA to 71.4 under 2021 Without Project conditions and from 61.6 dBA to 71.8 dBA under 2021 Plus Project conditions. The highest noise levels would occur along Vineyard Avenue. It is noted that the fleet mix for the 2021 Plus Project scenario was modified to account for the truck trips generated by the project. As shown in Table 12, project generated traffic would result in a maximum increase of 0.9 dBA. As the noise level increase is below 3.0 dBA, a less than significant impact would occur in this regard.

Table 12: Opening Year Traffic Noise Levels

Roadway Segment	2021 Without Project		2021 With Project		Change	Significant Impacts
	ADT	dBA CNEL at 100 feet from Roadway Centerline	ADT	dBA CNEL at 100 feet from Roadway Centerline		
Vineyard Avenue, Foothill Blvd. to Arrow Route	13,243	69.6	13,315	70.1	0.5	No
Vineyard Avenue, Arrow Route to 9th St.	12,310	69.3	12,442	69.9	0.6	No
Vineyard Avenue, 9th St. to 8th St.	13,254	69.6	14,490	70.2	0.6	No
Vineyard Avenue, 8th St. to 6th St.	13,737	69.8	15,577	70.4	0.6	No
Vineyard Avenue, 6th St. to 4th St.	15,039	70.2	16,807	70.7	0.5	No
Vineyard Avenue, 4th St. to Jay St.	16,746	70.8	18,326	71.3	0.5	No
Vineyard Avenue, Jay St. to Inland Empire Blvd.	18,233	71.2	19,813	71.6	0.4	No
Vineyard Avenue, Empire Blvd. to I-10 WB ramps	19,076	71.4	20,656	71.8	0.4	No
Vineyard Avenue, I-10 WB ramps to I-10 EB ramps	17,422	71.0	18,248	71.4	0.4	No
Baker Avenue, Arrow Route to 9th St.	2,936	61.5	3,092	61.6	0.1	No
Baker Avenue, 9th St. to 8th St.	3,473	62.3	4,323	62.4	0.1	No
Arrow Route, Vineyard Ave. to Baker Ave.	8,633	67.8	8,733	67.8	0	No
9th Street, Vineyard Ave. to Baker Ave.	3,026	62.4	3,518	63.1	0.7	No
8th Street, Vineyard Ave. to Baker Ave.	3,710	64.0	4,476	64.8	0.9	No

Notes:
ADT = average daily trips; dBA = A-weighted decibels; CNEL = community noise equivalent level; EB = eastbound; WB = westbound.
Source: Based on traffic data within the *Traffic Impact Study*, prepared by Kimley-Horn, 2019. Refer to Appendix B for traffic noise modeling assumptions and results.

The Horizon Year "2040 Without Project" and "2040 Plus Project" scenarios were also compared. As shown in Table 13: Horizon Year Traffic Noise Levels, roadway noise levels would range from 62.3 dBA to 73.5 under 2040 Without Project conditions and from 62.3 dBA to 73.7 dBA under 2040 Plus Project conditions. The highest noise levels would occur along Vineyard Avenue. It is noted that the fleet mix for the 2040 Plus Project scenario was modified to account for the truck trips generated by the project. As shown in Table 13, project generated traffic would result in a maximum increase of 0.6 dBA. As the noise level increase is below 3.0 dBA, a less than significant impact would occur in this regard.

Table 13: Horizon Year Traffic Noise Levels

Roadway Segment	2040 Without Project		2040 With Project		Change	Significant Impacts
	ADT	dBA CNEL at 100 feet from Roadway Centerline	ADT	dBA CNEL at 100 feet from Roadway Centerline		
Vineyard Avenue, Foothill Blvd. to Arrow Route	17,863	70.9	17,935	71.3	0.4	No
Vineyard Avenue, Arrow Route to 9th St.	16,462	70.6	16,594	71.0	0.4	No
Vineyard Avenue, 9th St. to 8th St.	16,731	70.6	17,967	71.1	0.5	No
Vineyard Avenue, 8th St. to 6th St.	13,675	69.8	15,515	70.4	0.6	No
Vineyard Avenue, 6th St. to 4th St.	18,572	71.1	20,340	71.5	0.4	No
Vineyard Avenue, 4th St. to Jay St.	27,441	73.0	29,021	73.3	0.3	No
Vineyard Avenue, Jay St. to Inland Empire Blvd.	30,431	73.4	32,011	73.7	0.3	No
Vineyard Avenue, Empire Blvd. to I-10 WB ramps	30,831	73.5	32,411	73.7	0.3	No
Vineyard Avenue, I-10 WB ramps to I-10 EB ramps	27,177	72.9	28,003	73.2	0.3	No
Baker Avenue, Arrow Route to 9th St.	3,483	62.3	3,639	62.3	0	No
Baker Avenue, 9th St. to 8th St.	3,996	62.9	4,846	63.0	0	No
Arrow Route, Vineyard Ave. to Baker Ave.	13,048	69.6	13,148	69.6	0	No
9th Street, Vineyard Ave. to Baker Ave.	4,656	64.3	5,148	64.7	0.4	No
8th Street, Vineyard Ave. to Baker Ave.	5,815	65.9	6,581	66.5	0.6	No

Notes:
ADT = average daily trips; dBA = A-weighted decibels; CNEL = community noise equivalent level; EB = eastbound; WB = westbound.
Source: Based on traffic data within the *Traffic Impact Study*, prepared by Kimley-Horn, 2019. Refer to Appendix B for traffic noise modeling assumptions and results.

Mitigation Measures:

NOI-1: Prior to Grading Permit issuance, the applicant shall demonstrate, to the satisfaction of the City of Rancho Cucamonga Director of Public Works or City Engineer that the Project complies with the following:

- Construction contracts specify that all construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers and other State required noise attenuation devices.
- A sign, legible at 50 feet shall be posted at the Project construction site. The sign(s) shall be reviewed and approved by the Building Official and City Planning Department, prior to posting and shall indicate the dates and duration of construction activities, as well as provide a contact name and a telephone number where residents can inquire about the construction process and register complaints.
- Prior to issuance of any Grading or Building Permit, the Contractor shall provide evidence that a construction staff member will be designated as a Noise Disturbance Coordinator and will be present on-site during construction activities. The Noise

Disturbance Coordinator is responsible for responding to local complaints about construction noise. When a complaint is received, the Noise Disturbance Coordinator shall notify the City within 24-hours of the complaint, determine the cause (e.g., starting too early, bad muffler, etc.), and implement reasonable measures to resolve the complaint as deemed acceptable by the Public Works Department.

- Prior to issuance of any Grading or Building Permit, the Project Applicant shall demonstrate to the satisfaction of the City Engineer that construction noise reduction methods shall be used where feasible. These reduction methods include shutting off idling equipment, installing temporary acoustic barriers around stationary construction noise sources, maximizing the distance between construction equipment staging areas and occupied residential areas, and electric air compressors and similar power tools.
- Construction haul routes shall be designed to avoid noise-sensitive uses (e.g., residences, convalescent homes, etc.) to the extent feasible.
- During construction, stationary construction equipment shall be placed such that emitted noise is directed away from sensitive noise receivers.

NOI-2: Construction or grading noise levels shall not exceed the standards specified in City of Rancho Cucamonga Municipal Code Section 17.66.050, as measured at the adjacent property line. During construction, the applicant shall perform weekly noise level monitoring at the following locations adjacent to existing residential properties: (1) Baker Avenue frontage, (2) the north property line between Baker Avenue and the existing Lanyard Court industrial building development, and (3) the north property line along 9th Street opposite the existing Woodside Townhomes residential development. The findings of the noise monitoring shall be reported to the Building Official and City Planning Department on a monthly basis; however, the Building Official and City Planning Department must be notified immediately if noise levels at the aforementioned locations exceed 65 dBA at residential uses or 70 dBA at commercial or industrial land uses per the City of Rancho Cucamonga Municipal Code Section 17.66.050. If noise levels at the aforementioned locations exceed 65 dBA at the adjacent residential property line or 70 at the adjacent industrial property line, construction activities shall be halted, reduced in intensity to a level of compliance, or temporary construction noise barriers shall be used to the satisfaction of the City of Rancho Cucamonga.

If temporary construction noise barriers are required, they shall comply with the following criteria or as otherwise approved by the Building Official and City Planning Department:

- Temporary construction noise barriers shall be installed, maintained, and removed by the construction contractor along the property line such that they block the line of sight between the construction equipment and the adjacent uses.
- The temporary noise barriers shall be a minimum height of 12 feet high.
- The barriers shall be solid from the ground to the top of the barrier.
- The barriers shall have a weight of at least 2.5 pounds per square foot, which is equivalent to ¾ inch thick plywood.

Level of Significance: Less than significant with mitigation incorporated.

Threshold 6.2 Would the Project expose persons to or generate excessive ground borne vibration or ground borne noise levels?

Increases in groundborne vibration levels attributable to the proposed Project would be primarily associated with short-term construction-related activities. The Federal Transit Administration (FTA) has published standard vibration velocities for construction equipment operations in their 2018 *Transit Noise and Vibration Impact Assessment Manual*. The types of construction vibration impacts include human annoyance and building damage.

Building damage can be cosmetic or structural. Ordinary buildings that are not particularly fragile would not experience cosmetic damage (e.g. plaster cracks) at distances beyond 30 feet. This distance can vary substantially depending on soil composition and underground geological layer between vibration source and receiver. In addition, not all buildings respond similarly to vibration generated by construction equipment. For example, buildings constructed with reinforced concrete , steel, or timbers, the FTA guidelines show that a vibration level of up to 0.20 in/sec is considered safe and will not result in any vibration damage.

Table 14: Typical Construction Equipment Vibration Levels, lists vibration levels at 25 feet and 100 feet for typical construction equipment. Groundborne vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. As indicated in Table 14, based on FTA data, vibration velocities from typical heavy construction equipment operations that would be used during Project construction range from 0.003 to 0.089 in/sec PPV at 25 feet from the source of activity.

Table 14: Typical Construction Equipment Vibration Levels

Equipment	Peak Particle Velocity at 25 Feet (in/sec)	Peak Particle Velocity at 100 Feet (in/sec)[1]	Approximate VdB at 25 Feet	Approximate VdB at 100 Feet[2]
Large Bulldozer	0.089	0.011	87	69
Caisson Drilling	0.089	0.011	87	69
Loaded Trucks	0.076	0.010	86	68
Jackhammer	0.035	0.004	79	61
Small Bulldozer/Tractors	0.003	0.000	58	41

Notes:
1. Calculated using the following formula: $PPV_{equip}=PPV_{ref}x(25/D)^{1.5}$, where: PPV_{equip}=the peak particle velocity in in/sec of the equipment adjusted for the distance; PPV_{ref} = the reference vibration level in in/sec; D = the distance from the equipment to the receiver.
2. Calculated using the following formula: Lv(D)=Lv(25)-(30xlog10(D/25))

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

For this Project, FTA's 0.20 in/sec PPV threshold for non-engineered timber and masonry buildings was used because of the proximity of an existing historical house. Although vacant, the historical house located on site would act as a sensitive receptor for vibrations due to its age and construction methods. Based on site plans, construction activities would occur between 25 and 30 feet from the historical house. As shown in Table 14, at a distance of 25 feet, vibrations from construction equipment would reach a maximum of

0.089 in/sec PPV which is below FTA's threshold of 0.2 in/sec PPV. Therefore, vibration damage to existing buildings, especially the historical house, would not occur.

As shown in Table 14, construction VdB levels would not exceed 69 VdB at 100 feet (i.e. below the 75 VdB annoyance threshold). It can reasonably be assumed that at any further distance, the vibration levels would attenuate further. It is also acknowledged that construction activities would occur throughout the Project site and would not be concentrated at the point closest to the nearest residential structure. Therefore, vibration impacts associated with the Project construction would be less than significant.

Once operational, the Project would not be a significant source of groundborne vibration. Groundborne vibration surrounding the Project currently result from heavy-duty vehicular travel (e.g. refuse trucks, heavy duty trucks, delivery trucks, and transit buses) on the nearby local roadways. Operations of the proposed Project would include truck deliveries. Due to the rapid drop-off rate of ground-borne vibration and the short duration of the associated events, vehicular traffic-induced ground-borne vibration is rarely perceptible beyond the roadway right-of-way, and rarely results in vibration levels that cause damage to buildings in the vicinity. According to the FTA's Transit Noise and Vibration Impact Assessment, trucks rarely create vibration levels that exceed 70 VdB (equivalent to 0.012 in/sec PPV) when they are on roadways. In addition, the historical house would either be restored as part of the Project or donated to the City for future restoration to ensure that it would be preserved and is in compliance with all current building codes. Operations at the Project site or along surrounding roadways would not exceed FTA thresholds for building damage or annoyance. Therefore, impacts would be less than significant.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

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

The closest airport to the Project site is the Ontario International Airport located approximately 2.3 miles to the south. The Project is not within 2.0 miles of a public airport or within an airport land use plan. As identified in the LA/Ontario International Airport Land Use Compatibility Plan (ONT ALUCP) adopted in 2011, the entire Project area is within the Airport Influence Area (AIA). The northern portion of the Project site is within the FAA Obstruction Surfaces Area, which, per Federal Aviation Regulations Part 77 (FAR Part 77), Subpart B, requires that the FAA be notified of any proposed construction or alteration having a height greater than an imaginary surface extending 100 feet outward and 1 foot upward (slope of 100 to 1) for a distance of 20,000 feet from nearest point of any runway. The southern portion of the Project site is within FAA Height Notification Area, which, per FAR Part 77, Subpart C, establishes standards for determining obstructions to air navigation. According to the Plan, the 60 decibel (db) Community Noise Equivalent Level (CNEL) contour developed from forecasts of future operations in 2030 would not lie within the City of Rancho Cucamonga (Ontario 2011) and therefore the City of Rancho Cucamonga is not affected for noise. There is an occasional light plane and helicopter noise heard at the Project site, but neither the magnitude nor the duration of the aircraft noise is excessive. Thus, regarding Noise, there would be no impact to employees due to the distance from the airport.

Additionally, there are no private airstrips located within the Project vicinity. The Project would not expose people residing or working in the Project area to excessive airport- or airstrip-related noise levels. Therefore, impacts would be less than significant.

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

6.2 Cumulative Noise Impacts

Cumulative Construction Noise

As discussed above, the Project's construction activities would not exceed the City's noise standards. The City permits construction activities between the hours of 7:00 a.m. and 8:00 p.m. on weekdays and Saturdays and prohibits construction activities on Sundays and Federal holidays. There would be periodic, temporary, noise impacts that would cease upon completion of construction activities. The Project would contribute to other proximate construction Project noise impacts if construction activities were conducted concurrently. Based on the noise analysis above, the Project's would implement Mitigation Measures NOI-1 and NOI-2. Mitigation Measure NOI-1 would ensure that all construction equipment is equipped with properly operating and maintained mufflers, signs be posted near residences with contact information and dates of construction activities, and a noise disturbance coordinator to minimize and manage construction noise. Mitigation Measure NOI-2 requires noise monitoring to ensure construction noise levels comply with City standards or the use of temporary construction barriers. Temporary barriers would substantially reduce noise, ensuring that construction-generated noise levels would remain below the City's standards.

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

Cumulative Operational Noise

Cumulative Off-Site Traffic Noise

Cumulative noise impacts describe how much noise levels are projected to increase over existing conditions with the development of the Project and other foreseeable projects. Cumulative noise impacts would occur primarily as a result of increased traffic on local roadways due to buildout of the Project and other projects in the vicinity. Cumulative increases in traffic noise levels were estimated by comparing the Existing and Future Without Project scenarios to the Future Plus Project scenario. The traffic analysis considers cumulative traffic from future growth assumed in the transportation model, as well as cumulative projects.

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

- *Combined Effect*. The cumulative with Project noise level ("Cumulative With Project") would cause a significant cumulative impact if a 3.0 dB increase over "Existing" conditions occurs and the resulting noise level exceeds the applicable exterior standard at a sensitive use. Although there may be a significant noise increase due to the Project in combination with other related projects (combined effects), it must also be demonstrated that the Project has an incremental effect. In other words, a significant portion of the noise increase must be due to the Project.
- *Incremental Effects*. The "Cumulative With Project" causes a 1.0 dBA increase in noise over the "Cumulative Without Project" noise level.

A significant impact would result only if both the combined and incremental effects criteria have been exceeded. Noise by definition is a localized phenomenon and reduces as distance from the source increases. Consequently, only the Project and growth due to occur in the general area would contribute to cumulative noise impacts. Table 15: Cumulative Plus Project Conditions Predicted Traffic Noise Levels, identifies the traffic noise effects along roadway segments in the Project vicinity for "Existing," "Cumulative Without Project," and "Cumulative With Project," conditions, including incremental and net cumulative impacts.

Table 15 shows the increase for combined effects and incremental effects. However, as mentioned above, none of the segments meet the criteria for cumulative noise increase. The Project would not result in long-term mobile noise impacts based on project-generated traffic as well as cumulative and incremental noise levels. Therefore, the Project, in combination with cumulative background traffic noise levels, would result in a less than significant cumulative impact. The Project's contribution to would not be cumulatively considerable.

Table 15: Cumulative Plus Project Conditions Predicted Traffic Noise Levels

Roadway Segment	Existing	Cumulative Without Project	Cumulative With Project	Combined Effects Difference In dBA Between Existing and Cumulative With Project	Incremental Effects Difference In dBA Between Cumulative Without Project and Cumulative With Project	Cumulatively Significant Impact?
Vineyard Ave						
Foothill Blvd to Arrow Route	69.4	70.9	71.3	1.9	0.4	No
Arrow Route to 9th Street	69.1	70.6	71.0	1.9	0.4	No
9th Street to 8th Street	69.4	70.6	71.1	1.8	0.5	No
8th Street to 6th Street	69.4	69.8	70.4	1.0	0.6	No
6th St Street to 4th Street	69.7	71.1	71.5	1.8	0.4	No
4th Street to Jay Street	70.4	73.0	73.3	2.9	0.3	No
Jay Street to Inland Empire Blvd.	70.8	73.4	73.7	2.9	0.3	No
Empire Blvd. to I-10 WB ramps	71.0	73.5	73.7	2.7	0.3	No
I-10 WB ramps to I-10 EB ramps	70.7	72.9	73.2	2.5	0.3	No

Table 15: Cumulative Plus Project Conditions Predicted Traffic Noise Levels

Roadway Segment	Existing	Cumulative Without Project	Cumulative With Project	Combined Effects: Difference In dBA Between Existing and Cumulative With Project	Incremental Effects: Difference In dBA Between Cumulative Without Project and Cumulative With Project	Cumulatively Significant Impact?
Baker Avenue						
Arrow Route to 9th Street	61.0	62.3	62.3	1.3	0.0	No
9th Street to 8th Street	61.8	62.9	63.0	1.2	0.1	No
Arrow Route						
Vineyard Avenue to Baker Avenue	67.7	69.6	69.6	1.9	0.0	No
9th Street						
Vineyard Avenue to Baker Avenue	61.5	64.3	64.7	3.2	0.4	No
8th Street						
Vineyard Avenue to Baker Avenue	63.9	65.9	66.5	2.6	0.6	No

ADT = average daily trips; dBA = A-weighted decibels; CNEL = Community Noise Equivalent Level; WB = westbound; EB = eastbound

1. Traffic noise levels are at 100 feet from the roadway centerline. The actual sound level at any receptor location is dependent upon such factors as the source-to-receptor distance and the presence of intervening structures, barriers, and topography.

Source: Based on traffic data within the *VMT Assessment & Local Access, Safety, and Circulation Study*, prepared by Kimley-Horn, 2020. Refer to **Appendix A** for traffic noise modeling assumptions and results.

Cumulative Stationary Noise

Stationary noise sources of the Project would result in an incremental increase in non-transportation noise sources in the Project vicinity. However, as discussed above, operational noise caused by the Project would be less than significant. Additionally, due to site distance to sensitive receptors cumulative stationary noise impacts would not occur. Similar to the Project, other planned and approved projects would be required to mitigate for stationary noise impacts at nearby sensitive receptors, if necessary. As stationary noise sources are generally localized, there is a limited potential for other projects to contribute to cumulative noise impacts.

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

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

Mitigation Measures: No mitigation is required.

Level of Significance: Less than significant impact.

7 REFERENCES

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3. California Department of Transportation, *Traffic Noise Analysis Protocol*, 2011.
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5. California Department of Transportation, *Transportation and Construction Vibration Guidance Manual*, 2013.
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7. Federal Highway Administration, *Noise Fundamentals*, 2017. Available at: https://www.fhwa.dot.gov/environMent/noise/regulations_and_guidance/polguide/polguide02.cfm
8. Federal Highway Administration, *Roadway Construction Noise Model*, 2006.
9. Federal Highway Administration, *Roadway Construction Noise Model User's Guide Final Report*, 2006.
10. Federal Interagency Committee on Noise, *Federal Agency Review of Selected Airport Noise Analysis Issues*, 1992.
11. Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual*, 2018.
12. Harris, Cyril M., *Handbook of Noise Control*, 1979.
13. Kimley-Horn, *9th and Vineyard Warehouse Project Traffic Impact Study*, December 2019.
14. City of Rancho Cucamonga. (2021). PlanRC, Rancho Cucamonga General Plan Update. Rancho Cucamonga, CA: City of Rancho Cucamonga.
15. City of Rancho Cucamonga. (2021). Rancho Cucamonga General Plan Update EIR. Rancho Cucamonga, CA: City of Rancho Cucamonga.
16. City of Rancho Cucamonga, *Municipal Code*, 2019.
17. United States Environmental Protection Agency, *Protective Noise Levels (EPA 550/9-79-100)*, 1979.

Appendix A

Existing Ambient Noise Measurements

Noise Measurement Field Data

Project:	9th & Vineyard	**Job Number:**	194094002
Site No.:	1	**Date:**	8/8/2019
Analyst:	Josh Cortez	**Time:**	9:29 AM
Location:	East 9th Street, West of Woodside Townhomes entrance		
Noise Sources:	Vehicles traveling on East 9th Street		
Comments:			

Results (dBA):

	Leq:	Lmin:	Lmax:	Peak:
Measurement 1:	65.2	41.5	85.4	105.3

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

Weather	
Temp. (degrees F):	74°
Wind (mph):	< 5
Sky:	Clear
Bar. Pressure:	29.92"
Humidity:	69%

Photo:

Kimley»Horn

Summary

File Name on Meter	SB.003	
File Name on PC	SLM_0005586_SB_003.00.ldbin	
Serial Number	0005586	
Model	SoundExpert® LxT	
Firmware Version	2.302	
User	Joshua Cortez	
Location	Rancho Cucamonga	
Job Description	9th & Vineyard	
Note		

Measurement

Description		
Start	2019-08-08 09:29:18	
Stop	2019-08-08 09:39:18	
Duration	00:10:00.0	
Run Time	00:10:00.0	
Pause	00:00:00.0	
Pre Calibration	2019-07-30 10:17:56	
Post Calibration	None	
Calibration Deviation	---	

Overall Settings

RMS Weight	A Weighting	
Peak Weight	Z Weighting	
Detector	Slow	
Preamp	PRMLxT1L	
Microphone Correction	Off	
Integration Method	Linear	
OBA Range	Normal	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	Z Weighting	
OBA Max Spectrum	At LMax	
Overload	122.1 dB	
	A	**C**
Under Range Peak	78.3	75.3
Under Range Limit	**27.3**	26.0
Noise Floor	16.9	16.8

Results

LAeq	65.2 dB	
LAE	93.0 dB	
EA	222.798 µPa²h	
LZpeak (max)	2019-08-08 09:33:43	105.3
LASmax	2019-08-08 09:33:44	85.4
LASmin	2019-08-08 09:38:25	41.5

SEA	-99.9 dB	
LAS > 85.0 dB (Exceedance Counts / Duration)	1	1.3
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0
LZpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0
LZpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0
LZpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0
Community Noise	**Ldn**	**LDay 07:00-22:00**
	65.2	65.2
LCeq	69.4 dB	
LAeq	65.2 dB	
LCeq - LAeq	4.1 dB	
LAIeq	68.2 dB	
LAeq	65.2 dB	
LAIeq - LAeq	3.0 dB	

	A	
	dB	**Time Stamp**
Leq	65.2	
LS(max)	85.4	2019/08/08 9:33:44
LS(min)	41.5	2019/08/08 9:38:25
LPeak(max)		

# Overloads	0
Overload Duration	0.0 s
# OBA Overloads	0
OBA Overload Duration	0.0 s

Statistics	
LAS5.00	70.8 dB
LAS10.00	68.1 dB
LAS33.30	59.9 dB
LAS50.00	54.5 dB
LAS66.60	50.2 dB
LAS90.00	46.2 dB

Calibration History		
Preamp	**Date**	**dB re. 1V/Pa**
PRMLxT1L	2019-07-30 10:17:56	-28.3
PRMLxT1L	2019-07-24 10:18:41	-28.4
PRMLxT1L	2019-07-09 15:36:26	-28.3
PRMLxT1L	2019-06-10 15:25:58	-28.3
PRMLxT1L	2019-05-01 10:09:52	-28.5
PRMLxT1L	2019-04-10 09:39:53	-28.7
PRMLxT1L	2019-04-10 09:39:38	-28.7
PRMLxT1L	2019-04-10 09:39:18	-28.8
PRMLxT1L	2019-04-10 09:38:57	-28.8

Noise Measurement Field Data

Project:	9th & Vineyard	**Job Number:**	194094002
Site No.:	2	**Date:**	8/8/2019
Analyst:	Josh Cortez	**Time:**	9:50 AM
Location:	On parkway of 8558 East 9th Street, behind mailboxes		
Noise Sources:	Vehicles traveling on East 9th Street		
Comments:			

Results (dBA):

	Leq:	Lmin:	Lmax:	Peak:
Measurement 1:	62.6	39.4	77.5	99.5

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

Weather	
Temp. (degrees F):	75°
Wind (mph):	< 5
Sky:	Clear
Bar. Pressure:	29.91"
Humidity:	64%

Photo:

Kimley»Horn

Summary		
File Name on Meter	SB.004	
File Name on PC	SLM_0005586_SB_004.00.ldbin	
Serial Number	0005586	
Model	SoundExpert® LxT	
Firmware Version	2.302	
User	Joshua Cortez	
Location	Rancho Cucamonga	
Job Description	9th & Vineyard	
Note		

Measurement		
Description		
Start	2019-08-08 09:50:21	
Stop	2019-08-08 10:00:21	
Duration	00:10:00.0	
Run Time	00:10:00.0	
Pause	00:00:00.0	
Pre Calibration	2019-07-30 10:17:56	
Post Calibration	None	
Calibration Deviation	---	

Overall Settings		
RMS Weight	A Weighting	
Peak Weight	Z Weighting	
Detector	Slow	
Preamp	PRMLxT1L	
Microphone Correction	Off	
Integration Method	Linear	
OBA Range	Normal	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	Z Weighting	
OBA Max Spectrum	At LMax	
Overload	122.1 dB	
	A	**C**
Under Range Peak	78.3	75.3
Under Range Limit	**27.3**	26.0
Noise Floor	16.9	16.8

Results		
LA_{eq}	62.6 dB	
LAE	90.4 dB	
EA	122.626 µPa²h	
$LZ_{peak\ (max)}$	2019-08-08 09:53:45	99.5
LAS_{max}	2019-08-08 09:53:45	77.5
LAS_{min}	2019-08-08 09:57:21	39.4

SEA	-99.9 dB	
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0
LZpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0
LZpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0
LZpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0

Community Noise	**Ldn**	**LDay 07:00-22:00**
	62.6	62.6

LCeq	70.0 dB
LAeq	62.6 dB
LCeq - LAeq	7.3 dB
LAIeq	64.2 dB
LAeq	62.6 dB
LAIeq - LAeq	1.6 dB

	A	
	dB	**Time Stamp**
Leq	62.6	
LS(max)	77.5	2019/08/08 9:53:45
LS(min)	39.4	2019/08/08 9:57:21
LPeak(max)		

# Overloads	0
Overload Duration	0.0 s
# OBA Overloads	0
OBA Overload Duration	0.0 s

Statistics

LAS5.00	68.9 dB
LAS10.00	67.1 dB
LAS33.30	59.8 dB
LAS50.00	52.0 dB
LAS66.60	47.2 dB
LAS90.00	42.4 dB

Calibration History

Preamp	**Date**	**dB re. 1V/Pa**
PRMLxT1L	2019-07-30 10:17:56	-28.3
PRMLxT1L	2019-07-24 10:18:41	-28.4
PRMLxT1L	2019-07-09 15:36:26	-28.3
PRMLxT1L	2019-06-10 15:25:58	-28.3
PRMLxT1L	2019-05-01 10:09:52	-28.5
PRMLxT1L	2019-04-10 09:39:53	-28.7
PRMLxT1L	2019-04-10 09:39:38	-28.7
PRMLxT1L	2019-04-10 09:39:18	-28.8
PRMLxT1L	2019-04-10 09:38:57	-28.8

Noise Measurement Field Data

Project:	9th & Vineyard	**Job Number:**	194094002
Site No.:	3	**Date:**	8/8/2019
Analyst:	Josh Cortez	**Time:**	10:04 AM
Location:	On sidewalk near railroad sign and utility boxes, across from vacant building		
Noise Sources:	Vehicles traveling on Baker Avenue		
Comments:			

Results (dBA):

	Leq:	Lmin:	Lmax:	Peak:
Measurement 1:	63.4	43.7	82.9	102.5

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

Weather	
Temp. (degrees F):	75°
Wind (mph):	< 5
Sky:	Clear
Bar. Pressure:	29.91"
Humidity:	64%

Photo:

Kimley»Horn

Summary

File Name on Meter	SB.005
File Name on PC	SLM_0005586_SB_005.00.ldbin
Serial Number	0005586
Model	SoundExpert® LxT
Firmware Version	2.302
User	Joshua Cortez
Location	Rancho Cucamonga
Job Description	9th & Vineyard
Note	

Measurement

Description	
Start	2019-08-08 10:04:45
Stop	2019-08-08 10:14:45
Duration	00:10:00.0
Run Time	00:10:00.0
Pause	00:00:00.0
Pre Calibration	2019-07-30 10:17:56
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting		
Peak Weight	Z Weighting		
Detector	Slow		
Preamp	PRMLxT1L		
Microphone Correction	Off		
Integration Method	Linear		
OBA Range	Normal		
OBA Bandwidth	1/1 and 1/3		
OBA Freq. Weighting	Z Weighting		
OBA Max Spectrum	At LMax		
Overload	122.1	dB	
	A		**C**
Under Range Peak	78.3		75.3
Under Range Limit	**27.3**		26.0
Noise Floor	16.9		16.8

Results

LA_{eq}	63.4	dB	
LAE	91.1	dB	
EA	144.724	µPa²h	
$LZ_{peak\ (max)}$	2019-08-08 10:07:13		102.5
LAS_{max}	2019-08-08 10:07:13		82.9
LAS_{min}	2019-08-08 10:13:32		43.7

SEA	-99.9 dB	
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0
LZpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0
LZpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0
LZpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0

Community Noise	**Ldn**	**LDay 07:00-22:00**
	63.4	63.4

LCeq	69.5 dB
LAeq	63.4 dB
LCeq - LAeq	6.2 dB
LAIeq	65.5 dB
LAeq	63.4 dB
LAIeq - LAeq	2.1 dB

	A	
	dB	**Time Stamp**
Leq	63.4	
LS(max)	82.9	2019/08/08 10:07:13
LS(min)	43.7	2019/08/08 10:13:32
LPeak(max)		

# Overloads	0
Overload Duration	0.0 s
# OBA Overloads	0
OBA Overload Duration	0.0 s

Statistics

LAS5.00	68.9 dB
LAS10.00	66.6 dB
LAS33.30	56.3 dB
LAS50.00	51.0 dB
LAS66.60	47.3 dB
LAS90.00	45.4 dB

Calibration History

Preamp	**Date**	**dB re. 1V/Pa**
PRMLxT1L	2019-07-30 10:17:56	-28.3
PRMLxT1L	2019-07-24 10:18:41	-28.4
PRMLxT1L	2019-07-09 15:36:26	-28.3
PRMLxT1L	2019-06-10 15:25:58	-28.3
PRMLxT1L	2019-05-01 10:09:52	-28.5
PRMLxT1L	2019-04-10 09:39:53	-28.7
PRMLxT1L	2019-04-10 09:39:38	-28.7
PRMLxT1L	2019-04-10 09:39:18	-28.8
PRMLxT1L	2019-04-10 09:38:57	-28.8

Noise Measurement Field Data

Project:	9th & Vineyard	**Job Number:**	194094002
Site No.:	4	**Date:**	8/8/2019
Analyst:	Josh Cortez	**Time:**	10:17 AM
Location:	In parkway next to mailbox of 1668 8th Street		
Noise Sources:	Vehicles traveling on 8th Street		
Comments:			

Results (dBA):

	Leq:	Lmin:	Lmax:	Peak:
Measurement 1:	63.4	41.8	77.7	100.5

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

Weather	
Temp. (degrees F):	75°
Wind (mph):	< 5
Sky:	Clear
Bar. Pressure:	29.91"
Humidity:	64%

Photo:

Kimley»Horn

Summary		
File Name on Meter	SB.006	
File Name on PC	SLM_0005586_SB_006.00.ldbin	
Serial Number	0005586	
Model	SoundExpert® LxT	
Firmware Version	2.302	
User	Joshua Cortez	
Location	Rancho Cucamonga	
Job Description	9th & Vineyard	
Note		

Measurement		
Description		
Start	2019-08-08 10:17:12	
Stop	2019-08-08 10:27:12	
Duration	00:10:00.0	
Run Time	00:10:00.0	
Pause	00:00:00.0	
Pre Calibration	2019-07-30 10:17:56	
Post Calibration	None	
Calibration Deviation	---	

Overall Settings		
RMS Weight	A Weighting	
Peak Weight	Z Weighting	
Detector	Slow	
Preamp	PRMLxT1L	
Microphone Correction	Off	
Integration Method	Linear	
OBA Range	Normal	
OBA Bandwidth	1/1 and 1/3	
OBA Freq. Weighting	Z Weighting	
OBA Max Spectrum	At LMax	
Overload	122.1 dB	
	A	**C**
Under Range Peak	78.3	75.3
Under Range Limit	**27.3**	26.0
Noise Floor	16.9	16.8

Results		
LAeq	64.3 dB	
LAE	92.1 dB	
EA	178.544 µPa²h	
LZpeak (max)	2019-08-08 10:23:04	100.5
LASmax	2019-08-08 10:23:05	77.7
LASmin	2019-08-08 10:20:41	41.8

SEA	-99.9 dB	
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0
LZpeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0
LZpeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0
LZpeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0

Community Noise	**Ldn**	**LDay 07:00-22:00**
	64.3	64.3

LCeq	71.5 dB
LAeq	64.3 dB
LCeq - LAeq	7.3 dB
LAIeq	66.2 dB
LAeq	64.3 dB
LAIeq - LAeq	2.0 dB

	A	
	dB	**Time Stamp**
Leq	64.3	
LS(max)	77.7	2019/08/08 10:23:05
LS(min)	41.8	2019/08/08 10:20:41
LPeak(max)		

# Overloads	0
Overload Duration	0.0 s
# OBA Overloads	0
OBA Overload Duration	0.0 s

Statistics

LAS5.00	71.0 dB
LAS10.00	69.5 dB
LAS33.30	61.9 dB
LAS50.00	56.3 dB
LAS66.60	50.9 dB
LAS90.00	44.7 dB

Calibration History

Preamp	**Date**	**dB re. 1V/Pa**
PRMLxT1L	2019-07-30 10:17:56	-28.3
PRMLxT1L	2019-07-24 10:18:41	-28.4
PRMLxT1L	2019-07-09 15:36:26	-28.3
PRMLxT1L	2019-06-10 15:25:58	-28.3
PRMLxT1L	2019-05-01 10:09:52	-28.5
PRMLxT1L	2019-04-10 09:39:53	-28.7
PRMLxT1L	2019-04-10 09:39:38	-28.7
PRMLxT1L	2019-04-10 09:39:18	-28.8
PRMLxT1L	2019-04-10 09:38:57	-28.8

Appendix B

Noise Modeling Results

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

Project Name: 9th and Vineyard
Project Number: 95894015
Scenario: Existing
Ldn/CNEL: CNEL

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

								Vehicle Mix			Distance from Centerline of Roadway			
				Median	ADT	Speed	Alpha	Medium	Heavy	CNEL at	Distance to Contour			
#	Roadway	Segment	Lanes	Width	Volume	(mph)	Factor	Trucks	Trucks	100 Feet	70 CNEL	65 CNEL	60 CNEL	55 CNEL
1	Vineyard Ave	Foothill Blvd to Arrow Route	4	10	12,593	45	0	4.6%	12.3%	69.4	87	276	873	2,760
2	Vineyard Ave	Arrow Route to 9th St	4	10	11,678	45	0	4.6%	12.3%	69.1	81	256	809	2,559
3	Vineyard Ave	9th St to 8th St	4	10	12,441	45	0	4.6%	12.3%	69.4	86	273	862	2,726
4	Vineyard Ave	8th St to 6th St	4	10	12,530	45	0	4.6%	12.3%	69.4	87	275	868	2,746
5	Vineyard Ave	6th St to 4th St	4	10	13,587	45	0	4.6%	12.3%	69.7	94	298	942	2,977
6	Vineyard Ave	4th St to Jay St	6	10	15,216	45	0	4.6%	12.3%	70.4	110	346	1,095	3,464
7	Vineyard Ave	Jay Street to Inland Empire Blvd	6	10	16,674	45	0	4.6%	12.3%	70.8	120	380	1,200	3,796
8	Vineyard Ave	Empire Blvd to I-10 westbound ramps	6	10	17,500	45	0	4.6%	12.3%	71.0	126	398	1,260	3,984
9	Vineyard Ave	I-10 westbound ramps to I-10 eastboun	6	10	16,479	45	0	4.6%	12.3%	70.7	119	375	1,186	3,752
10	Baker Avenue	Arrow Route to 9th St	2	0	2,600	35	0	4.6%	12.3%	61.0	-	40	126	400
11	Baker Avenue	9th St to 8th St	2	0	3,126	35	0	4.6%	12.3%	61.8	-	48	152	481
12	Arrow Route	Vineyard Ave to Baker Ave	4	10	8,444	45	0	4.6%	12.3%	67.7	59	185	585	1,850
13	9th Street	Vineyard Ave to Baker Ave	2	0	2,459	40	0	4.6%	12.3%	61.5	-	45	142	449
14	8th Street	Vineyard Ave to Baker Ave	2	0	3,618	45	0	4.6%	12.3%	63.9	-	77	244	773

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

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

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

Project Name: 9th and Vineyard
Project Number: 95894015
Scenario: Opening Year
Ldn/CNEL: CNEL

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

								Vehicle Mix			Distance from Centerline of Roadway			
				Median	ADT	Speed	Alpha	Medium	Heavy	CNEL at	Distance to Contour			
#	Roadway	Segment	Lanes	Width	Volume	(mph)	Factor	Trucks	Trucks	100 Feet	70 CNEL	65 CNEL	60 CNEL	55 CNEL
1	Vineyard Ave	Foothill Blvd to Arrow Route	4	10	13,243	45	0	4.6%	12.3%	69.6	92	290	918	2,902
2	Vineyard Ave	Arrow Route to 9th St	4	10	12,310	45	0	4.6%	12.3%	69.3	85	270	853	2,698
3	Vineyard Ave	9th St to 8th St	4	10	13,254	45	0	4.6%	12.3%	69.6	92	290	918	2,904
4	Vineyard Ave	8th St to 6th St	4	10	13,737	45	0	4.6%	12.3%	69.8	95	301	952	3,010
5	Vineyard Ave	6th St to 4th St	4	10	15,039	45	0	4.6%	12.3%	70.2	104	330	1,042	3,296
6	Vineyard Ave	4th St to Jay St	6	10	16,746	45	0	4.6%	12.3%	70.8	121	381	1,206	3,813
7	Vineyard Ave	Jay Street to Inland Empire Blvd	6	10	18,233	45	0	4.6%	12.3%	71.2	131	415	1,313	4,151
8	Vineyard Ave	Empire Blvd to I-10 westbound ramps	6	10	19,076	45	0	4.6%	12.3%	71.4	137	434	1,373	4,343
9	Vineyard Ave	I-10 westbound ramps to I-10 eastboun	6	10	17,422	45	0	4.6%	12.3%	71.0	125	397	1,254	3,966
10	Baker Avenue	Arrow Route to 9th St	2	0	2,936	35	0	4.6%	12.3%	61.5	-	45	143	452
11	Baker Avenue	9th St to 8th St	2	0	3,473	35	0	4.6%	12.3%	62.3	-	53	169	534
12	Arrow Route	Vineyard Ave to Baker Ave	4	10	8,633	45	0	4.6%	12.3%	67.8	60	189	598	1,892
13	9th Street	Vineyard Ave to Baker Ave	2	0	3,026	40	0	4.6%	12.3%	62.4	-	55	175	552
14	8th Street	Vineyard Ave to Baker Ave	2	0	3,710	45	0	4.6%	12.3%	64.0	-	79	251	793

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

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

Project Name: 9th and Vineyard
Project Number: 95894015
Scenario: Opening Year Plus Project
Ldn/CNEL: CNEL

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

								Vehicle Mix			Distance from Centerline of Roadway			
				Median	ADT	Speed	Alpha	Medium	Heavy	CNEL at	Distance to Contour			
#	Roadway	Segment	Lanes	Width	Volume	(mph)	Factor	Trucks	Trucks	100 Feet	70 CNEL	65 CNEL	60 CNEL	55 CNEL
1	Vineyard Ave	Foothill Blvd to Arrow Route	4	10	13,315	45	0	5.7%	13.9%	70.1	103	327	1,034	3,270
2	Vineyard Ave	Arrow Route to 9th St	4	10	12,442	45	0	5.8%	14.0%	69.9	97	307	970	3,068
3	Vineyard Ave	9th St to 8th St	4	10	14,490	45	0	5.3%	12.8%	70.2	105	332	1,050	3,320
4	Vineyard Ave	8th St to 6th St	4	10	15,577	45	0	5.0%	12.3%	70.4	109	345	1,091	3,450
5	Vineyard Ave	6th St to 4th St	4	10	16,807	45	0	5.0%	12.4%	70.7	118	373	1,180	3,732
6	Vineyard Ave	4th St to Jay St	6	10	18,326	45	0	5.0%	12.5%	71.3	135	426	1,347	4,258
7	Vineyard Ave	Jay Street to Inland Empire Blvd	6	10	19,813	45	0	5.0%	12.5%	71.6	145	460	1,454	4,597
8	Vineyard Ave	Empire Blvd to I-10 westbound ramps	6	10	20,656	45	0	5.0%	12.5%	71.8	151	479	1,514	4,789
9	Vineyard Ave	I-10 westbound ramps to I-10 eastboun	6	10	18,248	45	0	5.2%	13.0%	71.4	139	438	1,385	4,381
10	Baker Avenue	Arrow Route to 9th St	2	0	3,092	35	0	4.4%	11.7%	61.6	-	45	144	455
11	Baker Avenue	9th St to 8th St	2	0	4,323	35	0	3.7%	9.9%	62.4	-	55	174	551
12	Arrow Route	Vineyard Ave to Baker Ave	4	10	8,733	45	0	4.6%	12.2%	67.8	60	190	600	1,896
13	9th Street	Vineyard Ave to Baker Ave	2	0	3,518	40	0	5.0%	12.2%	63.1	-	64	204	644
14	8th Street	Vineyard Ave to Baker Ave	2	0	4,476	45	0	5.2%	12.2%	64.8	-	97	305	965

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

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

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

Project Name: 9th and Vineyard
Project Number: 95894015
Scenario: Horizon Year
Ldn/CNEL: CNEL

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

								Vehicle Mix			Distance from Centerline of Roadway			
				Median	ADT	Speed	Alpha	Medium	Heavy	CNEL at	Distance to Contour			
#	Roadway	Segment	Lanes	Width	Volume	(mph)	Factor	Trucks	Trucks	100 Feet	70 CNEL	65 CNEL	60 CNEL	55 CNEL
1	Vineyard Ave	Foothill Blvd to Arrow Route	4	10	17,863	45	0	4.6%	12.3%	70.9	124	391	1,238	3,914
2	Vineyard Ave	Arrow Route to 9th St	4	10	16,462	45	0	4.6%	12.3%	70.6	114	361	1,141	3,607
3	Vineyard Ave	9th St to 8th St	4	10	16,731	45	0	4.6%	12.3%	70.6	116	367	1,159	3,666
4	Vineyard Ave	8th St to 6th St	4	10	13,675	45	0	4.6%	12.3%	69.8	95	300	948	2,997
5	Vineyard Ave	6th St to 4th St	4	10	18,572	45	0	4.6%	12.3%	71.1	129	407	1,287	4,070
6	Vineyard Ave	4th St to Jay St	6	10	27,441	45	0	4.6%	12.3%	73.0	198	625	1,976	6,248
7	Vineyard Ave	Jay Street to Inland Empire Blvd	6	10	30,431	45	0	4.6%	12.3%	73.4	219	693	2,191	6,928
8	Vineyard Ave	Empire Blvd to I-10 westbound ramps	6	10	30,831	45	0	4.6%	12.3%	73.5	222	702	2,220	7,019
9	Vineyard Ave	I-10 westbound ramps to I-10 eastboun	6	10	27,177	45	0	4.6%	12.3%	72.9	196	619	1,957	6,187
10	Baker Avenue	Arrow Route to 9th St	2	0	3,483	35	0	4.6%	12.3%	62.3	-	54	169	536
11	Baker Avenue	9th St to 8th St	2	0	3,996	35	0	4.6%	12.3%	62.9	-	61	194	615
12	Arrow Route	Vineyard Ave to Baker Ave	4	10	13,048	45	0	4.6%	12.3%	69.6	90	286	904	2,859
13	9th Street	Vineyard Ave to Baker Ave	2	0	4,656	40	0	4.6%	12.3%	64.3	-	85	269	849
14	8th Street	Vineyard Ave to Baker Ave	2	0	5,815	45	0	4.6%	12.3%	65.9	39	124	393	1,242

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

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

Project Name:	9th and Vineyard
Project Number:	95894015
Scenario:	Horizon Year Plus Project
Ldn/CNEL:	CNEL

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

								Vehicle Mix			Distance from Centerline of Roadway			
				Median	ADT	Speed	Alpha	Medium	Heavy	CNEL at	Distance to Contour			
#	Roadway	Segment	Lanes	Width	Volume	(mph)	Factor	Trucks	Trucks	100 Feet	70 CNEL	65 CNEL	60 CNEL	55 CNEL
1	Vineyard Ave	Foothill Blvd to Arrow Route	4	10	17,935	45	0	5.4%	13.5%	71.3	135	428	1,354	4,283
2	Vineyard Ave	Arrow Route to 9th St	4	10	16,594	45	0	5.5%	13.6%	71.0	126	398	1,258	3,978
3	Vineyard Ave	9th St to 8th St	4	10	17,967	45	0	5.1%	12.7%	71.1	129	408	1,291	4,082
4	Vineyard Ave	8th St to 6th St	4	10	15,515	45	0	5.0%	12.3%	70.4	109	344	1,087	3,436
5	Vineyard Ave	6th St to 4th St	4	10	20,340	45	0	5.0%	12.3%	71.5	143	451	1,425	4,507
6	Vineyard Ave	4th St to Jay St	6	10	29,021	45	0	4.9%	12.4%	73.3	212	669	2,117	6,693
7	Vineyard Ave	Jay Street to Inland Empire Blvd	6	10	32,011	45	0	4.9%	12.4%	73.7	233	737	2,332	7,374
8	Vineyard Ave	Empire Blvd to I-10 westbound ramps	6	10	32,411	45	0	4.9%	12.4%	73.7	236	747	2,361	7,465
9	Vineyard Ave	I-10 westbound ramps to I-10 eastboun	6	10	28,003	45	0	5.0%	12.8%	73.2	209	660	2,088	6,602
10	Baker Avenue	Arrow Route to 9th St	2	0	3,639	35	0	4.4%	11.8%	62.3	-	54	170	539
11	Baker Avenue	9th St to 8th St	2	0	4,846	35	0	3.8%	10.2%	63.0	-	63	200	631
12	Arrow Route	Vineyard Ave to Baker Ave	4	10	13,148	45	0	4.6%	12.2%	69.6	91	286	905	2,863
13	9th Street	Vineyard Ave to Baker Ave	2	0	5,148	40	0	4.9%	12.2%	64.7	-	94	298	941
14	8th Street	Vineyard Ave to Baker Ave	2	0	6,581	45	0	5.0%	12.2%	66.5	45	141	447	1,415

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

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

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 11/25/2019
Case Description: 1 Demolition

---- Receptor #1 ----

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

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	50	5
All Other Equipment > 5 HP	No	50	85		50	5
All Other Equipment > 5 HP	No	50	85		50	5
Excavator	No	40		80.7	50	5
Excavator	No	40		80.7	50	5
Excavator	No	40		80.7	50	5
Generator	No	50		80.6	50	5
Generator	No	50		80.6	50	5
Dozer	No	40		81.7	50	5
Dozer	No	40		81.7	50	5

Results

Equipment	Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq
Concrete Saw	84.6	77.6	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	80	77	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	80	77	N/A	N/A	N/A	N/A
Excavator	75.7	71.7	N/A	N/A	N/A	N/A
Excavator	75.7	71.7	N/A	N/A	N/A	N/A
Excavator	75.7	71.7	N/A	N/A	N/A	N/A
Generator	75.6	72.6	N/A	N/A	N/A	N/A
Generator	75.6	72.6	N/A	N/A	N/A	N/A
Dozer	76.7	72.7	N/A	N/A	N/A	N/A
Dozer	76.7	72.7	N/A	N/A	N/A	N/A
Total	84.6	84.4	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

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

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	80	5
All Other Equipment > 5 HP	No	50	85		80	5
All Other Equipment > 5 HP	No	50	85		80	5
Excavator	No	40		80.7	80	5
Excavator	No	40		80.7	80	5
Excavator	No	40		80.7	80	5
Generator	No	50		80.6	80	5
Generator	No	50		80.6	80	5
Dozer	No	40		81.7	80	5
Dozer	No	40		81.7	80	5

Results

	Calculated (dBA)		Noise Limits (dBA)			
			Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Saw	80.5	73.5	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	75.9	72.9	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	75.9	72.9	N/A	N/A	N/A	N/A
Excavator	71.6	67.6	N/A	N/A	N/A	N/A
Excavator	71.6	67.6	N/A	N/A	N/A	N/A
Excavator	71.6	67.6	N/A	N/A	N/A	N/A
Generator	71.5	68.5	N/A	N/A	N/A	N/A
Generator	71.5	68.5	N/A	N/A	N/A	N/A
Dozer	72.6	68.6	N/A	N/A	N/A	N/A
Dozer	72.6	68.6	N/A	N/A	N/A	N/A
Total	80.5	80.3	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

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

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	260	5
All Other Equipment > 5 HP	No	50	85		260	5
All Other Equipment > 5 HP	No	50	85		260	5
Excavator	No	40		80.7	260	5
Excavator	No	40		80.7	260	5
Excavator	No	40		80.7	260	5
Generator	No	50		80.6	260	5
Generator	No	50		80.6	260	5
Dozer	No	40		81.7	260	5
Dozer	No	40		81.7	260	5

Results

		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Saw		70.3	63.3	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		65.7	62.7	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		65.7	62.7	N/A	N/A	N/A	N/A
Excavator		61.4	57.4	N/A	N/A	N/A	N/A
Excavator		61.4	57.4	N/A	N/A	N/A	N/A
Excavator		61.4	57.4	N/A	N/A	N/A	N/A
Generator		61.3	58.3	N/A	N/A	N/A	N/A
Generator		61.3	58.3	N/A	N/A	N/A	N/A
Dozer		62.3	58.4	N/A	N/A	N/A	N/A
Dozer		62.3	58.4	N/A	N/A	N/A	N/A
	Total	70.3	70.1	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial North	Industrial	1	1	1

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	80	5
All Other Equipment > 5 HP	No	50	85		80	5
All Other Equipment > 5 HP	No	50	85		80	5
Excavator	No	40		80.7	80	5
Excavator	No	40		80.7	80	5
Excavator	No	40		80.7	80	5
Generator	No	50		80.6	80	5
Generator	No	50		80.6	80	5
Dozer	No	40		81.7	80	5
Dozer	No	40		81.7	80	5

Results

		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Saw		80.5	73.5	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		75.9	72.9	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		75.9	72.9	N/A	N/A	N/A	N/A
Excavator		71.6	67.6	N/A	N/A	N/A	N/A
Excavator		71.6	67.6	N/A	N/A	N/A	N/A
Excavator		71.6	67.6	N/A	N/A	N/A	N/A
Generator		71.5	68.5	N/A	N/A	N/A	N/A
Generator		71.5	68.5	N/A	N/A	N/A	N/A
Dozer		72.6	68.6	N/A	N/A	N/A	N/A
Dozer		72.6	68.6	N/A	N/A	N/A	N/A
	Total	80.5	80.3	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #5 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial South	Industrial	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	130	5
All Other Equipment > 5 HP	No	50	85		130	5
All Other Equipment > 5 HP	No	50	85		130	5
Excavator	No	40		80.7	130	5
Excavator	No	40		80.7	130	5
Excavator	No	40		80.7	130	5
Generator	No	50		80.6	130	5
Generator	No	50		80.6	130	5
Dozer	No	40		81.7	130	5
Dozer	No	40		81.7	130	5

Results

	Calculated (dBA)		Noise Limits (dBA)			
			Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Saw	76.3	69.3	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	71.7	68.7	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	71.7	68.7	N/A	N/A	N/A	N/A
Excavator	67.4	63.4	N/A	N/A	N/A	N/A
Excavator	67.4	63.4	N/A	N/A	N/A	N/A
Excavator	67.4	63.4	N/A	N/A	N/A	N/A
Generator	67.3	64.3	N/A	N/A	N/A	N/A
Generator	67.3	64.3	N/A	N/A	N/A	N/A
Dozer	68.4	64.4	N/A	N/A	N/A	N/A
Dozer	68.4	64.4	N/A	N/A	N/A	N/A
Total	76.3	76.1	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #6 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial East	Industrial	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	150	5
All Other Equipment > 5 HP	No	50	85		150	5
All Other Equipment > 5 HP	No	50	85		150	5
Excavator	No	40		80.7	150	5
Excavator	No	40		80.7	150	5
Excavator	No	40		80.7	150	5
Generator	No	50		80.6	150	5
Generator	No	50		80.6	150	5
Dozer	No	40		81.7	150	5
Dozer	No	40		81.7	150	5

Results

		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Saw		75	68	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		70.5	67.4	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		70.5	67.4	N/A	N/A	N/A	N/A
Excavator		66.2	62.2	N/A	N/A	N/A	N/A
Excavator		66.2	62.2	N/A	N/A	N/A	N/A
Excavator		66.2	62.2	N/A	N/A	N/A	N/A
Generator		66.1	63.1	N/A	N/A	N/A	N/A
Generator		66.1	63.1	N/A	N/A	N/A	N/A
Dozer		67.1	63.1	N/A	N/A	N/A	N/A
Dozer		67.1	63.1	N/A	N/A	N/A	N/A
	Total	75	74.9	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 11/25/2019
Case Description: Site Preparation

---- Receptor #1 ----

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

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	50	5
Dozer	No	40		81.7	50	5
Dozer	No	40		81.7	50	5
Tractor	No	40	84		50	5
Tractor	No	40	84		50	5
Tractor	No	40	84		50	5
Tractor	No	40	84		50	5

Results

Equipment		Calculated (dBA) *Lmax	L10	Noise Limits (dBA) Day Lmax	L10	Evening Lmax	L10
Dozer		76.7	75.7	N/A	N/A	N/A	N/A
Dozer		76.7	75.7	N/A	N/A	N/A	N/A
Dozer		76.7	75.7	N/A	N/A	N/A	N/A
Tractor		79	78	N/A	N/A	N/A	N/A
Tractor		79	78	N/A	N/A	N/A	N/A
Tractor		79	78	N/A	N/A	N/A	N/A
Tractor		79	78	N/A	N/A	N/A	N/A
	Total	79	85.6	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

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

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	80	5
Dozer	No	40		81.7	80	5
Dozer	No	40		81.7	80	5
Tractor	No	40	84		80	5
Tractor	No	40	84		80	5
Tractor	No	40	84		80	5
Tractor	No	40	84		80	5

Results

Equipment		Calculated (dBA) *Lmax	L10	Noise Limits (dBA) Day Lmax	L10	Evening Lmax	L10
Dozer		72.6	71.6	N/A	N/A	N/A	N/A
Dozer		72.6	71.6	N/A	N/A	N/A	N/A
Dozer		72.6	71.6	N/A	N/A	N/A	N/A
Tractor		74.9	73.9	N/A	N/A	N/A	N/A
Tractor		74.9	73.9	N/A	N/A	N/A	N/A
Tractor		74.9	73.9	N/A	N/A	N/A	N/A
Tractor		74.9	73.9	N/A	N/A	N/A	N/A
	Total	74.9	81.5	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

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

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	260	5
Dozer	No	40		81.7	260	5
Dozer	No	40		81.7	260	5
Tractor	No	40	84		260	5
Tractor	No	40	84		260	5
Tractor	No	40	84		260	5
Tractor	No	40	84		260	5

Results

Equipment		Calculated (dBA) *Lmax	L10	Noise Limits (dBA) Day Lmax	L10	Evening Lmax	L10
Dozer		62.3	61.4	N/A	N/A	N/A	N/A
Dozer		62.3	61.4	N/A	N/A	N/A	N/A
Dozer		62.3	61.4	N/A	N/A	N/A	N/A
Tractor		64.7	63.7	N/A	N/A	N/A	N/A
Tractor		64.7	63.7	N/A	N/A	N/A	N/A
Tractor		64.7	63.7	N/A	N/A	N/A	N/A
Tractor		64.7	63.7	N/A	N/A	N/A	N/A
	Total	64.7	71.3	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial North	Industrial	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	80	5
Dozer	No	40		81.7	80	5
Dozer	No	40		81.7	80	5
Tractor	No	40	84		80	5
Tractor	No	40	84		80	5
Tractor	No	40	84		80	5
Tractor	No	40	84		80	5

Results

Equipment		Calculated (dBA) *Lmax	L10	Noise Limits (dBA) Day Lmax	L10	Evening Lmax	L10
Dozer		72.6	71.6	N/A	N/A	N/A	N/A
Dozer		72.6	71.6	N/A	N/A	N/A	N/A
Dozer		72.6	71.6	N/A	N/A	N/A	N/A
Tractor		74.9	73.9	N/A	N/A	N/A	N/A
Tractor		74.9	73.9	N/A	N/A	N/A	N/A
Tractor		74.9	73.9	N/A	N/A	N/A	N/A
Tractor		74.9	73.9	N/A	N/A	N/A	N/A
	Total	74.9	81.5	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #5 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial South	Industrial	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	130	5
Dozer	No	40		81.7	130	5
Dozer	No	40		81.7	130	5
Tractor	No	40	84		130	5
Tractor	No	40	84		130	5
Tractor	No	40	84		130	5
Tractor	No	40	84		130	5

Results

Equipment		Calculated (dBA) *Lmax	L10	Noise Limits (dBA) Day Lmax	L10	Evening Lmax	L10
Dozer		68.4	67.4	N/A	N/A	N/A	N/A
Dozer		68.4	67.4	N/A	N/A	N/A	N/A
Dozer		68.4	67.4	N/A	N/A	N/A	N/A
Tractor		70.7	69.7	N/A	N/A	N/A	N/A
Tractor		70.7	69.7	N/A	N/A	N/A	N/A
Tractor		70.7	69.7	N/A	N/A	N/A	N/A
Tractor		70.7	69.7	N/A	N/A	N/A	N/A
	Total	70.7	77.3	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #6 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial East	Industrial	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Dozer	No	40		81.7	150	5
Dozer	No	40		81.7	150	5
Dozer	No	40		81.7	150	5
Tractor	No	40	84		150	5
Tractor	No	40	84		150	5
Tractor	No	40	84		150	5
Tractor	No	40	84		150	5

Results

Equipment		Calculated (dBA) *Lmax	L10	Noise Limits (dBA) Day Lmax	L10	Evening Lmax	L10
Dozer		67.1	66.1	N/A	N/A	N/A	N/A
Dozer		67.1	66.1	N/A	N/A	N/A	N/A
Dozer		67.1	66.1	N/A	N/A	N/A	N/A
Tractor		69.5	68.5	N/A	N/A	N/A	N/A
Tractor		69.5	68.5	N/A	N/A	N/A	N/A
Tractor		69.5	68.5	N/A	N/A	N/A	N/A
Tractor		69.5	68.5	N/A	N/A	N/A	N/A
	Total	69.5	76.1	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 11/25/2019
Case Description: Grading

---- Receptor #1 ----

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

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
			Equipment			
Excavator	No	40		80.7	50	5
Excavator	No	40		80.7	50	5
Grader	No	40	85		50	5
Dozer	No	40		81.7	50	5
Scraper	No	40		83.6	50	5
Scraper	No	40		83.6	50	5
Tractor	No	40	84		50	5
Tractor	No	40	84		50	5

Results

Equipment		Calculated (dBA) *Lmax	L10	Noise Limits (dBA) Day Lmax	L10	Evening Lmax	L10
Excavator		75.7	74.7	N/A	N/A	N/A	N/A
Excavator		75.7	74.7	N/A	N/A	N/A	N/A
Grader		80	79	N/A	N/A	N/A	N/A
Dozer		76.7	75.7	N/A	N/A	N/A	N/A
Scraper		78.6	77.6	N/A	N/A	N/A	N/A
Scraper		78.6	77.6	N/A	N/A	N/A	N/A
Tractor		79	78	N/A	N/A	N/A	N/A
Tractor		79	78	N/A	N/A	N/A	N/A
	Total	80	86.2	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

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

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	80	5
Excavator	No	40		80.7	80	5
Grader	No	40	85		80	5
Dozer	No	40		81.7	80	5
Scraper	No	40		83.6	80	5
Scraper	No	40		83.6	80	5
Tractor	No	40	84		80	5
Tractor	No	40	84		80	5

Results

Equipment		Calculated (dBA) *Lmax	L10	Noise Limits (dBA) Day Lmax	L10	Evening Lmax	L10
Excavator		71.6	70.6	N/A	N/A	N/A	N/A
Excavator		71.6	70.6	N/A	N/A	N/A	N/A
Grader		75.9	74.9	N/A	N/A	N/A	N/A
Dozer		72.6	71.6	N/A	N/A	N/A	N/A
Scraper		74.5	73.5	N/A	N/A	N/A	N/A
Scraper		74.5	73.5	N/A	N/A	N/A	N/A
Tractor		74.9	73.9	N/A	N/A	N/A	N/A
Tractor		74.9	73.9	N/A	N/A	N/A	N/A
	Total	75.9	82.1	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

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

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	260	5
Excavator	No	40		80.7	260	5
Grader	No	40	85		260	5
Dozer	No	40		81.7	260	5
Scraper	No	40		83.6	260	5
Scraper	No	40		83.6	260	5
Tractor	No	40	84		260	5
Tractor	No	40	84		260	5

Results

Equipment		Calculated (dBA) *Lmax	L10	Noise Limits (dBA) Day Lmax	L10	Evening Lmax	L10
Excavator		61.4	60.4	N/A	N/A	N/A	N/A
Excavator		61.4	60.4	N/A	N/A	N/A	N/A
Grader		65.7	64.7	N/A	N/A	N/A	N/A
Dozer		62.3	61.4	N/A	N/A	N/A	N/A
Scraper		64.3	63.3	N/A	N/A	N/A	N/A
Scraper		64.3	63.3	N/A	N/A	N/A	N/A
Tractor		64.7	63.7	N/A	N/A	N/A	N/A
Tractor		64.7	63.7	N/A	N/A	N/A	N/A
	Total	65.7	71.9	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial North	Industrial	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	80	5
Excavator	No	40		80.7	80	5
Grader	No	40	85		80	5
Dozer	No	40		81.7	80	5
Scraper	No	40		83.6	80	5
Scraper	No	40		83.6	80	5
Tractor	No	40	84		80	5
Tractor	No	40	84		80	5

Results

Equipment	Calculated (dBA) *Lmax	L10	Noise Limits (dBA) Day Lmax	L10	Evening Lmax	L10
Excavator	71.6	70.6	N/A	N/A	N/A	N/A
Excavator	71.6	70.6	N/A	N/A	N/A	N/A
Grader	75.9	74.9	N/A	N/A	N/A	N/A
Dozer	72.6	71.6	N/A	N/A	N/A	N/A
Scraper	74.5	73.5	N/A	N/A	N/A	N/A
Scraper	74.5	73.5	N/A	N/A	N/A	N/A
Tractor	74.9	73.9	N/A	N/A	N/A	N/A
Tractor	74.9	73.9	N/A	N/A	N/A	N/A
Total	75.9	82.1	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #5 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial South	Industrial	1	1	1

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	130	5
Excavator	No	40		80.7	130	5
Grader	No	40	85		130	5
Dozer	No	40		81.7	130	5
Scraper	No	40		83.6	130	5
Scraper	No	40		83.6	130	5
Tractor	No	40	84		130	5
Tractor	No	40	84		130	5

Results

		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		*Lmax	L10	Lmax	L10	Lmax	L10
Excavator		67.4	66.4	N/A	N/A	N/A	N/A
Excavator		67.4	66.4	N/A	N/A	N/A	N/A
Grader		71.7	70.7	N/A	N/A	N/A	N/A
Dozer		68.4	67.4	N/A	N/A	N/A	N/A
Scraper		70.3	69.3	N/A	N/A	N/A	N/A
Scraper		70.3	69.3	N/A	N/A	N/A	N/A
Tractor		70.7	69.7	N/A	N/A	N/A	N/A
Tractor		70.7	69.7	N/A	N/A	N/A	N/A
	Total	71.7	77.9	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #6 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial East	Industrial	1	1	1

Equipment

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	150	5
Excavator	No	40		80.7	150	5
Grader	No	40	85		150	5
Dozer	No	40		81.7	150	5
Scraper	No	40		83.6	150	5
Scraper	No	40		83.6	150	5
Tractor	No	40	84		150	5
Tractor	No	40	84		150	5

Results

		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		*Lmax	L10	Lmax	L10	Lmax	L10
Excavator		66.2	65.2	N/A	N/A	N/A	N/A
Excavator		66.2	65.2	N/A	N/A	N/A	N/A
Grader		70.5	69.5	N/A	N/A	N/A	N/A
Dozer		67.1	66.1	N/A	N/A	N/A	N/A
Scraper		69	68.1	N/A	N/A	N/A	N/A
Scraper		69	68.1	N/A	N/A	N/A	N/A
Tractor		69.5	68.5	N/A	N/A	N/A	N/A
Tractor		69.5	68.5	N/A	N/A	N/A	N/A
	Total	70.5	76.7	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 11/25/2019
Case Description: Building Construction

---- Receptor #1 ----

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

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	50	5
All Other Equipment > 5 HP	No	50	85		50	5
All Other Equipment > 5 HP	No	50	85		50	5
All Other Equipment > 5 HP	No	50	85		50	5
Generator	No	50		80.6	50	5
Tractor	No	40	84		50	5
Tractor	No	40	84		50	5
Tractor	No	40	84		50	5
Welder / Torch	No	40		74	50	5

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq
Crane		75.6	67.6	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		80	77	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		80	77	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		80	77	N/A	N/A	N/A	N/A
Generator		75.6	72.6	N/A	N/A	N/A	N/A
Tractor		79	75	N/A	N/A	N/A	N/A
Tractor		79	75	N/A	N/A	N/A	N/A
Tractor		79	75	N/A	N/A	N/A	N/A
Welder / Torch		69	65	N/A	N/A	N/A	N/A
	Total	80	84.4	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

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

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	80	5
All Other Equipment > 5 HP	No	50	85		80	5
All Other Equipment > 5 HP	No	50	85		80	5
All Other Equipment > 5 HP	No	50	85		80	5
Generator	No	50		80.6	80	5
Tractor	No	40	84		80	5
Tractor	No	40	84		80	5
Tractor	No	40	84		80	5
Welder / Torch	No	40		74	80	5

Results

		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane		71.5	63.5	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		75.9	72.9	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		75.9	72.9	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		75.9	72.9	N/A	N/A	N/A	N/A
Generator		71.5	68.5	N/A	N/A	N/A	N/A
Tractor		74.9	70.9	N/A	N/A	N/A	N/A
Tractor		74.9	70.9	N/A	N/A	N/A	N/A
Tractor		74.9	70.9	N/A	N/A	N/A	N/A
Welder / Torch		64.9	60.9	N/A	N/A	N/A	N/A
	Total	75.9	80.3	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

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

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	260	5
All Other Equipment > 5 HP	No	50	85		260	5
All Other Equipment > 5 HP	No	50	85		260	5
All Other Equipment > 5 HP	No	50	85		260	5
Generator	No	50		80.6	260	5
Tractor	No	40	84		260	5
Tractor	No	40	84		260	5
Tractor	No	40	84		260	5
Welder / Torch	No	40		74	260	5

Results

	Calculated (dBA)		Noise Limits (dBA)			
			Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	61.2	53.3	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	65.7	62.7	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	65.7	62.7	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	65.7	62.7	N/A	N/A	N/A	N/A
Generator	61.3	58.3	N/A	N/A	N/A	N/A
Tractor	64.7	60.7	N/A	N/A	N/A	N/A
Tractor	64.7	60.7	N/A	N/A	N/A	N/A
Tractor	64.7	60.7	N/A	N/A	N/A	N/A
Welder / Torch	54.7	50.7	N/A	N/A	N/A	N/A
Total	65.7	70	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial North	Industrial	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	80	5
All Other Equipment > 5 HP	No	50	85		80	5
All Other Equipment > 5 HP	No	50	85		80	5
All Other Equipment > 5 HP	No	50	85		80	5
Generator	No	50		80.6	80	5
Tractor	No	40	84		80	5
Tractor	No	40	84		80	5
Tractor	No	40	84		80	5
Welder / Torch	No	40		74	80	5

Results

		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane		71.5	63.5	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		75.9	72.9	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		75.9	72.9	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		75.9	72.9	N/A	N/A	N/A	N/A
Generator		71.5	68.5	N/A	N/A	N/A	N/A
Tractor		74.9	70.9	N/A	N/A	N/A	N/A
Tractor		74.9	70.9	N/A	N/A	N/A	N/A
Tractor		74.9	70.9	N/A	N/A	N/A	N/A
Welder / Torch		64.9	60.9	N/A	N/A	N/A	N/A
	Total	75.9	80.3	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #5 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial South	Industrial	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	130	5
All Other Equipment > 5 HP	No	50	85		130	5
All Other Equipment > 5 HP	No	50	85		130	5
All Other Equipment > 5 HP	No	50	85		130	5
Generator	No	50		80.6	130	5
Tractor	No	40	84		130	5
Tractor	No	40	84		130	5
Tractor	No	40	84		130	5
Welder / Torch	No	40		74	130	5

Results

Equipment	Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq
Crane	67.3	59.3	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	71.7	68.7	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	71.7	68.7	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	71.7	68.7	N/A	N/A	N/A	N/A
Generator	67.3	64.3	N/A	N/A	N/A	N/A
Tractor	70.7	66.7	N/A	N/A	N/A	N/A
Tractor	70.7	66.7	N/A	N/A	N/A	N/A
Tractor	70.7	66.7	N/A	N/A	N/A	N/A
Welder / Torch	60.7	56.7	N/A	N/A	N/A	N/A
Total	71.7	76.1	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #6 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
74.8	Industrial	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	150	5
All Other Equipment > 5 HP	No	50	85		150	5
All Other Equipment > 5 HP	No	50	85		150	5
All Other Equipment > 5 HP	No	50	85		150	5
Generator	No	50		80.6	150	5
Tractor	No	40	84		150	5
Tractor	No	40	84		150	5
Tractor	No	40	84		150	5
Welder / Torch	No	40		74	150	5

Results

	Calculated (dBA)		Noise Limits (dBA)			
			Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Crane	66	58	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	70.5	67.4	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	70.5	67.4	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	70.5	67.4	N/A	N/A	N/A	N/A
Generator	66.1	63.1	N/A	N/A	N/A	N/A
Tractor	69.5	65.5	N/A	N/A	N/A	N/A
Tractor	69.5	65.5	N/A	N/A	N/A	N/A
Tractor	69.5	65.5	N/A	N/A	N/A	N/A
Welder / Torch	59.5	55.5	N/A	N/A	N/A	N/A
Total	70.5	74.8	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 11/25/2019
Case Description: Paving

---- Receptor #1 ----

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

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	50	5
Paver	No	50		77.2	50	5
All Other Equipment > 5 HP	No	50	85		50	5
All Other Equipment > 5 HP	No	50	85		50	5
Roller	No	20		80	50	5
Roller	No	20		80	50	5

Results

	Calculated (dBA)		Noise Limits (dBA)			
			Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver	72.2	69.2	N/A	N/A	N/A	N/A
Paver	72.2	69.2	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	80	77	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	80	77	N/A	N/A	N/A	N/A
Roller	75	68	N/A	N/A	N/A	N/A
Roller	75	68	N/A	N/A	N/A	N/A
Total	80	81.1	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

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

Description	Impact Device	Usage(%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
			Equipment			
Paver	No	50		77.2	80	5
Paver	No	50		77.2	80	5
All Other Equipment > 5 HP	No	50	85		80	5
All Other Equipment > 5 HP	No	50	85		80	5
Roller	No	20		80	80	5
Roller	No	20		80	80	5

Results

	Calculated (dBA)		Noise Limits (dBA)			
			Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver	68.1	65.1	N/A	N/A	N/A	N/A
Paver	68.1	65.1	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	75.9	72.9	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	75.9	72.9	N/A	N/A	N/A	N/A
Roller	70.9	63.9	N/A	N/A	N/A	N/A
Roller	70.9	63.9	N/A	N/A	N/A	N/A
Total	75.9	77	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

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

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	260	5
Paver	No	50		77.2	260	5
All Other Equipment > 5 HP	No	50	85		260	5
All Other Equipment > 5 HP	No	50	85		260	5
Roller	No	20		80	260	5
Roller	No	20		80	260	5

Results

	Calculated (dBA)		Noise Limits (dBA)			
			Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver	57.9	54.9	N/A	N/A	N/A	N/A
Paver	57.9	54.9	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	65.7	62.7	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	65.7	62.7	N/A	N/A	N/A	N/A
Roller	60.7	53.7	N/A	N/A	N/A	N/A
Roller	60.7	53.7	N/A	N/A	N/A	N/A
Total	65.7	66.8	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial North	Industrial	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	80	5
Paver	No	50		77.2	80	5
All Other Equipment > 5 HP	No	50	85		80	5
All Other Equipment > 5 HP	No	50	85		80	5
Roller	No	20		80	80	5
Roller	No	20		80	80	5

Results

	Calculated (dBA)		Noise Limits (dBA)			
			Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver	68.1	65.1	N/A	N/A	N/A	N/A
Paver	68.1	65.1	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	75.9	72.9	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	75.9	72.9	N/A	N/A	N/A	N/A
Roller	70.9	63.9	N/A	N/A	N/A	N/A
Roller	70.9	63.9	N/A	N/A	N/A	N/A
Total	75.9	77	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #5 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial South	Industrial	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	130	5
Paver	No	50		77.2	130	5
All Other Equipment > 5 HP	No	50	85		130	5
All Other Equipment > 5 HP	No	50	85		130	5
Roller	No	20		80	130	5
Roller	No	20		80	130	5

Results

	Calculated (dBA)		Noise Limits (dBA)			
			Day		Evening	
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver	63.9	60.9	N/A	N/A	N/A	N/A
Paver	63.9	60.9	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	71.7	68.7	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP	71.7	68.7	N/A	N/A	N/A	N/A
Roller	66.7	59.7	N/A	N/A	N/A	N/A
Roller	66.7	59.7	N/A	N/A	N/A	N/A
Total	71.7	72.8	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #6 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial East	Industrial	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Paver	No	50		77.2	150	5
Paver	No	50		77.2	150	5
All Other Equipment > 5 HP	No	50	85		150	5
All Other Equipment > 5 HP	No	50	85		150	5
Roller	No	20		80	150	5
Roller	No	20		80	150	5

Results

		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Paver		62.7	59.7	N/A	N/A	N/A	N/A
Paver		62.7	59.7	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		70.5	67.4	N/A	N/A	N/A	N/A
All Other Equipment > 5 HP		70.5	67.4	N/A	N/A	N/A	N/A
Roller		65.5	58.5	N/A	N/A	N/A	N/A
Roller		65.5	58.5	N/A	N/A	N/A	N/A
	Total	70.5	71.6	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 11/25/2019
Case Description: Architectural Coating

---- Receptor #1 ----

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

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	50	5

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq
Compressor (air)		72.7	68.7	N/A	N/A	N/A	N/A
	Total	72.7	68.7	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

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

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	80	5

Results

Equipment		Calculated (dBA) *Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq
Compressor (air)		68.6	64.6	N/A	N/A	N/A	N/A
	Total	68.6	64.6	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

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

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Compressor (air)	No	40		77.7	260	1

				Results			
		Calculated (dBA)			Noise Limits (dBA)		
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)		62.3	58.4	N/A	N/A	N/A	N/A
	Total	62.3	58.4	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #4 ----

		Baselines (dBA)		
Description	Land Use	Daytime	Evening	Night
Industrial North	Industrial	1	1	1

			Equipment			
			Spec	Actual	Receptor	Estimated
	Impact		Lmax	Lmax	Distance	Shielding
Description	Device	Usage(%)	(dBA)	(dBA)	(feet)	(dBA)
Compressor (air)	No	40		77.7	80	5

				Results			
		Calculated (dBA)			Noise Limits (dBA)		
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)		68.6	64.6	N/A	N/A	N/A	N/A
	Total	68.6	64.6	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #5 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial South	Industrial	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	130	5

		Results					
		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)		64.4	60.4	N/A	N/A	N/A	N/A
	Total	64.4	60.4	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #6 ----

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Industrial East	Industrial	1	1	1

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	150	5

		Results					
		Calculated (dBA)		Noise Limits (dBA)			
				Day		Evening	
Equipment		*Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)		63.1	59.1	N/A	N/A	N/A	N/A
	Total	63.1	59.1	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.