Appendix

Appendix D Noise and Vibration Analysis

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Fundamentals of Noise

NOISE

Noise is most often defined as unwanted sound; whether it is loud, unpleasant, unexpected, or otherwise undesirable. Although sound can be easily measured, the perception of noise and the physical response to sound complicate the analysis of its impact on people. People judge the relative magnitude of sound sensation in subjective terms such as "noisiness" or "loudness."

Noise Descriptors

The following are brief definitions of terminology used in this chapter:

- **Sound.** A disturbance created by a vibrating object, which, when transmitted by pressure waves through a medium such as air, is capable of being detected by a receiving mechanism, such as the human ear or a microphone.

- **Noise.** Sound that is loud, unpleasant, unexpected, or otherwise undesirable.

- **Decibel (dB).** A unitless measure of sound, expressed on a logarithmic scale and with respect to a defined reference sound pressure. The standard reference pressure is 20 micropascals (20 μPa).

- **Vibration Decibel (VdB).** A unitless measure of vibration, expressed on a logarithmic scale and with respect to a defined reference vibration velocity. In the U.S., the standard reference velocity is 1 micro-inch per second ($1x10^{-6}$ in/sec).

- **A-Weighted Decibel (dBA).** An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.

- **Equivalent Continuous Noise Level (L_{eq}); also called the Energy-Equivalent Noise Level.** The value of an equivalent, steady sound level which, in a stated time period (often over an hour) and at a stated location, has the same A-weighted sound energy as the time-varying sound. Thus, the L_{eq} metric is a single numerical value that represents the equivalent amount of variable sound energy received by a receptor over the specified duration.

- **Statistical Sound Level (L_n).** The sound level that is exceeded "n" percent of time during a given sample period. For example, the L_{50} level is the statistical indicator of the time-varying noise signal that is exceeded 50 percent of the time (during each sampling period); that is, half of the sampling time, the changing noise levels are above this value and half of the time they are below it. This is called the "median sound level." The L_{10} level, likewise, is the value that is exceeded 10 percent of the time (i.e., near the maximum) and this is often known as the "intrusive sound level." The L_{90} is the sound level exceeded 90 percent of the time and is often considered the "effective background level" or "residual noise level."

- **Maximum Sound Level (L_{max})**. The highest RMS sound level measured during the measurement period.
- **Root Mean Square Sound Level (RMS).** The square root of the average of the square of the sound pressure over the measurement period.
- **Day-Night Sound Level (L_{dn} or DNL).** The energy-average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the sound levels occurring during the period from 10:00 PM to 7:00 AM.
- **Community Noise Equivalent Level (CNEL).** The energy average of the A-weighted sound levels occurring during a 24-hour period, with 5 dB added from 7:00 PM to 10:00 PM and 10 dB from 10:00 PM to 7:00 AM. NOTE: For general community/environmental noise, CNEL and L_{dn} values rarely differ by more than 1 dB (with the CNEL being only slightly more restrictive – that is, higher than the L_{dn} value). As a matter of practice, L_{dn} and CNEL values are interchangeable and are treated as equivalent in this assessment.
- **Peak Particle Velocity (PPV).** The peak rate of speed at which soil particles move (e.g., inches per second) due to ground vibration.
- **Sensitive Receptor.** Noise- and vibration-sensitive receptors include land uses where quiet environments are necessary for enjoyment and public health and safety. Residences, schools, motels and hotels, libraries, religious institutions, hospitals, and nursing homes are examples.

Characteristics of Sound

When an object vibrates, it radiates part of its energy in the form of a pressure wave. Sound is that pressure wave transmitted through the air. Technically, airborne sound is a rapid fluctuation or oscillation of air pressure above and below atmospheric pressure that creates sound waves.

Sound can be described in terms of amplitude (loudness), frequency (pitch), or duration (time). Loudness or amplitude is measured in dB, frequency or pitch is measured in Hertz [Hz] or cycles per second, and duration or time variations is measured in seconds or minutes.

Amplitude

Unlike linear units such as inches or pounds, decibels are measured on a logarithmic scale. Because of the physical characteristics of noise transmission and perception, the relative loudness of sound does not closely match the actual amounts of sound energy. Table 1 presents the subjective effect of changes in sound pressure levels. Ambient sounds generally range from 30 dBA (very quiet) to 100 dBA (very loud). Changes of 1 to 3 dB are detectable under quiet, controlled conditions, and changes of less than 1 dB are usually not discernible (even under ideal conditions). A 3 dB change in noise levels is considered the minimum change that is detectable with human hearing in outside environments. A change of 5 dB is readily discernible to most people in an exterior environment, and a 10 dB change is perceived as a doubling (or halving) of the sound.

Table 1 Noise Perceptibility

Change in dB	Noise Level

± 3 dB	Barely perceptible increase
± 5 dB	Readily perceptible increase
± 10 dB	Twice or half as loud
± 20 dB	Four times or one-quarter as loud

Source: California Department of Transportation (Caltrans). 2013, September. Technical Noise Supplement ("TeNS").

Frequency

The human ear is not equally sensitive to all frequencies. Sound waves below 16 Hz are not heard at all, but are "felt" more as a vibration. Similarly, though people with extremely sensitive hearing can hear sounds as high as 20,000 Hz, most people cannot hear above 15,000 Hz. In all cases, hearing acuity falls off rapidly above about 10,000 Hz and below about 200 Hz.

When describing sound and its effect on a human population, A-weighted (dBA) sound levels are typically used to approximate the response of the human ear. The A-weighted noise level has been found to correlate well with people's judgments of the "noisiness" of different sounds and has been used for many years as a measure of community and industrial noise. Although the A-weighted scale and the energy-equivalent metric are commonly used to quantify the range of human response to individual events or general community sound levels, the degree of annoyance or other response also depends on several other perceptibility factors, including:

- Ambient (background) sound level
- General nature of the existing conditions (e.g., quiet rural or busy urban)
- Difference between the magnitude of the sound event level and the ambient condition
- Duration of the sound event
- Number of event occurrences and their repetitiveness
- Time of day that the event occurs

Duration

Time variation in noise exposure is typically expressed in terms of a steady-state energy level equal to the energy content of the time varying period (called L_{eq}), or alternately, as a statistical description of the sound level that is exceeded over some fraction of a given observation period. For example, the L_{50} noise level represents the noise level that is exceeded 50 percent of the time; half the time the noise level exceeds this level and half the time the noise level is less than this level. This level is also representative of the level that is exceeded 30 minutes in an hour. Similarly, the L_2, L_8 and L_{25} values represent the noise levels that are exceeded 2, 8, and 25 percent of the time or 1, 5, and 15 minutes per hour, respectively. These "n" values are typically used to demonstrate compliance for stationary noise sources with many cities' noise ordinances. Other values typically noted during a noise survey are the L_{min} and L_{max}. These values represent the minimum and maximum root-mean-square noise levels obtained over the measurement period, respectively.

Because community receptors are more sensitive to unwanted noise intrusion during the evening and at night, state law and many local jurisdictions use an adjusted 24-hour noise descriptor called the Community Noise Equivalent Level (CNEL) or Day-Night Noise Level (L_{dn}). The CNEL descriptor requires that an artificial increment (or "penalty") of 5 dBA be added to the actual noise level for the hours from 7:00 PM to 10:00 PM and 10 dBA for the hours from 10:00 PM to 7:00 AM. The L_{dn} descriptor uses the same methodology

except that there is no artificial increment added to the hours between 7:00 PM and 10:00 PM. Both descriptors give roughly the same 24-hour level, with the CNEL being only slightly more restrictive (i.e., higher). The CNEL or L_{dn} metrics are commonly applied to the assessment of roadway and airport-related noise sources.

Sound Propagation

Sound dissipates exponentially with distance from the noise source. This phenomenon is known as "spreading loss." For a single-point source, sound levels decrease by approximately 6 dB for each doubling of distance from the source (conservatively neglecting ground attenuation effects, air absorption factors, and barrier shielding). For example, if a backhoe at 50 feet generates 84 dBA, at 100 feet the noise level would be 79 dBA, and at 200 feet it would be 73 dBA. This drop-off rate is appropriate for noise generated by on-site operations from stationary equipment or activity at a project site. If noise is produced by a line source, such as highway traffic, the sound decreases by 3 dB for each doubling of distance over a reflective ("hard site") surface such as concrete or asphalt. Line source noise in a relatively flat environment with ground-level absorptive vegetation decreases by an additional 1.5 dB for each doubling of distance.

Psychological and Physiological Effects of Noise

Physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 dBA. Exposure to high noise levels affects the entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions, thereby affecting blood pressure and functions of the heart and the nervous system. Extended periods of noise exposure above 90 dBA results in permanent cell damage, which is the main driver for employee hearing protection regulations in the workplace. For community environments, the ambient or background noise problem is widespread, through generally worse in urban areas than in outlying, less-developed areas. Elevated ambient noise levels can result in noise interference (e.g., speech interruption/masking, sleep disturbance, disturbance of concentration) and cause annoyance. Since most people do not routinely work with decibels or A-weighted sound levels, it is often difficult to appreciate what a given sound pressure level number means. To help relate noise level values to common experience, Table 2 shows typical noise levels from familiar sources.

Table 2 Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Onset of physical discomfort	120+	
	110	Rock Band (near amplification system)
Jet Flyover at 1,000 feet		
	100	
Gas Lawn Mower at three feet		
	90	
Diesel Truck at 50 feet, at 50 mph		Food Blender at 3 feet
	80	Garbage Disposal at 3 feet
Noisy Urban Area, Daytime		
	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 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 (Caltrans). 2013, September. Technical Noise Supplement ("TeNS").

Vibration Fundamentals

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Vibration is normally associated with activities stemming from operations of railroads or vibration-intensive stationary sources, but can also be associated with construction equipment such as jackhammers, pile drivers, and hydraulic hammers. As with noise, vibration can be described by both its amplitude and frequency. Vibration displacement is the distance that a point on a surface moves away from its original static position; velocity is the instantaneous speed that a point on a surface moves; and acceleration is the rate of change of the speed. Each of these descriptors can be used to correlate vibration to human response, building damage, and acceptable equipment vibration levels. During construction, the operation of construction equipment can cause groundborne vibration. During the operational phase of a project, receptors may be subject to levels of vibration that can cause annoyance due to noise generated from vibration of a structure or items within a structure.

Vibration amplitudes are usually described in terms of either the peak particle velocity (PPV) or the root mean square (RMS) velocity. PPV is the maximum instantaneous peak of the vibration signal and RMS is the

square root of the average of the squared amplitude of the signal. PPV is more appropriate for evaluating potential building damage and RMS is typically more suitable for evaluating human response.

As with airborne sound, annoyance with vibrational energy is a subjective measure, depending on the level of activity and the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Persons accustomed to elevated ambient vibration levels, such as in an urban environment, may tolerate higher vibration levels. Table 3 displays the human response and the effects on buildings resulting from continuous vibration (in terms of various levels of PPV).

Table 3 Human Reaction to Typical Vibration Levels

Vibration Level, PPV (in/sec)	Human Reaction	Effect on Buildings
0.006–0.019	Threshold of perception, possibility of intrusion	Vibrations unlikely to cause damage of any type
0.08	Vibrations readily perceptible	Recommended upper level of vibration to which ruins and ancient monuments should be subjected
0.10	Level at which continuous vibration begins to annoy people	Virtually no risk of "architectural" (i.e. not structural) damage to normal buildings
0.20	Vibrations annoying to people in buildings	Threshold at which there is a risk to "architectural" damage to normal dwelling – houses with plastered walls and ceilings
0.4–0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause "architectural" damage and possibly minor structural damage

Source: California Department of Transportation (Caltrans). 2020, April. *Transportation and Construction Vibration Guidance Manual*. Prepared by ICF International.

LOCAL REGULATIONS AND STANDARDS

CHAPTER 11

Noise Element

Introduction

Pico Rivera recognizes the relationship between noise and the well-being of the community. Residents seek a peaceful living environment, and businesses seek the ability to conduct business without being interrupted by excessive noise levels. As a result, excessive noise levels can affect the physical health, property values, and economic productivity of the city's residents and businesses.

Regulating noise is thus essential to creating a peaceful and productive community. The City's ability to regulate noise falls into three broad classifications: achieving noise compatible land uses, addressing noise generated by transportation, and dealing with noise generated by temporary construction activities. Achieving noise compatible land use involves making sure that new development is placed within an appropriate noise setting and that adjacent land uses do not generate so much noise that they disturb adjacent uses. Addressing transportation noise generated by the highways, roadway, and rail lines that run through the community, focuses attention on protecting the land uses adjacent to these transportation facilities from excessive noise. Finally, dealing with noise generated by temporary construction activities includes regulating the timing of constructing during the day and working with developers to reduce noise generated by construction equipment.

This element examines noise sources in Pico Rivera with a view toward identifying and evaluating the potential for noise conflicts, and identifies ways to reduce existing and potential noise impacts. This element addresses noise that affects the community at large, rather than noise associated with site-specific conditions. It contains goals, policies, and implementation programs to achieve and maintain noise levels compatible with various land uses.

Noise Context

Noise has long been an accepted part of modern civilization and the urbanization process. The City of Pico Rivera is subject to noise sources that can be generally classified as transportation noise sources and stationary noise sources.

- **Traffic Noise.** Primary noise sources in Pico Rivera are and will continue to be transportation related. Existing and future traffic noise is greatest along the city's major roadways which include Rosemead Boulevard, Paramount Boulevard, Beverly Boulevard, Whittier Boulevard, Washington Boulevard,

Slauson Boulevard, and Telegraph Road, as shown in **Appendix G**, **Tables G-1** and **G-2**. Future roadway noise exposure and contour distances based on development allowed under this General Plan are presented in **Appendix G**, **Table G-3**.

- **Railroads.** Both the Burlington Northern Santa Fe (BNSF) and Union Pacific railroads maintain lines through the city, as shown in **Figure 5-4**. Metrolink, a regional rail system that includes commuter and passenger services also has lines through the city. Existing and future railroad noise is shown in **Appendix G**, **Tables G-1 and G-2**.

  Future transit facilities to be located in the city are being considered and include the Metro Gold Line light rail but is not anticipated to generate a significant amount of noise. The California High Speed Rail Authority is also considering an east-west alignment of the High Speed Rail line through the city, to be located north of Slauson Avenue. Implementation of either transit facility would result in substantially higher, although intermittent noise levels along those transit corridors and within adjacent areas.

- **Stationary Sources.** Stationary noise sources also contribute to the ambient noise environment in Pico Rivera. Within the community, stationary noise sources related to industry and construction are present. Industrial noise is typically generated by industrial processing and operations, as well as maintenance yards. Construction noise sources can be from diesel engines, air compressors, and electric motors. Residential areas can generate noise through the use of heating and cooling equipment, and through landscape maintenance activities such as gasoline-powered lawnmowers. Commercial uses can generate noise through the operation of rooftop heating and cooling equipment, and other activities such as trash collection and deliveries.

Characteristics of Noise

The principal characteristics of sound are its loudness (amplitude) and frequency (pitch). The frequency of a sound is significant because the human ear is not equally sensitive to all frequencies. The ear is not very sensitive to low frequencies, characterized as a rumble or roar. The ear, however, is most sensitive at higher frequencies, characterized as a screech or a whine. To reflect this varying sensitivity, an A-weighted decibel scale (dBA) is typically used to measure the perceived loudness of a sound.

Noise refers to sound pressure variations audible to the ear. Whether the sound is judged as noise depends largely on the listener's current activity and attitude toward the sound source as well as the amplitude and frequency of the sound. To obtain convenient measurements and sensitivities at extremely low and high sound pressures, sound is measured in units of the decibel (dBA). A listener often judges an increase in sound levels of 10 dBA as a doubling of sound. Examples of the decibel level of various noise sources are shown in **Figure 11-1.**

Maximum Sound Level

The Maximum Sound Level is the highest A-weighted sound level observed during a single noise event no matter how long the sound may persist.

Sound Exposure Level (SEL)

The Sound Exposure Level value represents the A-weighted sound level integrated over the entire duration of one second. Hence, it normalizes the event to a 1-second event. Typically, most events last longer than one second, and the SEL value will be higher than the maximum sound level of the event. SEL is usually applied in situations with multiple sound events, each one having its own characteristic SEL.

Equivalent Noise Level (Leq)

The equivalent noise level (Leq) is a measure of the exposure resulting from the accumulation of A-weighted sound levels over a particular time period. Conceptually, Leq may be thought of as a constant sound level over the period of interest that contains as much sound energy as the actual time-varying sound level with its normal peaks and valleys.

Day-Night Average Sound Level (Ldn)

The Day-Night Average Sound Level is the 24-hour energy average A-weighted sound level with a 10dBA weighing added to those levels occurring between 10 p.m. and 7 a.m. the following morning. The 10 dBA weighing is a penalty representing the added intrusiveness of noise during normal sleeping hours. Ldn is used to determine land use compatibility with noise from aircraft and surface traffic. The expression Ldn is often used in equations to designate the day-night average sound level.

Figure 11-1: Common Noise Sources

Community Noise Equivalent Level (CNEL)

The Community Noise Equivalent Level is an artificial decibel increment added to quiet-time noise levels in a 24-hour noise receptor because community receptors are more sensitive to unwanted noise intrusion during the evening and at night. An addition of five decibels is added to sound levels that occur in the evening from 7:00 p.m. to 10:00 p.m., and an addition of 10 decibels to sound levels that occur between 10:00 p.m. and 7:00 a.m. An interior CNEL of 45 dBA is mandated for multi-unit residential dwellings and is considered a desirable noise exposure for single-unit residential dwellings as well. Since typical noise attenuation within residential structures with closed windows is well over 20 decibels, an exterior noise exposure of 65 decibels CNEL is generally the noise/land use compatibility guideline for new residential dwellings in California.

Vibration

Vibration is produced when moving objects in contact with the ground radiate mechanical energy through the ground. If the object is massive enough and/or close enough to an observer, the ground vibrations are perceptible. Vibration magnitude is measured in vibration decibels (VdB).

Effects of Noise

Documented effects of excessive noise on people can range from annoyance and inconvenience to temporary or permanent hearing loss. However, problems associated with noise can be much more widespread. Although no human illness is known to be directly caused by noise, studies have shown that noise is an important cause of physical and psychological stress, and stress has been directly linked to many common health problems. Therefore, noise can be associated with many disabilities and diseases, such as heart disease, high blood pressure, headaches, fatigue, and irritability. Noise is also suspected to interfere with children's learning. Excessive background noise can reduce the amount and quality of verbal exchange and, therefore, impact education, family lifestyles, occupational efficiency, and the quality of recreation and leisure time.

Sensitive Noise Receptors

Noise sensitive land use are defined as those specific land uses that have associated indoor and/or outdoor human activities that may be subject to stress and/or significant interference from noise produced by community sound sources. Such human activity typically occurs daily for continuous periods of 24 hours or is of such a nature that noise is significantly disruptive to activities that occur for shorter periods. Specifically, noise-sensitive land uses in Pico Rivera include: residences of all types, health care facilities, libraries, cultural facilities, places of worship, schools and day care centers. Minimizing noise exposure to sensitive areas is important to ensure the proper function of land uses and to maintain the quality of life.

Relatively noise tolerant land uses are business, commercial, and professional developments. Noise tolerant receptors include industrial, manufacturing, utilities, natural open space, undeveloped land, parking lots, and transit terminals.

Goals, Policies, and Implementation Actions

Land Use Compatibility

Goal 11.1

An acceptable noise environment for existing and future residents that also meets the business needs of the community.

Policy 11.1-1 Land Use Compatibility. Strive to achieve and maintain land use patterns that are consistent with the noise compatibility guidelines set forth in **Table 11-1**.

Table 11-1:
Maximum Allowable Environmental Noise Standards

Land Use	Hours of Day	
	Exterior Noise Level From Property Line	Interior Noise Level (1)
	Ldn/CNEL, dB	Ldn/CNEL, dB
Residential (Low Density, Multi Family, Mixed-Use)	65	45
Transient Lodging (Motels/Hotels)	65	45
Schools, Libraries, Churches, Hospitals/Medical Facilities, Nursing Homes, Museums	70	45
Theaters, Auditoriums	70	N/A
Playgrounds, Parks	75	N/A
Golf Courses, Riding Stables, Water Recreation	75	N/A
Office Buildings, Business Commercial and Professional	70	N/A
Industrial, Manufacturing, and Utilities	75	N/A

The noise level standard is the maximum decibel level which may be imposed upon the referenced land use.

Where a proposed use is not specifically listed on this table, the use shall comply with the noise exposure standards for the nearest similar use as determined by the Planning Director.

1) This noise exposure maximum requires window and doors to remain closed to achieve the acceptable interior noise level and will necessitate the use of an air conditioning unit and/or exterior noise level reduction measures such as a block wall and double pane windows.

Policy 11.1-2 Existing Noise Incompatibilities. Within areas where existing or future noise levels exceed the guidelines set forth in Table 11-1, encourage establishment of noise buffers and barriers, modifications to noise-generating operations, and/or retrofitting of buildings housing noise-sensitive uses, where feasible and appropriate.

Implementation Program for Policies 11.1-1 through 11.1-2:

- *Adopt regulations in the zoning ordinance addressing acceptable noise and vibration levels and duration.*

Policy 11.1-3 New Noise-Sensitive Development. Require development of new noise-sensitive land uses to provide appropriate noise buffers or barriers, as well as to implement feasible building designs needed to meet the noise compatibility guidelines shown in Table 11-1.

Policy 11.1-4 New Stationary Noise Sources. Require new stationary noise sources to mitigate impacts on noise-sensitive uses consistent with the noise compatibility guidelines set forth in Table 11-1.

Policy 11.1-5 Development Site Planning. Encourage new mixed use and multi-unit residential developments to provide for separation of onsite noise-sensitive and noise-generating uses to the extent feasible, as well as to use appropriate building placement to create noise barriers that protect noise-sensitive uses. In addition to sound barriers, design techniques to mitigate noise impacts may include, but are not limited to:

- Increase building setbacks to increase the distance between the noise source and sensitive receptor.
- Orient buildings which are compatible with higher noise levels adjacent to noise generators or in clusters to shield more noise sensitive areas and uses.
- Orient delivery, loading docks, and outdoor work areas away from noise-sensitive uses.
- Place noise tolerant uses, such as parking areas, and noise tolerant structures, such as garages, between the noise source and sensitive receptor.
- Cluster office, commercial, or multi-unit residential structures to reduce noise levels within interior open space areas.
- Provide double glazed and double paned windows on the side of the structure facing a major noise source, and place entries away from the noise source to the extent possible.

Implementation Program for Policies 11.1-3 through 11.1-5:

- *Require preparation of noise studies as part of the development review process for projects involving development of noise sensitive uses in proximity to major noise sources or development that has the potential to impact noise sensitive land uses. Mitigation should minimize noise-related annoyance, sleep disruption, speech interference, and other similar effects using metrics and methodologies appropriate to the effect(s) to be assessed and avoided.*

Transportation-Related Noise

Goal 11.2

Minimize disruptions to residential neighborhoods and businesses caused by transportation-related noise.

Policy 11.2-1 New High Noise-Generating Uses. Locate future transit stations, rail projects such as the potential Metro Gold Line light rail and High Speed Rail, or other high noise-generating uses away from noise-sensitive land uses to the extent feasible.

Implementation Program for Policy 11.2-1:

- *Request that transportation agencies proposing facilities improvements and routes through Pico Rivera fully analyze potential noise impacts, and provide noise reducing measures as part of project design such that noise impacts of proposed transportation facilities are consistent with the standards set forth in Table 11-1.*

Policy 11.2-2 Mitigation along Roadways. Include noise mitigation measures in the design of street and highway improvement projects adjacent to noise-sensitive areas. Measures should emphasize the establishment of natural buffers or use of setbacks between roadways and adjoining noise sensitive uses, and use of pavements that reduce roadway noise, when feasible.

Policy 11.2-3 Speed Limits. Enforce established speed limits to control noise levels.

Implementation Program for Policy 11.2-3:

- *Consider installation of traffic calming improvements along roadways within residential areas where speeding is an ongoing problem.*

Policy 11.2-4 Truck Routes. Maintain a system of truck routes that avoid truck travel through or adjacent existing and future residential neighborhoods, to the extent feasible.

Policy 11.2-5 Development along Major Roadways and Rail Lines. Require that noise attenuation measures be incorporated into all new development and remodels of noise-sensitive uses in close proximity to major roadways and existing or known planned rail lines where railroad-generated noise levels exceed the guidelines set forth in **Table 11-1**.

Implementation Program for Policy 11.2-5:

- *As part of railroad grade separation projects, consider acquisition of residential uses immediately adjacent to the rail line as part of project improvements.*

Policy 11.2-6 Railroad Noise. Work with the railroad lines operating in Pico Rivera to minimize noise levels produced by trains and whistle noise by continuing to construct additional grade separations at busy intersections, reducing nighttime operations, and maintaining consistency with the noise levels shown in Table 11-1.

Implementation Program for Policy 11.2-6:

- *Continue to pursue federal, State, regional, and local funds to construct additional grade separations at busy intersections within the City.*

Construction Noise Sources

Goal 11.3

Minimize disruptions to residential neighborhoods and businesses caused by construction-related noise.

Policy 11.3-1 Construction Noise. Minimize construction-related noise and vibration by limiting construction activities within 500 feet of noise-sensitive uses from 7:00 A.M. to 7:00 P.M. seven days a week; after hour permission shall be granted by City staff, Planning Commission, or the City Council.

- Require proposed development adjacent to occupied noise sensitive land uses to implement a construction-related noise mitigation plan. This plan would depict the location of construction equipment storage and maintenance areas, and document methods to be employed to minimize noise impacts on adjacent noise sensitive land uses.
- Require that construction equipment utilize noise reduction features (e.g., mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer.
- Require that haul truck deliveries be subject to the same hours specified for construction. Additionally, the plan shall denote any construction traffic haul routes where heavy trucks would exceed 100 daily trips (counting those both to and from the construction site). To the extent feasible, the plan shall denote haul routes that do not pass sensitive land uses or residential dwellings.

Policy 11.3-2 Vibration Standards. Require construction projects and new development anticipated to generate a significant amount of vibration to ensure acceptable interior vibration levels at nearby noise-sensitive uses based on Federal Transit Administration criteria as shown in **Table 11-2**.

Table 11-2:
Groundborne Vibration Impact Criteria for General Assessment

Land Use Category	Impact Levels (VdB)		
	Frequent Events[a]	Occasional Events[b]	Infrequent Events[c]
Category 1: Buildings where vibration would interfere with interior operations	65[d]	65[d]	65[d]
Category 2: Residences and buildings where people normally sleep	72	75	80
Category 3: Institutional land uses with primarily daytime uses	75	78	83

Vibration levels are measured in or near the vibration-sensitive use.

a. "Frequent Events" is defined as more than 70 vibration events of the same source per day.

b. "Occasional Events" is defined as between 30 and 70 vibration events of the same source per day.

c. "Infrequent Events" is defined as fewer than 30 vibration events of the same source per day.

d. This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration-sensitive manufacturing or research will require detailed evaluation to define the acceptable vibration levels.

Source: Federal Transit Administration, Transit Noise Impact and Vibration Assessment, May 2006.

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18.42.050 Special use conditions and chart notes.

The regulations governing development of property set forth in Table 18.42.040, the Property Development Regulations Chart, as may be applicable, shall be subject to the provisions of this section, as follows:

A. Relationship to Chart. Special development conditions, requirements and limitations governing property development regu-lations indicated by a parenthetic number appearing in the zone column of the Property Development Regulations Chart, correspond to the specific numbered conditions, requirements or limitations set forth in subsection B of this section.

B. Development Conditions, Requirements and Limitations Enumerated. Special development conditions, requirements and limitations for the development of property set forth in Table 18.42.040, the Property Development Regulations Chart, are as follows:

Note 1. Every lot shall have and maintain frontage along a publicly dedicated and improved street, and shall have unobstructed access to such street or to a publicly dedicated and improved alley.

Note 2. Every lot shall be provided with a means of access to a publicly dedicated and improved street. For purposes of the R-I and PUD zoned districts, the front property line shall be considered that portion of property from which vehicular access is taken.

Note 3. In the case when development occurs on a corner or reverse corner lot that has frontage along a major, secondary, collector or local street, or any combination thereof, as designated and defined in the circulation element of the general plan, the front lot line and permitted vehicular access to such lot shall be determined by that portion of the lot congruent with the right-of-way of the street designated as having the highest classification of traffic-generating capacity. All other lot lines shall be relative to such determined front lot as set forth herein.

Note 4. Whenever property located in this zone classification abuts property located in the O-S, R-E, S-F, PUD or R-M zone, such property shall be separated therefrom by a publicly dedicated and improved alley.

Note 5. Frequency of the C-N zone shall not be established or applied on any property located within a radius of one thousand feet of another C-N zone.

Note 6. This requirement shall apply only to an individually owned lot upon which a single-family dwelling unit is located.

Note 7. The number of acres set forth shall be the minimum, except, in the case where a range is indicated, it shall be the minimum and/or maximum in order to establish or apply this zone classification on any property or a combination of properties.

Note 8. See Section 18.08.110 of this title for regulations governing lots of record.

Note 9. Except in selected areas of the community where it has been clearly demonstrated and established through the zone reclassification process that such areas possess those characteristics more closely associated with single-family residential neighborhoods, lots may contain less than twelve thousand five hundred square feet of lot area, but in no case shall the lot area be less than six thousand square feet.

Note 10. Any lot having a lot area greater than the minimum required herein may be developed with more than one detached single-family dwelling unit. A lot qualifying for such additional dwelling unit development shall contain not less than fifteen thousand square feet of lot area for each such dwelling unit thereafter. In no case shall there be more than a total of four such dwelling units, and such development thereof shall be subject to a precise plan of design, as set forth in Article I of Chapter 18.48 of this title.

addition to the required setback.

Note 49. Design Standards. Each single-family dwelling unit, including foundational mobilehome units, shall comply with the following design standards:

a. Exterior Siding. Each dwelling structure and additions thereto shall have exterior siding of wood, stucco, masonry, asbestos shingle, or other approved material which is formed and finished to give the appearance of such materials described in this subsection.

b. Roofing Materials. Each dwelling structure shall have a roof constructed of wood shake, shingle, asphalt composition, fiberglass shingle, crushed rock, tile, or other approved material. Metal roofing shall be prohibited, except that which is formed and finished to represent wood shake or tile or shingle, and excepting metal patio covers, when located on or to the rear of the structure.

Note 50. All construction activities on any lot or parcel shall take place only between the hours of seven a.m. and seven p.m. except for purposes of emergencies.

Note 51. All new construction and additions five hundred square feet or greater shall be subject to approval of a precise plan of design. All new construction and additions of one thousand five hundred square feet or greater shall be subject to approval of a conditional use permit. If a conditional use permit is required for a project, then a precise plan of design is not required.

Note 52. The following standard shall apply to all hazardous waste facilities:

a. Buffer zones and screening walls for all facilities shall be in accordance with federal, state and county guidelines and/or shall be determined by the director of building and planning after evaluation of any submitted risk assessment.

Note 53. Development to comply with water efficient landscaping provisions set forth in Chapter 13.90 of this code.

Note 54. Storage on the roof is prohibited except for legally permitted mechanical equipment.

Note 55. Any new public facility, institutional, commercial, industrial building, or residential development of five units or more, or new construction that would add thirty percent to the existing floor area of same, shall be subject to the requirements of Chapter 18.43 (recycling space allocation) of this title.

Note 56. Zero lot line development permitted on one interior lot line, with a minimum eight-foot opposite side yard setback.

Note 57. New construction must comply with Article II of this chapter, the public image enhancement program.

Note 58. The maximum height from grade allotted is sixty feet or five stories for properties on major roadways as described per the Circulation Element of the General Plan. For properties not located on a major roadway, the height shall be that of the underlying base zone.

Note 59. a. The maximum intensity (non-residential component of mixed-use project) shall be 1.0 floor area ratio (FAR). Podium or underground parking is not counted toward the FAR.

b. A minimum distance between buildings of ten feet for buildings up to twenty-five feet in height and twenty-five feet for buildings above twenty-five feet.

Note 60. A minimum of a five-foot front landscaped setback required. The five-foot setback shall be allowed only when the setback is:

a. In-line with the front yard setback of adjacent buildings within plus or minus ten feet.

b. Has a major entrance from the front yard setback.

c. Achieves a pedestrian scale. See Design guidelines Note 63.

Should (a) above not be achieved the setback shall be fifteen feet and shall require that (b) and (c) are met.

Note 61. The minimum interior setback requirement shall be five feet for buildings under forty-two feet in height and/or located on major roadways as described per the Circulation Element of the General Plan. The minimum interior setback requirement shall be ten feet for properties not located on a major roadway and/or over forty-two feet in height.

Note 62. Projections.

Chapter 8.40 NOISE

8.40.010 Unnecessary noises prohibited.

A. No person shall make, cause or suffer, or permit to be made, upon any premises owned, occupied or controlled by him, any unnecessary noises or sounds which are physically annoying to persons of ordinary sensitiveness, or which are so harsh or so prolonged or unnatural or unusual in their use, time or place as to occasion physical discomfort to the inhabitants of any neighborhood.

B. When any loud or unruly assemblage occurs or is held, and the city's law enforcement agency is required to respond to the scene in response to citizen complaints, and the senior peace officer at the scene determines that there is a threat to the public peace, health, safety or general welfare, then that senior peace officer shall notify the owner of the property and/or the person in charge of the property where the assemblage exists, and/or the person responsible for said assemblage, that such person or persons, or in the case of a minor, the parents and/or guardians of such minor, shall be held personally liable for the cost of providing additional law enforcement personnel on special security assignment over and above the normal services provided by the law enforcement agency in response to such assemblage. Such person or persons shall be given a first warning, in the form of notification by the senior peace officer that the first police response shall be deemed to be the normal police services provided. Such notice may include a written notice, receipt of which is signed by the owner, responsible person or person in charge. The police personnel necessarily utilized after such first warning to control the threat to the public peace, health, safety or general welfare shall be deemed to be on special security assignment over and above the normal services provided and the owner of the property and/or the person in charge of the property where such assemblage occurs, and/or the person responsible for the cost of such special security assignment in an amount determined upon a cost accounting basis by the city. The cost of such special security assignment shall include damage to city property and/or injuries to city personnel. A fee charged will not be in excess of five hundred dollars for a single incident. The city reserves its legal options to elect any other legal remedies when said costs or damage exceed five hundred dollars.

C. The city council declares that loud or unruly assemblages described in subsection B of this section are a public nuisance. The cost of abating such public nuisance, including police services, may be made a lien upon the property where the nuisance is located, and/or collected as a special assessment against the property at the same time and in the same manner as ordinary municipal taxes are collected. Prior to the recordation of the lien, or the collection of the charge in the manner of a municipal tax, the property owner shall be entitled to a hearing before the city council upon at least ten days prior written notice. Notice shall be given in accordance with Government Code Section 38773.1. (Ord. 873 § 1, 1995; prior code § 4201)

8.40.020 Motor vehicle operation—Restrictions.

A person shall not operate any motor vehicle (including any motorcycle, trail bike, dune buggy, motor scooter, go-cart or jeep), or the motor thereof, on any vacant lot, parking lot, vacant property or acreage so as to disturb the peace or quiet of any neighborhood by noise, dust, smoke or fumes caused by such motor vehicle. (Prior code § 4201.1)

8.40.030 Motor vehicle operation—Exceptions.

The provisions of Section 8.40.020 do not apply to any act prohibited by Section 372 of the Penal Code, or prohibited or expressly permitted by any statute of the state. (Prior code § 4201.2)

CONSTRUCTION NOISE MODELING

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 05/13/2021
Case Description: Demo

**** Receptor #1 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Demo	Residential	65.0	60.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Concrete Saw	No	20		89.6	50.0	0.0
Dozer	No	40		81.7	50.0	0.0
Tractor	No	40		84.0	50.0	0.0
Front End Loader	No	40		79.1	50.0	0.0
Backhoe	No	40		77.6	50.0	0.0

Results

	Noise Limits (dBA)						Noise Limit Exceedance (dBA)					
	Calculated (dBA)		Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Concrete Saw	89.6	82.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	81.7	77.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	84.0	80.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	79.1	75.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	89.6	86.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 05/16/2021
Case Description: RoughGrading

**** Receptor #1 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Rough Grading	Residential	65.0	60.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85.0		50.0	0.0
Dozer	No	40		81.7	50.0	0.0
Tractor	No	40	84.0		50.0	0.0
Backhoe	No	40		77.6	50.0	0.0
Front End Loader	No	40		79.1	50.0	0.0
Excavator	No	40		80.7	50.0	0.0
Scraper	No	40		83.6	50.0	0.0
Roller	No	20		80.0	50.0	0.0

Results

Equipment	Calculated (dBA) Lmax	Calculated (dBA) Leq	Noise Limits (dBA) Day Lmax	Noise Limits (dBA) Day Leq	Noise Limits (dBA) Evening Lmax	Noise Limits (dBA) Evening Leq	Noise Limits (dBA) Night Lmax	Noise Limits (dBA) Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Noise Limit Exceedance (dBA) Day Leq	Noise Limit Exceedance (dBA) Evening Lmax	Noise Limit Exceedance (dBA) Evening Leq	Noise Limit Exceedance (dBA) Night Lmax	Noise Limit Exceedance (dBA) Night Leq
Grader	85.0	81.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	81.7	77.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	84.0	80.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	79.1	75.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	80.7	76.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	83.6	79.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	80.0	73.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	85.0	87.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 05/16/2021
Case Description: FineGrading

**** Receptor #1 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Fine Grading	Residential	65.0	60.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Tractor	No	40	84.0		50.0	0.0
Backhoe	No	40		77.6	50.0	0.0
Front End Loader	No	40		79.1	50.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)				Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Tractor	84.0	80.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	79.1	75.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	84.0	81.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 05/16/2021
Case Description: Site Prep

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Site Prep	Residential	65.0	60.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85.0	50.0	0.0	
Scraper	No	40	85.0	50.0	0.0	
Tractor	No	40	84.0	50.0	0.0	
Front End Loader	No	40	80.0	50.0	0.0	
Backhoe	No	40	80.0	50.0	0.0	

Results

Equipment	Calculated (dBA) Lmax	Leq	Noise Limits (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Noise Limit Exceedance (dBA) Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Grader	85.0	81.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	85.0	81.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	84.0	80.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	80.0	76.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	80.0	76.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	85.0	86.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 05/28/2021
Case Description: Building Construction

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Building Construction	Residential	65.0	60.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Crane	No	16		80.6	50.0	0.0
Generator	No	50		80.6	50.0	0.0
Front End Loader	No	40		79.1	50.0	0.0
Backhoe	No	40		77.6	50.0	0.0
Tractor	No	40	84.0		50.0	0.0
Welder / Torch	No	40		74.0	50.0	0.0
Man Lift	No	20		74.7	50.0	0.0

Results

Equipment	Calculated (dBA) Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq	Noise Limit Exceedance (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq
Crane	80.6	72.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Generator	80.6	77.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	79.1	75.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	84.0	80.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Welder / Torch	74.0	70.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Man Lift	74.7	67.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	84.0	83.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 05/16/2021
Case Description: Asphalt Paving

**** Receptor #1 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Asphalt Paving	Residential	65.0	60.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Drum Mixer	No	50		80.0	50.0	0.0
Paver	No	50		77.2	50.0	0.0
Roller	No	20		80.0	50.0	0.0
Backhoe	No	40		77.6	50.0	0.0
Front End Loader	No	40		79.1	50.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)				Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Drum Mixer	80.0	77.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Paver	77.2	74.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	80.0	73.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	79.1	75.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	80.0	81.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 05/28/2021
Case Description: Utility Trenching

**** Receptor #1 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Utility Tranching	Residential	65.0	60.0	55.0

Equipment

Description	Impact Device	Spec Usage (%)	Actual Lmax (dBA)	Receptor Lmax (dBA)	Estimated Distance (feet)	Shielding (dBA)
Tractor	No	40	84.0		50.0	0.0
Front End Loader	No	40		79.1	50.0	0.0
Backhoe	No	40		77.6	50.0	0.0
Excavator	No	40		80.7	50.0	0.0
Compactor (ground)	No	20		83.2	50.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)				Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Tractor	84.0	80.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Front End Loader	79.1	75.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Excavator	80.7	76.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compactor (ground)	83.2	76.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	84.0	83.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 05/16/2021
Case Description: Architectural Coating

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Architectural Coating	Residential	65.0	60.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Compressor (air)	No	40		77.7	50.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Compressor (air)	77.7	73.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	77.7	73.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Phase	Noise Level @ 50 ft	Residential Area to W	Residential Area to N
Distance		90	90
Demo	**86**	**81**	**81**

Phase	Noise Level @ 50 ft	Residential Area to W	Residential Area to N
Distance		200	165
Site Prep	**86**	74	76
Rough Grading	**87**	75	77
Fine Grading	**82**	70	72
Utility Trenching	**84**	72	74

Phase	Noise Level @ 50 ft	Residential Area to W	Residential Area to N
Distance		65	100
Building Construction	**84**	**82**	78
Arch Coating	**74**	71	68

Phase	Noise Level @ 50 ft	Residential Area to W	Residential Area to N
Distance		50	50
Paving	**81.8**	**81.800**	**81.800**

OPL-01	**Vibration @ 25 ft**	**Residential to north and east**
Phase 1		15
Vibratory Roller	0.21	0.45
Large Bulldozer	0.089	0.19
Caisson Drilling	0.089	0.19
Loaded Trucks	0.076	0.16
Jackhammer	0.035	0.08
Small Bulldozer	0.003	0.01
Small Bulldozer	0.05	0.11

OPL-01	**Vibration @ 25 ft**	**Residential**	**Residential**
Phase 1	VdB	95	210
Vibratory Roller	94	77	66
Large Bulldozer	87	70	59
Caisson Drilling	87	70	59
Loaded Trucks	86	69	58
Jackhammer	79	62	51
Small Bulldozer	58	41	30

TRAFFIC NOISE MODELING

OPL-01.0

Traffic Noise Calculations

	PM Peak hour volumes				dBA Increae	
Roadway Segment	Existing No Project	Existing Plus Project	Future No Project	Future Plus Project	Project Noise Increase	Cumulative Increase
Paramount Boulevard north of Washington Boulevard	1,975	1,988	2,085	2,098	0.0	0.3
Paramount Boulevard south of Washington Boulevard	2,233	2,246	2,330	2,343	0.0	0.2
Washington Boulevard east of Paramount Boulevard	3,022	3,081	3,138	3,197	0.1	0.2
Washington Boulevard west of Paramount Boulevard	3,414	3,447	3,545	3,578	0.0	0.2
Crossway Drive north of Washington Boulevard	294	294	301	301	0.0	0.1
Crossway Drive south of Washington Boulevard	550	550	566	566	0.0	0.1
Washington Boulevard east of Crossway Drive	2,818	2,877	2,927	2,986	0.1	0.3
Washington Boulevard west of Crossway Drive	2,730	2,789	2,836	2,895	0.1	0.3
Rosemeand Boulevard north of Coffman and Pico Road	2,464	2,484	2,576	2,596	0.0	0.2
Rosemeand Boulevard south of Coffman and Pico Road	2,418	2,438	2,528	2,548	0.0	0.2
Coffman and Pico Road east of Rosemeand Boulevard	49	49	50	50	0.0	0.1
Coffman and Pico Road west of Rosemeand Boulevard	125	125	130	130	0.0	0.2
Rosemead Boulevard north of Washington Boulevard	2,226	2,251	2,330	2,355	0.0	0.2
Rosemead Boulevard south of Washington Boulevard	2,192	2,212	2,299	2,319	0.0	0.2
Washington Boulevard east of Rosemeand Boulevard	2,526	2,559	2,622	2,655	0.1	0.2
Washington Boulevard west of Rosemeand Boulevard	2,556	2,592	2,657	2,693	0.1	0.2
					0.1	0.3