Noise Impact Assessment for the El Rancho High School Baseball Field Improvement Project

City of Pico Rivera, California

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September 2023

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LIST OF ACRONYMS AND ABBREVIATIONS

ADT	Average Daily Trips
Caltrans	California Department of Transportation
CNEL	Community Noise Equivalent Level
dB	Decibel
dBA	Decibel is A-weighted
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
Hz	Hertz
L_{dn}	Day-night average sound level
L_{eq}	Measure of ambient noise
L_{max}	The maximum A-weighted noise level during the measurement period.
L_{min}	The minimum A-weighted noise level during the measurement period.
NIOSH	National Institute for Occupational Safety and Health
OPR	Office of Planning and Research
OSHA	Federal Occupational Safety and Health Administration
PPV	Peak particle velocity
Project	El Rancho High School Baseball Field Improvement Project
RCNM	Roadway Construction Noise Model
RMS	Root mean square
STC	Sound Transmission Class
VdB	Vibration Velocity Level

1.0 INTRODUCTION

This report documents the results of a Noise Impact Assessment completed for the El Rancho High School Baseball Field Improvement Project (Project), which proposes renovations to the existing baseball field at the El Rancho High School campus in Pico Rivera, California. This report was prepared as a comparison of predicted Project noise levels to noise standards promulgated by the City of Pico Rivera General Plan Noise Element. The purpose of this report is to estimate Project-generated noise and to determine the level of impact the Project would have on the environment.

1.1 Project Location and Description

The existing El Rancho High School campus is located at 6501 Passons Boulevard in the City of Pico Rivera, California. Nestled between Loch Alene Avenue to the west, Balfour Street to the north, and Homebrook Street to the south, the school is predominately surrounded by residential and commercial office land uses. California Highway 605 is located approximately 5,000 feet east of the Project Site.

The Project is proposing the renovation of the existing baseball field on the campus. Specifically proposed improvements involve the reconfiguration of an existing baseball diamond, as well as other related improvements such as the installation of batting cages, field lighting, and foul ball netting. The improvements to the baseball diamond would not result in an increase of events, additional school sports programs or participants, or result in additional spectators beyond current conditions. For the purposes of this analysis, eight acres in total were estimated to be disturbed by these proposed improvements.

Location: C:\Users\agne\Desktop\AGNE ArcPro Figure Making Template - only use as template do not make changes to this file.aprx - Location Template (AGNE - 7/24/2023)

Map Date: 7/24/2023
Sources: ESRI 2023

Figure 1 - Project Location

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El Rancho Baseball Field Improvement Project, 2023-140

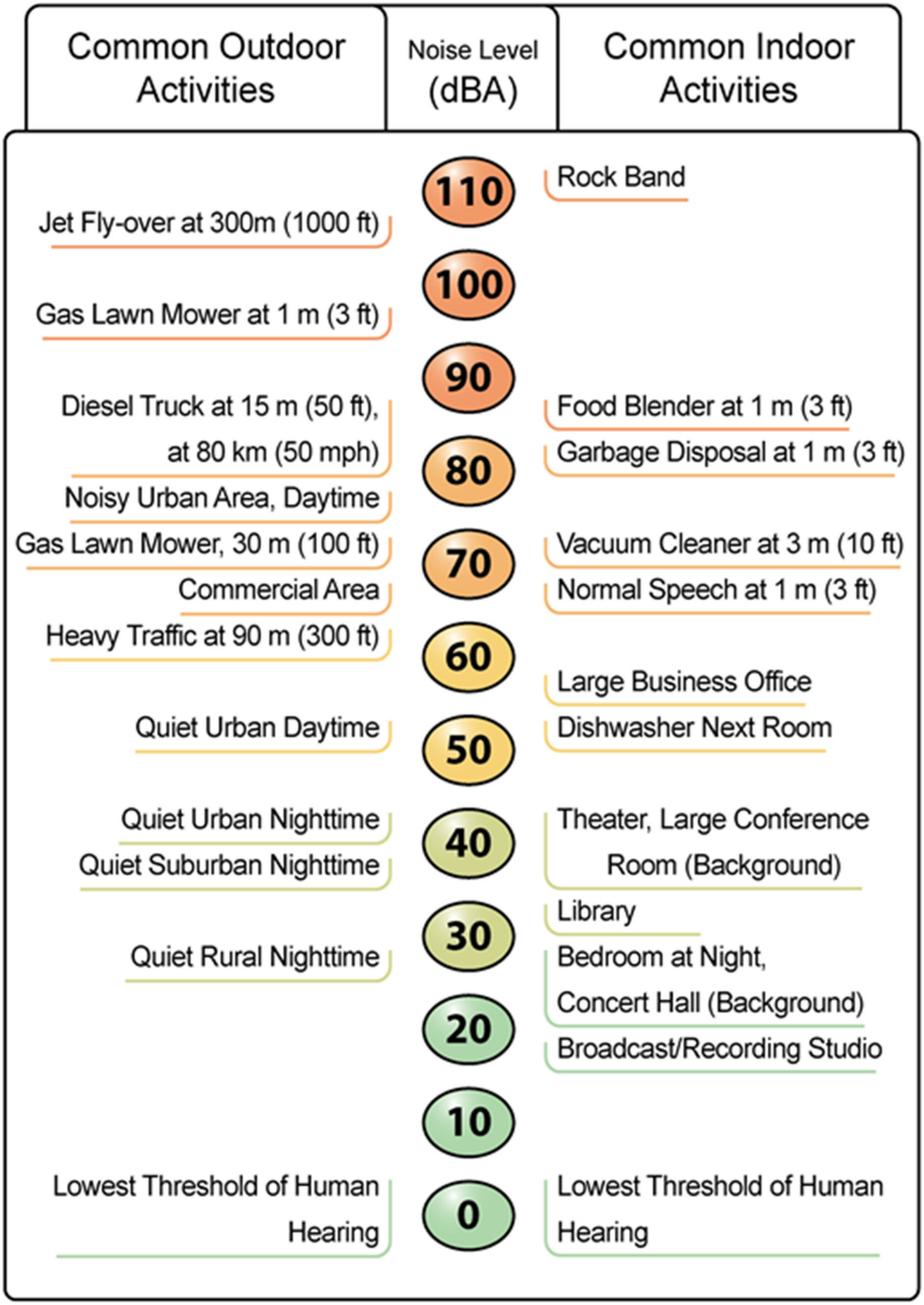
2.0 ENVIRONMENTAL NOISE AND GROUNDBORNE VIBRATION ANALYSIS

2.1 Fundamentals of Noise and Environmental Sound

2.1.1 Addition of Decibels

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

Typical noise levels associated with common noise sources are depicted in Figure 2-1.



Source: California Department of Transportation (Caltrans) 2020a

Figure 2-1. Common Noise Levels

2.1.2 Sound Propagation and Attenuation

Noise can be generated by a number of sources, including mobile sources such as automobiles, trucks and airplanes, and stationary sources such as construction sites, machinery, and industrial operations. Sound spreads (propagates) uniformly outward in a spherical pattern, and the sound level decreases (attenuates) at a rate of approximately 6 dB (dBA) for each doubling of distance from a stationary or point source (FHWA 2017). Sound from a line source, such as a highway, propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of approximately 3 dBA for each doubling of distance from a line source, such as a roadway, depending on ground surface characteristics (Federal Highway Administration [FHWA] 2017). 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 dBA per doubling of distance is normally assumed. For line sources, an overall attenuation rate of three dB per doubling of distance is assumed (FHWA 2011).

Noise levels may also be reduced by intervening structures; generally, a single row of detached buildings between the receptor and the noise source reduces the noise level by about five dBA (FHWA 2006), while a solid wall or berm generally reduces noise levels by 10 to 20 dBA (FHWA 2011). However, noise barriers or enclosures specifically designed to reduce site-specific construction noise can provide a sound reduction 35 dBA or greater (Western Electro-Acoustic Laboratory, Inc. 2013). To achieve the most potent noise-reducing effect, a noise enclosure/barrier must physically fit in the available space, must completely break the “line of sight” between the noise source and the receptors, must be free of degrading holes or gaps, and must not be flanked by nearby reflective surfaces. Noise barriers must be sizable enough to cover the entire noise source and extend lengthwise and vertically as far as feasibly possible to be most effective. The limiting factor for a noise barrier is not the component of noise transmitted through the material, but rather the amount of noise flanking around and over the barrier. In general, barriers contribute to decreasing noise levels only when the structure breaks the "line of sight" between the source and the receiver.

The manner in which older homes in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows (Caltrans 2002). The exterior-to-interior reduction of newer residential units is generally 30 dBA or more (Harris Miller, Miller & Hanson Inc. 2006). Generally, in exterior noise environments ranging from 60 dBA Community Noise Equivalent Level (CNEL) to 65 dBA CNEL, interior noise levels can typically be maintained below 45 dBA, a typical residential interior noise standard, with the incorporation of an adequate forced air mechanical ventilation system in each residential building, and standard thermal-pane residential windows/doors with a minimum rating of Sound Transmission Class (STC) 28. STC is an integer rating of how well a building partition attenuates airborne sound. In the U.S., it is widely used to rate interior partitions, ceilings, floors, doors, windows, and exterior wall configurations). In exterior noise environments of 65 dBA CNEL or greater, a combination of forced-air mechanical ventilation and sound-rated construction methods is often required to meet the interior noise level limit. Attaining the necessary noise reduction from exterior to interior spaces is readily achievable in noise environments less than 75 dBA CNEL with proper wall construction techniques following California Building Code methods, the selections of proper windows and doors, and the incorporation of forced-air mechanical ventilation systems.

2.1.3 Noise Descriptors

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Several rating scales have been developed to analyze the adverse effect of community noise on people. Because environmental noise fluctuates over time, these scales consider that the effect of noise on people is largely dependent on the total acoustical energy content of the noise, as well as the time of day when the noise occurs. The noise descriptors most often encountered when dealing with traffic, community, and environmental noise include the average hourly noise level (in L_{eq}) and the average daily noise levels/community noise equivalent level (in L_{dn}/CNEL). The L_{eq} is a measure of ambient noise, while the L_{dn} and CNEL are measures of community noise. Each is applicable to this analysis and defined as follows:

- **Equivalent Noise Level (L_{eq})** is 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.
- **Day-Night Average (L_{dn})** is a 24-hour average L_{eq} with a 10-dBA "weighting" added to noise during the hours of 10:00 pm to 7:00 am to account for noise sensitivity in the 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)** is a 24-hour average L_{eq} with a 5-dBA weighting during the hours of 7:00 pm to 10:00 pm and a 10-dBA weighting added to noise during the hours of 10:00 pm to 7:00 am to account for noise sensitivity in the evening and nighttime, respectively.

Table 2-1 provides a list of other common acoustical descriptors.

Table 2-1. Common Acoustical Descriptors	
Descriptor	**Definition**
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micropascals (or 20 micronewtons per square meter), where 1 pascal is the pressure resulting from a force of 1 newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micropascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hertz (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 sounds are below 20 Hz and ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high-frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average acoustic energy content of noise for a stated period of time. Thus, the 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.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn} or DNL	A 24-hour average 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 in the 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 p.m. to 10:00 p.m. and a 10 dBA “weighting” added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively. The logarithmic effect of these additions is that a 60 dBA 24-hour 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.
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.

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

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about ±1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends on the distance between the receptor and the noise source. Close to the noise source, the models are accurate to within about ±1 to 2 dBA.

2.1.4 Human Response to Noise

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

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

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

2.1.5 Effects of Noise on People

2.1.5.1 Hearing Loss

While physical damage to the ear from an intense noise impulse is rare, a degradation of auditory acuity can occur even within a community noise environment. Hearing loss occurs mainly due to chronic exposure to excessive noise but may be due to a single event such as an explosion. Natural hearing loss associated with aging may also be accelerated from chronic exposure to loud noise.

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

2.1.5.2 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.

2.2 Fundamentals of Environmental Groundborne Vibration

2.2.1 Vibration Sources and Characteristics

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

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

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

Table 2-2 displays the reactions of people and the effects on buildings produced by continuous vibration levels. The annoyance levels shown in the table should be interpreted with care since vibration may be found to be annoying at much lower levels than those listed, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. In high-noise environments, which are more prevalent where groundborne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

Ground vibration can be a concern in instances where buildings shake, and substantial rumblings occur. However, it is unusual for vibration from typical urban sources such as buses and heavy trucks to be perceptible. For instance, heavy-duty trucks generally generate groundborne vibration velocity levels of 0.006 PPV at 50 feet under typical circumstances, which as identified in Table 2-2 is considered very unlikely to cause damage to buildings of any type. Common sources for groundborne vibration are planes, trains, and construction activities such as earth-moving which requires the use of heavy-duty earth moving equipment.

Table 2-2. Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibration Levels

Peak Particle Velocity (inches/second)	Approximate Vibration Velocity Level (VdB)	Human Reaction	Effect on Buildings
0.006–0.019	64–74	Range of threshold of perception	Vibrations unlikely to cause damage of any type
0.08	87	Vibrations readily perceptible	Threshold at which there is a risk of architectural damage to extremely fragile buildings, historic buildings, ruins and ancient monuments
0.1	92	Level at which continuous vibrations may begin to annoy people, particularly those involved in vibration sensitive activities	Threshold at which there is a risk of architectural damage to fragile buildings. Virtually no risk of architectural damage to normal buildings
0.25	94	Vibrations may begin to annoy people in buildings	Threshold at which there is a risk of architectural damage to historic and some old buildings
0.3	96	Vibrations may begin to feel severe to people in buildings	Threshold at which there is a risk of architectural damage to older residential structures
0.5	103	Vibrations considered unpleasant by people subjected to continuous vibrations	Threshold at which there is a risk of architectural damage to new residential structures and Modern industrial/commercial buildings

Source: Caltrans 2020b

3.0 EXISTING ENVIRONMENTAL NOISE SETTING

3.1 Noise Sensitive Land Uses

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

3.1.1 Existing Ambient Noise Measurements

The Project Site is developed land surrounded mainly by residential and commercial land uses. In order to quantify existing ambient noise levels in the Project Area, ECORP Consulting, Inc. conducted five short-term noise measurements on the morning of August 23, 2022. These short-term noise measurements are representative of typical existing noise exposure within and immediately adjacent to the Project Site during the daytime (see Attachment A). The 15-minute measurements were taken between 10:26 a.m. and 11:52 a.m. The average noise levels of noise measured at each location are listed in Table 3-1.

Table 3-1. Existing (Baseline) Noise Measurements					
Location Number	**Location**	**L_{eq} dBA**	**L_{min} dBA**	**L_{max} dBA**	**Time**
1	Southeast sidewalk of Passons Boulevard; 100 feet north of Marjorie Street	**65.2 dBA**	46.9 dBA	85.4 dBA	10:26 a.m. – 10:41 a.m.
2	Northwest corner of Passons Boulevard and Balfour Street	**61.9 dBA**	42.4 dBA	79.3 dBA	10:44 a.m. – 10:59 a.m.
3	On Parkway at the southwest intersection of Balfour Street and Coolhurst Drive	**54.9 dBA**	41.7 dBA	74.4 dBA	11:01 a.m. – 11:16 a.m.
4	Northwest corner of Balfour Street and Lindsey Avenue	**55.3 dBA**	42.5 dBA	70.0 dBA	11:19 a.m. – 11:34 a.m.
5	Northeast sidewalk of Loch Alene Avenue; 500 feet north of Homebrook Avenue	**58.0 dBA**	40.3 dBA	75.9 dBA	11:37 a.m. – 11:52 a.m.

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

Notes: L_{eq} is 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. L_{min} is the minimum noise level during the measurement period and L_{max} is the maximum noise level during the measurement period.

As shown, the existing traffic-generated noise level on Project-vicinity roadways currently ranges from 54.9 to 65.2 dBA L_{eq}. The most common noise in the Project vicinity is produced by automotive vehicles (e.g., cars, trucks, buses, motorcycles) on area roadways.

4.0 REGULATORY FRAMEWORK

4.1 Federal

4.1.1 Occupational Safety and Health Act of 1970

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

4.1.2 National Institute of Occupational Safety and Health

A division of the US Department of Health and Human Services, the National Institute for Occupational Safety and Health (NIOSH) has established a construction-related noise level threshold as identified in the Criteria for a Recommended Standard: Occupational Noise Exposure prepared in 1998. NIOSH identifies a noise level threshold based on the duration of exposure to the source. The NIOSH construction-related noise level threshold starts at 85 dBA for more than 8 hours per day; for every 3-dBA increase, the exposure time is cut in half. This reduction results in noise level thresholds of 88 dBA for more than 4 hours per day, 92 dBA for more than 1 hour per day, 96 dBA for more than 30 minutes per day, and up to 100 dBA for more than 15 minutes per day. The intention of these thresholds is to protect people from hearing losses resulting from occupational noise exposure.

4.2 State

4.2.1 State of California General Plan Guidelines

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

4.2.2 State Office of Planning and Research Noise Element Guidelines

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

4.2.3 California Department of Transportation

In 2020, the California Department of Transportation (Caltrans) published the Transportation and Construction Vibration Manual (Caltrans 2020b). The manual provides general guidance on vibration issues associated with the construction and operation of projects concerning human perception and structural damage. Table 2-2 above presents recommendations for levels of vibration that could result in damage to structures exposed to continuous vibration.

4.3 Local

4.3.1 City of Pico Rivera General Plan Noise Element

The City of Pico Rivera's regulations with respect to noise are included in the Noise Element of the City's General Plan. The Noise Element seeks to preserve the well-being of the community and limit excessive and harmful noise levels. By addressing noise generating sources and implementing effective policies, the City can effectively promote the physical health, property values, and economic productivity of the city's residents and businesses. The Proposed Project would be subject to the following policies from the City's General Plan Noise Element:

> **Policy 11.1-1 Land Use Compatibility**. Strive to achieve and maintain land use patterns consistent with the noise compatibility guidelines set forth in the table below. [Table 4-1] presents exterior and interior noise standards for the various land use categories.

Table 4-1. City of Pico Rivera Noise Standards

Land Use Category	Exterior Noise Level	Interior Noise Level
Residential	65 dBA	45 dBA
Transient Lodging (Motels/Hotels)	65 dBA	45 dBA
Schools, Libraries, Churches, Hospitals/Medical Facilities, Nursing Homes, Museums	70 dBA	45 dBA
Theaters, Auditoriums	70 dBA	N/A
Playgrounds, Parks	75 dBA	N/A
Golf Courses, Riding Stables, Water Recreation	75 dBA	N/A
Office Buildings, Business Commercial, and Professional	70 dBA	N/A
Industrial; Manufacturing, and Utilities	75 dBA	N/A

Source: City of Pico Rivera General Plan Noise Element

Policy 11.3-1 Construction Noise. Construction-related noise and vibration should be minimized 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. Several construction noise requirements are listed below.

- 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 4.2].

Table 4-2. City of Pico Rivera 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 vibrations 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

Source: City of Pico Rivera General Plan Noise Element (2014); Federal Transit Administration (2006)

Notes: 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.

5.0 Impact Assessment

5.1 Thresholds of Significance

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

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

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

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

For purposes of this analysis, the City noise standards were used for evaluation of Project-related noise impacts. As previously stated, the Noise Element of the City's General Plan construction-related noise and vibration should be minimized by limiting construction activities within 500 feet of noise-sensitive uses to the hours of 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. In order to evaluate the potential health-related effects (physical damage to the ear and mental damage from lack of sleep or focus) from construction noise, construction equipment noise levels are calculated and compared against the construction-related noise level threshold established in the Criteria for a Recommended Standard: Occupational Noise Exposure prepared in 1998 by NIOSH, described above. Vibrational impacts associated with the Project's construction will be evaluated against the City's vibrational standards, as shown above in Table 4-2. Consistent with City noise standards, both Project traffic noise and Project on-site noise are evaluated against the City noise standards contained in Table 4-1.

5.2 Methodology

This analysis of the existing and future noise environments is based on empirical observations. Predicted construction noise levels were calculated utilizing the FHWA's Roadway Construction Noise Model (2006). Groundborne vibration levels associated with construction-related activities for the Project have been evaluated utilizing typical groundborne vibration levels associated with construction equipment. Potential groundborne vibration impacts related to structural damage and human annoyance were evaluated, taking into account the distance from construction activities to nearby structures and typically applied criteria for structural damage and human annoyance.

5.3 Impact Analysis

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

Onsite Construction Noise

Construction noise associated with the Proposed Project would be temporary and would vary depending on the specific nature of the activities being performed. Noise generated would primarily be associated with the operation of off-road equipment for onsite construction activities as well as construction vehicle traffic on area roadways. Construction noise typically occurs intermittently and varies depending on the nature or phase of construction (e.g., site preparation, excavation, paving). Noise generated by construction equipment, including earth movers, pile drivers, and portable generators, can reach high levels. Typical operating cycles for these types of construction equipment may involve one or two minutes of full power operation followed by three to four minutes at lower power settings. Other primary sources of acoustical disturbance would be random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts). During construction, exterior noise levels could negatively affect sensitive land uses in the vicinity of the construction site.

The nearest existing noise-sensitive land uses to the Project Site include single family residences north of the Project Site fronting Balfour Street, located 224 feet from where construction would be occurring. As previously stated, the Noise Element of the City's General Plan states that construction-related noise and vibration should be minimized 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. The Proposed Project would be subject to these limitations. The City does not promulgate a numeric threshold pertaining to the noise associated with construction. This is due to the fact that construction noise is temporary, short term, intermittent in nature, and would cease on completion of the Project. Additionally, construction would occur throughout the Project Site and would not be concentrated at one point.

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

It is acknowledged that the majority of construction equipment is not situated at any one location during construction activities, but rather spread throughout the Project Site and at various distances from sensitive receptors. Therefore, this analysis employs the FTA guidance for calculating construction noise, which recommends measuring construction noise produced by all construction equipment from the center of the Project Site (FTA 2018), which in this case is approximately 224 feet from the nearest sensitive receptor, the single-family residences north of the Project Site. The anticipated short-term construction noise levels generated for the necessary equipment is presented in Table 5-1.

Table 5-1. Construction Average (dBA) Noise Levels at Nearest Receptors

Equipment	Estimated Exterior Construction Noise Level @ Closest Noise Sensitive Receptor	Construction Noise Standard (dBA L_{eq})	Exceeds Standards?
Site Preparation	70.3 dBA	*85*	**No**
Grading	72.9 dBA	*85*	**No**
Building Construction, Paving, and Painting	74.6 dBA	*85*	**No**

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

Notes: Construction equipment used during construction derived from the California Emissions Estimator Model 2022.1. The California Emissions Estimator Model is designed to calculate air pollutant emissions from construction activity and contains default construction equipment and usage parameters for typical construction projects based on several construction surveys conducted in order to identify such parameters. Consistent with FTA recommendations for calculating construction noise, construction noise was measured from the center of the Project Site (FTA 2018), which is 224 feet from the nearest receptor. Construction, paving and painting are assumed to occur simultaneously.

L_{eq} = The equivalent energy noise level, is 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.

As shown in Table 5-1, Project construction does not have the potential to exceed the construction noise standard of 85 dBA construction noise standard during the site preparation, grading, building construction, paving, and architectural coating activities.

Offsite Construction Worker Traffic Noise

Project construction would result in additional traffic on adjacent roadways over the period that construction occurs. According to the California Emissions Estimator Model, which is used to predict the maximum number of construction-related vehicle trips traveling to and from the Project Site, the maximum number of construction related trips traveling to and from the Project Site during a single construction phase would not be expected to exceed 27 trips in total. According to Caltrans' *Technical Noise Supplement to the Traffic Noise Analysis Protocol* (2013), doubling of traffic on a roadway is required to result in an increase of 3 dB (outside of the laboratory, a 3- dBA change is considered a just-perceivable difference). The Project Site would be accessible from Passons Boulevard. According to the City's General Plan Circulation Element, Passons Boulevard is classified as a collector, which has a capacity of up to 25,000 average daily trips (ADT) depending on the number of lanes. As such, the Project's 27 construction trips would not result in the doubling of traffic on Passons Boulevard, and therefore its contribution to existing traffic noise would not be perceptible. Additionally, it is noted that construction is temporary, and these trips would cease upon completion of the Project.

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

As previously described, noise-sensitive land uses are locations where people reside or where the presence of unwanted sound could adversely affect the use of the land. Residences, schools, hospitals, guest lodging, libraries, and some passive recreation areas would each be considered noise-sensitive and may warrant unique measures for protection from intruding noise. The nearest existing noise-sensitive land uses to the Project are single family residences located north of the Project Site, fronting Balfour Street.

Operational Noise

The Project is proposing the renovations of the baseball field on the campus. Specifically, proposed improvements involve the reconfiguration of an existing baseball diamond, as well as other related improvements such as the installation of batting cages, field lighting, and foul ball netting.

With the exception of the batting cages, none of the proposed improvements would represent a new source of noise beyond current conditions. The improvements to the baseball diamond would not result in an increase of events, additional school sports programs or participants, or result in additional spectators beyond current conditions and thus can be expected to generate the same level of noise as currently generated. It is noted that the addition of field lighting would result in the capability for games to be held later into the evening. However, it is not expected for the field to be utilized past 8:00 p.m. Although the City does not have specific nighttime noise standards, the Proposed Project's operations would not influence the usual nighttime hours (10:00 p.m. to 7:00 a.m.) ambient noise levels. Nevertheless, since the baseball diamond is proposed to be reconfigured and sound sources could be relocated nearer to noise sensitive receptors, a change in the ambient noise environment could occur even though there would not be an increase of events, participates, or spectators beyond current conditions. Furthermore, the proposed batting cages would represent new sources of noise.

On-site Project daytime noise associated with the proposed new batting cages and the reconfigured baseball field have been calculated using the SoundPLAN 3D noise model. The modeling scenario accounts for baseball and batting cages activities, as well as other spring sports that could potentially be played simultaneously with baseball, such as softball and water polo/swim contests. The Project noise calculations used in this analysis are conservative in that they account for the active use of all these sources simultaneously, which is unlikely to occur. For instance, the predicted Project noise levels account for a baseball game, a softball game, operation of all the batting cages, and use of the swimming pools all at the same time. As previously described, noise levels may also be reduced by intervening structures. The existing wall traversing the northeastern boundary, estimated at six feet in height, has been included in the SoundPLAN modeling calculations.

Table 5-2 shows the predicted Project noise levels at 16 noise-sensitive locations in the Project vicinity, as predicted by SoundPLAN. These 16 noise-sensitive locations represent nearby residences of the high school. Additionally, a noise contour graphic (see Figure 5-1) has been prepared to provide a visual depiction of the predicted noise levels in the Project vicinity from Project operations.

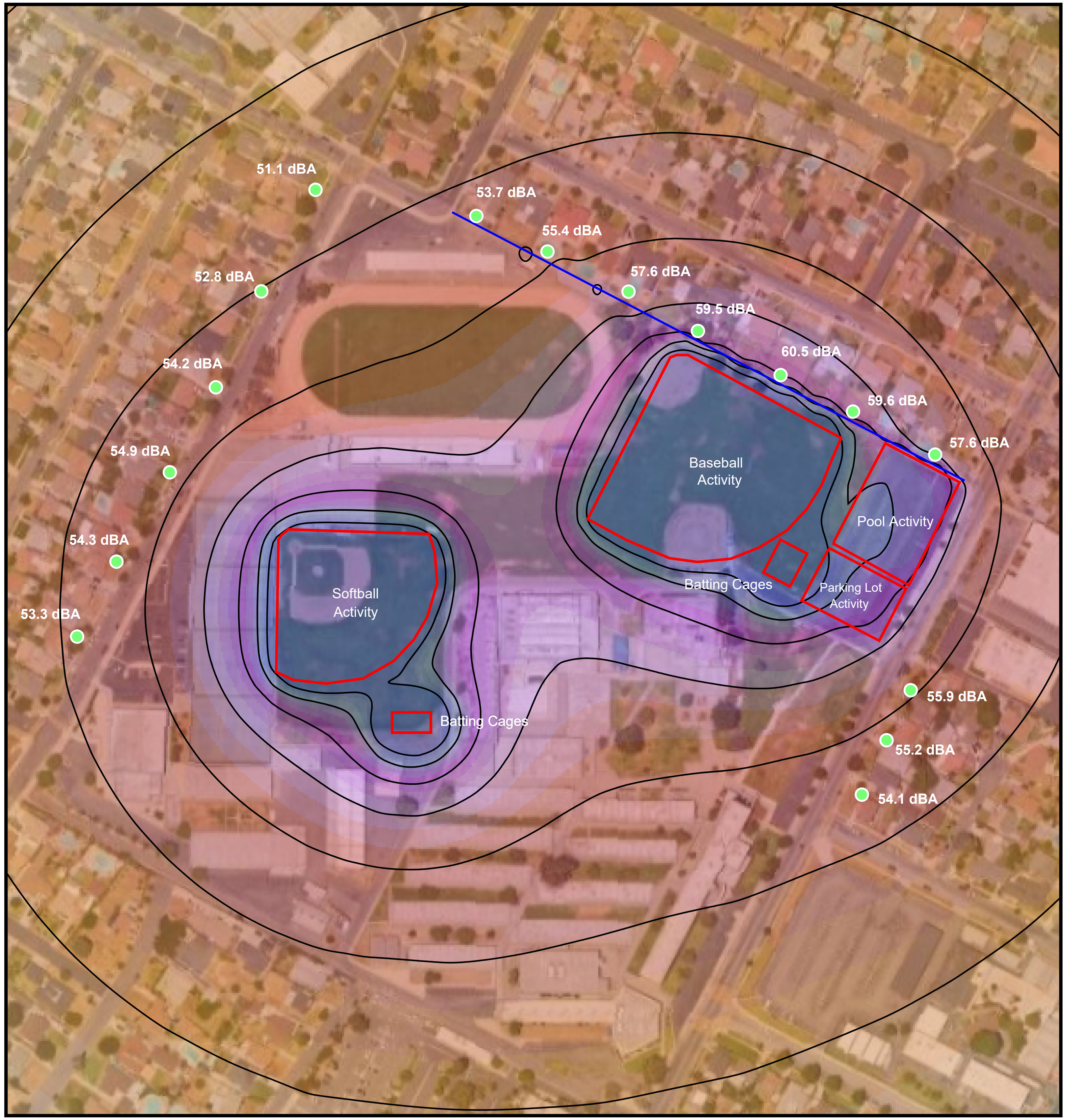
Table 5-2. Modeled Operational Daytime Noise Levels

Location	**Modeled Operational Noise Attributed to Project (dBA L_{eq})**	**City Exterior Noise Standards (dBA L_{eq})**	**Exceed Exterior Standard?**
#1	53.3 dBA	*65 dBA*	**No**
#2	54.3 dBA	*65 dBA*	**No**
#3	54.9 dBA	*65 dBA*	**No**
#4	54.2 dBA	*65 dBA*	**No**
#5	52.8 dBA	*65 dBA*	**No**
#6	51.1 dBA	*65 dBA*	**No**
#7	53.7 dBA	*65 dBA*	**No**
#8	55.4 dBA	*65 dBA*	**No**
#9	57.6 dBA	*65 dBA*	**No**
#10	59.5 dBA	*65 dBA*	**No**
#11	60.5 dBA	*65 dBA*	**No**
#12	59.6 dBA	*65 dBA*	**No**
#13	57.6 dBA	*65 dBA*	**No**
#14	55.9 dBA	*65 dBA*	**No**
#15	55.2 dBA	*65 dBA*	**No**
#16	54.1 dBA	*65 dBA*	**No**

Source: SounPLAN v 8.1. Refer to Attachment C for Model Data Outputs.

As shown in Table 5-2, Project operational noise would not exceed any exterior noise standards at any of the nearest noise-sensitive residential receptors (see Table 4-1 for City noise standards). Similarly, the Project would not exceed interior noise standards at any of the nearest noise-sensitive receptors. As previously described, the manner in which older homes in California were constructed generally provides a reduction of exterior-to-interior noise levels of about 20 to 25 dBA with closed windows (Caltrans 2002). The exterior-to-interior reduction of newer residential units is generally 30 dBA or more (Harris Miller, Miller & Hanson Inc. 2006). The least efficient exterior-to-interior noise attenuation of 20 dBA (Caltrans 2002) results in interior noise levels of 31.1 dBA to 40.5 dBA, which fall under the City's interior noise standard of

45 dBA for noise-sensitive residential receptors. It is assumed that all sports games will occur during usual daytime hours.



El Rancho High School Baseball Field Improvement Project

Project Noise
in dB(A)

Blue	>= 64
Light blue	61 - 64
Purple	58 - 61
Light purple	55 - 58
Red	52 - 55
Red	49 - 52
Orange	46 - 49
Light orange	43 - 46
Yellow	40 - 43
Light yellow	< 40

Legend
- Noise Activity
- Receiver
- Wall

N

Scale 1:263
0 50 100 200

Map Date: *7/18/2023*
Photo (or Base) Source: *SoundPLAN*

ECORP Consulting, Inc.
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Figure 5-1. Project Onsite Noise Contours

2023-140 El Rancho High School Baseball Field Improvement Project

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

Excessive groundborne vibration impacts result from continuously occurring vibration levels. Increases in groundborne vibration levels attributable to the Project would be primarily associated with short-term construction-related activities. Construction on the Project Site would have the potential to result in varying degrees of temporary groundborne vibration, depending on the specific construction equipment used and the operations involved. Ground vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance.

Construction-related ground vibration is normally associated with impact equipment such as pile drivers, jackhammers, and the operation of some heavy-duty construction equipment, such as dozers and trucks. It is not anticipated that pile drivers would be necessary during Project construction. Vibration decreases rapidly with distance, and it is acknowledged that construction activities would occur throughout the Project Site and would not be concentrated at the point closest to sensitive receptors. Groundborne vibration levels associated with construction equipment are summarized in Table 5-3.

Table 5-3. Representative Vibration Source Levels for Construction Equipment

Equipment Type	Receiver Vibration Decibels (VdB)
Large Bulldozer	87
Caisson Drilling	87
Loaded Trucks	86
Rock Breaker	87
Jackhammer	79
Small Bulldozer/Tractor	58
Vibratory Roller	94

Source: FTA 2018; Caltrans 2020b

The City of Pico Rivera's General Plan Noise Element includes Policy 11.3-2, *Vibration Standards*, which states that construction projects and new development anticipated to generate a significant amount of vibration are required to ensure acceptable interior vibration levels at nearby noise-sensitive uses based on Federal Transit Administration criteria, as outlined in Table 4-2.

It is acknowledged that construction activities would occur throughout the Project Site and would not be concentrated at the point closest to the nearest structure. Consistent with FTA recommendations for calculating construction vibration, construction vibration was measured from the center of the Project Site (FTA 2018). The nearest structure of concern to the construction site, with regard to groundborne vibrations, is a residence located on Balfour Street, approximately 224 feet from the center of the Project Site. In reference to Table 4-2, the land uses surrounding the Project Site can be considered Category 2 land use because they are residential. It is noted that this can be classified as *frequent* because although the construction is temporary, the construction's vibrational impacts will be consistent and frequent throughout the construction period. With a Category 2 and *frequent events* classification, the impact events cannot exceed 72 VdB without exceeding the significance threshold.

Based on the representative vibration levels presented for various construction equipment types in Table 5-3 and the construction vibration assessment methodology published by the FTA (2018), it is possible to estimate the potential Project construction vibration levels. The FTA provides the following equation:

$$[L_{v.distance} = L_{vref} - 30\log(D/25)]$$

Table 5-4 presents the expected Project related vibration levels at a distance of 224 feet.

Table 5-4. Construction Vibration Levels at 224 Feet

Receiver Vdb Levels[1]							Peak Vibration	Threshold	Exceed Threshold?
Large Bulldozer	Caisson Drilling	Loaded Trucks	Rock Breaker	Jackhammer	Small Bulldozer	Vibratory Roller			
58.4	58.4	57.4	58.4	50.4	29.4	65.4	**65.4**	*72*	**No**

[1]Based on the Vibration Source Levels of Construction Equipment included on Table 4-2 (FTA 2018).

As shown in Table 5-4, the peak vibration decibel level 224 feet away from construction equipment is 65.4 VdB. As previously mentioned, ground vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance. As a result, the residence located 224 feet away from the Project Site is calculated to experience vibrations below the City's threshold levels and therefore would not be negatively affected. Thus, Project construction would not exceed the recommended threshold.

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

The Project proposes improvements to the existing baseball field on campus. The improvements to baseball field and the addition of batting cages, field lighting, and foul ball netting would not result in groundborne vibrations during operations. Additionally, Project operations would not include the use of any large-scale stationary equipment that would result in excessive vibration levels. Therefore, the Project would not result groundborne vibration impacts during operations.

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

The Project Site is located approximately 10 miles southwest of the San Gabriel Valley Airport in El Monte and approximately 13 miles southeast of the Fullerton Municipal Airport, in Fullerton. According to the Los Angeles County Airport Land Use Commission and the Orange County Airport Land Use Commission, the Project Site is located outside of the noise contours of both San Gabriel Valley Airport and the Fullerton

Municipal Airport. Therefore, implementation of the Proposed Project would not result in increased exposure of people working at or visiting the Project Site to aircraft noise.

6.0 REFERENCES

Caltrans. 2020a. IS/EA Annotated Outline. http://www.dot.ca.gov/ser/vol1/sec4/ch31ea/chap31ea.htm.

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_____. 2006. Roadway Construction Noise Model.

FTA (Federal Transit Administration). 2018. Transit Noise and Vibration Impact Assessment.

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Western Electro-Acoustic Laboratory, Inc. 2013. Sound Transmission Loss Test Report No. TL 13-201.

LIST OF ATTACHMENTS

ATTACHMENT A

Baseline (Existing) Noise Measurements – Project Site and Vicinity

El Rancho HS Sports Field & Stadium

9/7/2022

- El Rancho HS POINT - El Rancho HS POINT
- World Imagery
- Low Resolution 15m Imagery
- High Resolution 60cm Imagery
- High Resolution 30cm Imagery
- Citations

1:4,514

0 0.03 0.06 0.12 mi

0 0.05 0.1 0.2 km

Esri Community Maps Contributors, County of Los Angeles, California State Parks, © OpenStreetMap, Microsoft, Esri, HERE, Garmin, SafeGraph, AGNE

Map Date: *9/07/2022*
Photo (or Base) Source: *ESRI Online 2022*

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Baseline Noise Measurement Locations

2023-140 El Rancho High School Baseball Field Improvement Project

Site Number: 1			
Recorded By: Lindsay Liegler			
Job Number: 2022-200			
Date: 8/23/2022			
Time: 10:26 – 10:41			
Location: East side of Passons Boulevard, on sidewalk. Approximately 1,000 meters north of Marjorie Street			
Source of Peak Noise: Vehicular Traffic on Passons Boulevard			
Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
65.2	46.9	85.4	104.2

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Larson Davis**	**LxT SE**	**0005120**	**11/29/2021**	
	Microphone	**Larson Davis**	**377B02**	**334361**	**11/30/2021**	
	Preamp	**Larson Davis**	**PRMLxT1L**	**042852**	**11/30/2021**	
	Calibrator	**Larson Davis**	**CAL200**	**14105**	**11/10/2021**	

Weather Data			
Est.	**Duration:** 15 minutes		**Sky:** Clear
	Note: dBA Offset = 0.02		**Sensor Height (ft):** 3.5 Feet
	Wind Ave Speed (mph)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	4 mph	74°F	29.81

Photo of Measurement Location

Measurement Report

Report Summary

Meter's File Name	LxT_Data.435.s	Computer's File Name	LxTse_0005120-20220823 102634-LxT_Data.435.ldbin
Meter	LxT SE 0005120		
Firmware	2.404		
User		Location	
Job Description			
Note			

Start Time	2022-08-23 10:26:34	Duration	0:15:00.0		
End Time	2022-08-23 10:41:34	Run Time	0:15:00.0	Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	65.2 dB		
LAE	94.8 dB	SEA	--- dB
EA	333.8 µPa²h		
LZ_{peak}	104.2 dB	2022-08-23 10:40:20	
LAS_{max}	85.4 dB	2022-08-23 10:40:20	
LAS_{min}	46.9 dB	2022-08-23 10:27:28	
LA_{eq}	65.2 dB		
LC_{eq}	71.8 dB	LC_{eq} - LA_{eq}	6.5 dB
LAI_{eq}	67.5 dB	LAI_{eq} - LA_{eq}	2.3 dB

Exceedances

Exceedances	Count	Duration
LAS > 85.0 dB	1	0:00:01.3
LAS > 115.0 dB	0	0:00:00.0
LZpeak > 135.0 dB	0	0:00:00.0
LZpeak > 137.0 dB	0	0:00:00.0
LZpeak > 140.0 dB	0	0:00:00.0

Community Noise

LDN	LDay	LNight	
65.2 dB	65.2 dB	0.0 dB	
LDEN	**LDay**	**LEve**	**LNight**
65.2 dB	65.2 dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	65.2 dB		71.8 dB		--- dB	
$Ls_{(max)}$	85.4 dB	2022-08-23 10:40:20	--- dB		--- dB	
$LS_{(min)}$	46.9 dB	2022-08-23 10:27:28	--- dB		--- dB	
$L_{Peak(max)}$	--- dB		--- dB		104.2 dB	2022-08-23 10:40:20

Overloads

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

Statistics

LAS 5.0	69.9 dB
LAS 10.0	68.1 dB
LAS 33.3	63.2 dB
LAS 50.0	60.1 dB
LAS 66.6	56.7 dB
LAS 90.0	50.6 dB

Site Number: 2			
Recorded By: Lindsay Liegler			
Job Number: 2022-200			
Date: 8/23/2022			
Time: 10:44 am – 10:59 am			
Location: Northwest corner of Passons Boulevard/Balfour Street Intersection			
Source of Peak Noise: Vehicular Traffic on Passons Boulevard and Balfour Street			
Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
61.9	42.4	79.3	102.2

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Larson Davis**	**LxT SE**	**0005120**	**11/29/2021**	
	Microphone	**Larson Davis**	**377B02**	**334361**	**11/30/2021**	
	Preamp	**Larson Davis**	**PRMLxT1L**	**042852**	**11/30/2021**	
	Calibrator	**Larson Davis**	**CAL200**	**14105**	**11/10/2021**	
Weather Data						
Est.	**Duration:** 15 minutes			**Sky:** Clear		
	Note: dBA Offset = 0.02			**Sensor Height (ft):** 3.5 Feet		
	Wind Ave Speed (mph)	**Temperature (degrees Fahrenheit)**		**Barometer Pressure (hPa)**		
	4 mph	76°F		29.81		

Photo of Measurement Location

Measurement Report

Report Summary

Meter's File Name	LxT_Data.436.s	Computer's File Name	LxTse_0005120-20220823 104438-LxT_Data.436.ldbin
Meter	LxT SE 0005120		
Firmware	2.404		
User		Location	
Job Description			
Note			

Start Time	2022-08-23 10:44:38	Duration	0:15:00.0		
End Time	2022-08-23 10:59:38	Run Time	0:15:00.0	Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	61.9 dB		
LAE	91.4 dB	SEA	--- dB
EA	154.7 µPa²h		
LZ_{peak}	102.2 dB	2022-08-23 10:44:52	
LAS_{max}	79.3 dB	2022-08-23 10:59:38	
LAS_{min}	42.4 dB	2022-08-23 10:56:21	
LA_{eq}	61.9 dB		
LC_{eq}	73.5 dB	LC_{eq} - LA_{eq}	11.6 dB
LAI_{eq}	64.0 dB	LAI_{eq} - LA_{eq}	2.2 dB

Exceedances

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

Community Noise

LDN	LDay	LNight	
61.9 dB	61.9 dB	0.0 dB	
LDEN	**LDay**	**LEve**	**LNight**
61.9 dB	61.9 dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	61.9 dB		73.5 dB		--- dB	
$Ls_{(max)}$	79.3 dB	2022-08-23 10:59:38	--- dB		--- dB	
$LS_{(min)}$	42.4 dB	2022-08-23 10:56:21	--- dB		--- dB	
$L_{Peak(max)}$	--- dB		--- dB		102.2 dB	2022-08-23 10:44:52

Overloads

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

Statistics

LAS 5.0	66.3 dB
LAS 10.0	63.7 dB
LAS 33.3	59.6 dB
LAS 50.0	57.5 dB
LAS 66.6	54.5 dB
LAS 90.0	49.4 dB

Site Number: 3			
Recorded By: Lindsay Liegler			
Job Number: 2022-200			
Date: 8/23/2022			
Time: 11:01 am – 11:16 am			
Location: Southwest corner of Balfour Street/Coolhurst Intersection			
Source of Peak Noise: Vehicular Traffic on Passons Boulevard and Balfour Street			
Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
54.9	41.7	74.4	94.6

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Larson Davis**	**LxT SE**	**0005120**	**11/29/2021**	
	Microphone	**Larson Davis**	**377B02**	**334361**	**11/30/2021**	
	Preamp	**Larson Davis**	**PRMLxT1L**	**042852**	**11/30/2021**	
	Calibrator	**Larson Davis**	**CAL200**	**14105**	**11/10/2021**	
Weather Data						
Est.	**Duration:** 15 minutes			**Sky:** Clear		
	Note: dBA Offset = 0.02			**Sensor Height (ft):** 3.5 Feet		
	Wind Ave Speed (mph)		**Temperature (degrees Fahrenheit)**		**Barometer Pressure (hPa)**	
	4 mph		77°F		29.81	

Photo of Measurement Location

Measurement Report

Report Summary

Meter's File Name	LxT_Data.437.s	Computer's File Name	LxTse_0005120-20220823 110149-LxT_Data.437.ldbin
Meter	LxT SE 0005120		
Firmware	2.404		
User		Location	
Job Description			
Note			

Start Time	2022-08-23 11:01:49	Duration	0:15:00.0		
End Time	2022-08-23 11:16:49	Run Time	0:15:00.0	Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	54.9 dB		
LAE	84.4 dB	SEA	--- dB
EA	30.9 µPa²h		
LZ_{peak}	94.6 dB	2022-08-23 11:10:21	
LAS_{max}	74.4 dB	2022-08-23 11:10:21	
LAS_{min}	41.7 dB	2022-08-23 11:12:43	
LA_{eq}	54.9 dB		
LC_{eq}	65.9 dB	LC_{eq} - LA_{eq}	11.0 dB
LAI_{eq}	59.4 dB	LAI_{eq} - LA_{eq}	4.5 dB

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

Community Noise	LDN	LDay	LNight	
	54.9 dB	54.9 dB	0.0 dB	
	LDEN	LDay	LEve	LNight
	54.9 dB	54.9 dB	--- dB	--- dB

Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	54.9 dB		65.9 dB		--- dB	
$Ls_{(max)}$	74.4 dB	2022-08-23 11:10:21	--- dB		--- dB	
$LS_{(min)}$	41.7 dB	2022-08-23 11:12:43	--- dB		--- dB	
$L_{Peak(max)}$	--- dB		--- dB		94.6 dB	2022-08-23 11:10:21

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

Statistics

LAS 5.0	59.9 dB
LAS 10.0	57.3 dB
LAS 33.3	51.7 dB
LAS 50.0	48.9 dB
LAS 66.6	46.6 dB
LAS 90.0	43.2 dB

Site Number: 4			
Recorded By: Lindsay Liegler			
Job Number: 2022-200			
Date: 8/23/2022			
Time: 11:19 am – 11:34 am			
Location: Northwest corner of Balfour Street/Lindsay Avenue Intersection			
Source of Peak Noise: Vehicular Traffic on Balfour Street and Lindsay Avenue. Distant Landscaping Equipment.			
Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
55.3	42.5	70.0	96.4

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Larson Davis**	**LxT SE**	**0005120**	**11/29/2021**	
	Microphone	**Larson Davis**	**377B02**	**334361**	**11/30/2021**	
	Preamp	**Larson Davis**	**PRMLxT1L**	**042852**	**11/30/2021**	
	Calibrator	**Larson Davis**	**CAL200**	**14105**	**11/10/2021**	

Weather Data			
Est.	**Duration:** 15 minutes		**Sky:** Clear
	Note: dBA Offset = 0.02		**Sensor Height (ft):** 3.5 Feet
	Wind Ave Speed (mph)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**
	4 mph	78°F	29.81

Photo of Measurement Location

Measurement Report

Report Summary

Meter's File Name	LxT_Data.438.s	Computer's File Name	LxTse_0005120-20220823 111946-LxT_Data.438.ldbin
Meter	LxT SE 0005120		
Firmware	2.404		
User		Location	
Job Description			
Note			

Start Time	2022-08-23 11:19:46	Duration	0:15:00.0		
End Time	2022-08-23 11:34:46	Run Time	0:15:00.0	Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	55.3 dB		
LAE	84.8 dB	SEA	--- dB
EA	33.9 µPa²h		
LZ_{peak}	96.4 dB	2022-08-23 11:34:09	
LAS_{max}	70.0 dB	2022-08-23 11:28:32	
LAS_{min}	42.5 dB	2022-08-23 11:26:54	
LA_{eq}	55.3 dB		
LC_{eq}	67.9 dB	LC_{eq} - LA_{eq}	12.6 dB
LAI_{eq}	57.5 dB	LAI_{eq} - LA_{eq}	2.2 dB

Exceedances

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

Community Noise

LDN	LDay	LNight	
55.3 dB	55.3 dB	0.0 dB	
LDEN	**LDay**	**LEve**	**LNight**
55.3 dB	55.3 dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	55.3 dB		67.9 dB		--- dB	
$Ls_{(max)}$	70.0 dB	2022-08-23 11:28:32	--- dB		--- dB	
$LS_{(min)}$	42.5 dB	2022-08-23 11:26:54	--- dB		--- dB	
$L_{Peak(max)}$	--- dB		--- dB		96.4 dB	2022-08-23 11:34:09

Overloads

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

Statistics

LAS 5.0	61.2 dB
LAS 10.0	57.9 dB
LAS 33.3	53.6 dB
LAS 50.0	51.5 dB
LAS 66.6	49.5 dB
LAS 90.0	44.3 dB

Site Number: 5			
Recorded By: Lindsay Liegler			
Job Number: 2022-200			
Date: 8/23/2022			
Time: 11: 37 am – 11:52 am			
Location: Northeast side of Loch Alene Avenue, on sidewalk. Approximately 500 feet north of Homebrook Street.			
Source of Peak Noise: Vehicular Traffic on Loch Alene Avenue. Distant overhead plane.			
Noise Data			
Leq (dB)	**Lmin (dB)**	**Lmax (dB)**	**Peak (dB)**
58.0	40.3	75.9	99.3

Equipment						
Category	**Type**	**Vendor**	**Model**	**Serial No.**	**Cert. Date**	**Note**
Sound	Sound Level Meter	**Larson Davis**	**LxT SE**	**0005120**	**11/29/2021**	
	Microphone	**Larson Davis**	**377B02**	**334361**	**11/30/2021**	
	Preamp	**Larson Davis**	**PRMLxT1L**	**042852**	**11/30/2021**	
	Calibrator	**Larson Davis**	**CAL200**	**14105**	**11/10/2021**	
Weather Data						
Est.	**Duration:** 15 minutes		**Sky:** Clear			
	Note: dBA Offset = 0.02		**Sensor Height (ft):** 3.5 Feet			
	Wind Ave Speed (mph)	**Temperature (degrees Fahrenheit)**	**Barometer Pressure (hPa)**			
	4 mph	79°F	29.81			

Photo of Measurement Location

Measurement Report

Report Summary

Meter's File Name	LxT_Data.439.s	Computer's File Name	LxTse_0005120-20220823 113735-LxT_Data.439.ldbin
Meter	LxT SE 0005120		
Firmware	2.404		
User		Location	
Job Description			
Note			

Start Time	2022-08-23 11:37:35	Duration	0:15:00.0		
End Time	2022-08-23 11:52:35	Run Time	0:15:00.0	Pause Time	0:00:00.0

Results

Overall Metrics

LA_{eq}	58.0 dB		
LAE	87.5 dB	SEA	--- dB
EA	62.8 µPa²h		
LZ_{peak}	99.3 dB	2022-08-23 11:40:34	
LAS_{max}	75.9 dB	2022-08-23 11:42:02	
LAS_{min}	40.3 dB	2022-08-23 11:51:12	
LA_{eq}	58.0 dB		
LC_{eq}	67.2 dB	$LC_{eq} - LA_{eq}$	9.2 dB
LAI_{eq}	61.3 dB	$LAI_{eq} - LA_{eq}$	3.3 dB

Exceedances

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

Community Noise

LDN	LDay	LNight	
58.0 dB	58.0 dB	0.0 dB	
LDEN	**LDay**	**LEve**	**LNight**
58.0 dB	58.0 dB	--- dB	--- dB

Any Data

	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	58.0 dB		67.2 dB		--- dB	
$Ls_{(max)}$	75.9 dB	2022-08-23 11:42:02	--- dB		--- dB	
$LS_{(min)}$	40.3 dB	2022-08-23 11:51:12	--- dB		--- dB	
$L_{Peak(max)}$	--- dB		--- dB		99.3 dB	2022-08-23 11:40:34

Overloads

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

Statistics

LAS 5.0	63.2 dB
LAS 10.0	60.0 dB
LAS 33.3	52.8 dB
LAS 50.0	48.5 dB
LAS 66.6	45.9 dB
LAS 90.0	43.5 dB

ATTACHMENT B

Federal Highway Administration Roadway Construction Noise Outputs

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/21/2023
Case Description: El Rancho Baseball Field Improvement - Site Preparation

Description	**Land Use**
Site Preparation	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Dozer	No	40		81.7	224	0
Tractor	No	40	84		224	0
Front End Loader	No	40		79.1	224	0
Backhoe	No	40		77.6	224	0

Results

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Dozer		68.6	64.7
Tractor		71	67
Front End Loader		66.1	62.1
Backhoe		64.5	60.6
	Total	71	70.3

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/21/2023
Case Description: El Rancho Baseball Field Improvement - Grading

Description	**Land Use**
Grading	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Grader	No	40	85		224	0
Excavator	No	40		80.7	224	0
Front End Loader	No	40		79.1	224	0
Backhoe	No	40		77.6	224	0
Tractor	No	40	84		224	0
Dozer	No	40		81.7	224	0

Results

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Grader		72	68
Excavator		67.7	63.7
Front End Loader		66.1	62.1
Backhoe		64.5	60.6
Tractor		71	67
Dozer		68.6	64.7
	Total	72	72.9

*Calculated Lmax is the Loudest value.

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 9/21/2023
Case Description: El Rancho Baseball Field Improvement - Construction, Paving, Coating

Description	**Land Use**
Construction, Paving, Coating	Residential

Description	**Impact Device**	**Usage(%)**	**Equipment Spec Lmax (dBA)**	**Actual Lmax (dBA)**	**Receptor Distance (feet)**	**Estimated Shielding (dBA)**
Gradall	No	40		83.4	224	0
Generator	No	50		80.6	224	0
Crane	No	16		80.6	224	0
Backhoe	No	40		77.6	224	0
Tractor	No	40	84		224	0
Front End Loader	No	40		79.1	224	0
Welder / Torch	No	40		74	224	0
Paver	No	50		77.2	224	0
Pavement Scarafier	No	20		89.5	224	0
Roller	No	20		80	224	0
Compressor (air)	No	40		77.7	224	0

Results

Calculated (dBA)

Equipment		***Lmax**	**Leq**
Gradall		70.4	66.4
Generator		67.6	64.6
Crane		67.5	59.6
Backhoe		64.5	60.6
Tractor		71	67
Front End Loader		66.1	62.1
Welder / Torch		61	57
Paver		64.2	61.2
Pavement Scarafier		76.5	69.5
Roller		67	60
Compressor (air)		64.6	60.7
	Total	76.5	74.6

*Calculated Lmax is the Loudest value.

ATTACHMENT C

SoundPLAN Onsite Noise Generation

SoundPLAN
Output Source Information

Number	Reciever Name	Location	Level at Ground Floor
1	Residential	On Loch Alene Avenue approximately 290 feet northeast from Homebrook Street. Across from School Parking Lot.	53.3 dBA
2	Residential	On Loch Alene Avenue approximately 500 feet northeast from Homebrook Street. Across from Northern-most School Pickelball Court.	54.3 dBA
3	Residential	On Loch Alene Avenue approximately 616 feet northeast from Homebrook Street. Across from Home Bleachers.	54.9 dBA
4	Residential	On Loch Alene Avenue approximately 755 feet northeast from Homebrook Street. Across from Football Stadium.	54.2 dBA
5	Residential	On Loch Alene Avenue approximately 920 feet northeast from Homebrook Street. Across from Football Stadium.	52.8 dBA
6	Residential	On Loch Alene Avenue approximately 1,115 feet northeast from Homebrook Street. Across from School Parking Lot North of Football Stadium. Last Residence on Loch Alene.	51.1 dBA
7	Residential	Fronting Balfour Street. Corner of Balfour Street and Lindsay Avenue	53.7 dBA
8	Residential	Fronting Balfour Street approximately 190 feet east of Lindsay Avenue.	55.4 dBA
9	Residential	Fronting Balfour Street approximately 370 feet east of Lindsay Avenue.	57.6 dBA
10	Residential	Fronting Balfour Street approximately 500 feet east of Lindsay Avenue. Northeast of Existing Baseball Field.	59.5 dBA
11	Residential	Fronting Balfour Street approximately 675 feet east of Lindsay Avenue and 400 feet west of Passons Boulevard.	60.5 dBA
12	Residential	Fronting Balfour Street approximately 850 feet east of Lindsay Avenue and 225 feet west of Passons Boulevard.	59.6 dBA
13	Residential	Fronting Balfour Street approximately 950 feet east of Lindsay Avenue and 125 feet west of Passons Boulevard. Northeast of Proposed Pool.	57.6 dBA
14	Residential	On Passons Boulevard approximately 560 feet southwest of Balfour Street and 300 feet northeast of Marjorie Street.	55.9 dBA
15	Residential	On Passons Boulevard approximately 650 feet southwest of Balfour Street and 210 feet northeast of Marjorie Street.	55.2 dBA
16	Residential	Corner of Passons Avenue and Marjorie Street.	54.1 dBA
Number	**Noise Source Information**	**Citation**	**Level at Source**
1	Parking Lot Activity	ECORP Consulting, Inc. Refrence Noise Measurment (Parking Lot Noise)	51.0 dBA
2	Sports Contests	ECORP Consulting, Inc. Refrence Noise Measurment (Softball Tournament)	66.0 dBA
3	Pool Activity	ECORP Consulting, Inc. Refrence Noise Measurment (Outdoor Recreational Pool)	54.9 dBA
5	Batting Cages	ECORP Consulting, Inc. Refrence Noise Measurment (Commercial Batting Cage)	75.2 dBA