

Pacific Village Platinum Campus Project

Noise Impact Study

City of San Bernardino, CA

Prepared for:

Ms. Kayti Christianson
Terracon
45 W Walnut Street
Avalon, CA 90704

Prepared by:

MD Acoustics, LLC
Rachel Edelman
Claire Pincock, INCE-USA
1197 Los Angeles Ave, Ste C-256
Simi Valley, CA 93065

Date: 5/30/2024



Noise Study Reports | Vibration Studies | Air Quality | Greenhouse Gas | Health Risk Assessments

P) AZ - 602.774.1950

P) CA - 805.426.4477

www.mdacoustics.com
info@mdacoustics.com

TABLE OF CONTENTS

1.0	Introduction	1
1.1	Purpose of Analysis and Study Objectives	1
1.2	Site Location and Study Area	1
1.3	Proposed Project Description	1
2.0	Fundamentals of Noise	5
2.1	Sound, Noise and Acoustics	5
2.2	Frequency and Hertz	5
2.3	Sound Pressure Levels and Decibels	5
2.4	Addition of Decibels	5
2.5	Human Response to Changes in Noise Levels	6
2.6	Noise Descriptors	6
2.7	Traffic Noise Prediction	7
2.8	Sound Propagation	8
3.0	Ground-Bourne Vibration Fundamentals.....	9
3.1	Vibration Descriptors	9
3.2	Vibration Perception	9
4.0	Regulatory Setting.....	10
4.1	Federal Regulations	10
4.2	State Regulations	10
4.3	City of San Bernardino Noise Regulations	11
4.4	City of Highland Noise Regulations	13
4.5	CEQA Guidelines	14
5.0	Study Method and Procedure.....	15
5.1	Noise Measurement Procedure and Criteria	15
5.2	Noise Measurement Locations	15
5.3	FHWA Traffic Noise Prediction Model	15
5.4	SoundPLAN Noise Model (Operational Noise)	16
6.0	Existing Noise Environment	19
6.1	Short-Term Noise Measurement Results	19
7.0	Future Noise Environment Impacts and Mitigation	20
7.1	Future Off-Site Exterior Noise	20
7.1.1	Future Off-Site Traffic Noise Impact	20
7.1.2	Noise Impacts to Off-Site Receptors Due to Stationary Sources	21
7.2	Noise Impacts to On-Site Receptors Due to Traffic Error! Bookmark not defined.	
8.0	Construction Noise Impact	24
8.1	Construction Noise	24
8.2	Construction Vibration	25
8.3	Construction Noise Reduction Policies	27

9.0	CEQA Analysis	28
10.0	References	30

LIST OF APPENDICES

Appendix A:	Photographs and Field Measurement Data.....	1
Appendix B:	Traffic Noise Modeling Output	2
Appendix C:	Reference Data.....	3
Appendix D:	SoundPLAN Inputs/Outputs.....	4
Appendix E:	Construction Noise Modeling Output.....	5

LIST OF EXHIBITS

Exhibit A:	Location Map	3
Exhibit B:	Site Plan.....	4
Exhibit C:	Typical A-Weighted Noise Levels	5
Exhibit D:	Land Use Compatibility Guidelines	11
Exhibit E:	Measurements Locations.....	18
Exhibit F:	Operational Noise Levels	23

LIST OF TABLES

Table 1:	Roadway Parameters and Vehicle Distribution	16
Table 2:	Short-Term Noise Measurement Data ¹	19
Table 3:	Existing/Existing + Project Scenario – Noise Levels Along Roadways (dBA CNEL).....	20
Table 4:	Worst-case Predicted Operational Leq Noise Level.....	21
Table 5:	Typical Construction Noise Levels ¹	24
Table 6:	Construction Noise Levels East Property Line.....	25
Table 7:	Guideline Vibration Damage Potential Threshold Criteria	26
Table 8:	Vibration Source Levels for Construction Equipment ¹	26

1.0 Introduction

1.1 Purpose of Analysis and Study Objectives

This noise assessment was prepared to evaluate the potential noise impacts for the project study area and to recommend noise mitigation measures, if necessary, to minimize the potential noise impacts. The assessment was conducted and compared to the noise standards set forth by the Federal, State and Local agencies. Consistent with the City's Noise Guidelines, the project must demonstrate compliance to the applicable noise criterion as outlined within the City's Noise Element and Municipal Code.

The following is provided in this report:

- A description of the study area and the proposed project
- Information regarding the fundamentals of noise
- A description of the local noise guidelines and standards
- An analysis of traffic noise impacts to and from the project site
- An analysis of construction noise impacts

1.2 Site Location and Study Area

The project site is located at 2626 Pacific Street at the intersection of Valeria Drive and Pacific Street in the City of San Bernardino, California, as shown in Exhibit A. The site comprises Accessor Parcel Numbers (APNs) 119114136, 119114137, 119114138, 119114140, and 119114142. Land zoning surrounding the site includes residential suburban to the south, public park to the west, single-family residential to the north, and planned development to the east. Land zoning north and east of the site is within the City of Highland's boundaries, and project noise must comply with the City of Highland's regulations at those locations. Pacific Street is to the south, and Valeria Drive is to the west.

1.3 Proposed Project Description

The project proposes the improvement and expansion of the Pacific Village Platinum Campus. The County intends to develop this site into a full-service Continuum of Care (CoC) Campus to promote community health and expand housing options for their most vulnerable residents. The Project includes an array of affordable housing typologies providing access to affordable temporary, supportive, and permanent housing options with on-site services (Kitchell, 2023). The Project consists of new Homekey housing units for Community Development Housing (CDH), permanent supportive housing for the Department of Aging and Adult Services (DAAS), a Recuperative Care Center (RCC), and Substance Use Disorder and Recovery (SUD) facilities. The total number of housing units is 58 with 28 for CDH and 30 for DAAS. In addition, new fencing and gates will be installed, covered courtyard gathering spaces, laundry facility, open courtyard seating, intimate gathering areas, and bio retention basins. For pets there will be a dog kennel, small dog park, and large dog park, as well as a pet relief area. Eight 4x4 storage units will be located next to the RCC and dog park.

There are approximately 28 residents that live at Pacific Village currently. The existing campus includes a single-family home, multi-family apartment building, temporary housing units (20 mobile trailers),

administration building, cafeteria, on-site laundry facility, and chapel building. The campus also currently includes an outdoor pet area, park-like landscaping, multiple outdoor gathering areas, and perimeter fencing with guarded main entrance and electronic-controlled exit gates.

Demolition of the site includes removal of concrete pavement sidewalk, landscaping, retaining wall, fencing, various curbs, and gutters, storm drain facilities, and water, irrigation, and electrical for improvements. One accessory shade structure will be demolished. All other existing facilities will be remodeled with no expansion to the existing footprint.

The proposed site plan is illustrated in Exhibit B. This study assesses the operational noise and traffic noise to and from the project site and compares the results to the applicable City noise standards.

Exhibit A Location Map



2.0 Fundamentals of Noise

This section of the report provides basic information about noise and presents some of the terms used within the report.

2.1 Sound, Noise and Acoustics

Sound is a disturbance created by a moving or vibrating source and is capable of being detected by the hearing organs. Sound may be thought of as mechanical energy of a moving object transmitted by pressure waves through a medium to a human ear. For traffic, or stationary noise, the medium of concern is air. *Noise* is defined as sound that is loud, unpleasant, unexpected, or unwanted.

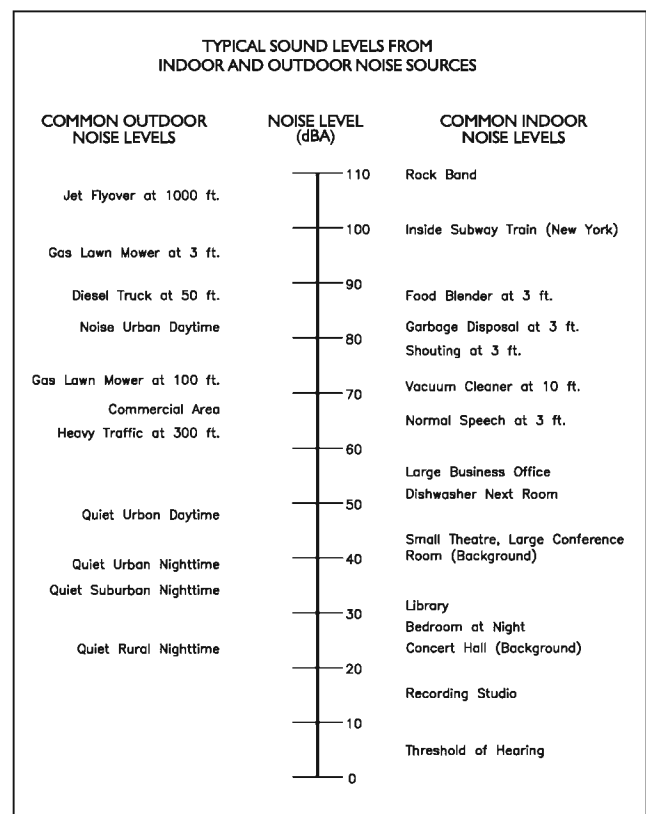
2.2 Frequency and Hertz

A continuous sound is described by its *frequency* (pitch) and its *amplitude* (loudness). Frequency relates to the number of pressure oscillations per second. Low-frequency sounds are low in pitch (bass sounding) and high-frequency sounds are high in pitch (squeak). These oscillations per second (cycles) are commonly referred to as Hertz (Hz). The human ear can hear from the bass pitch starting out at 20 Hz all the way to the high pitch of 20,000 Hz.

2.3 Sound Pressure Levels and Decibels

The *amplitude* of a sound determines its loudness. The loudness of sound increases or decreases as the amplitude increases or decreases. Sound pressure amplitude is measured in units of micro-Newton per square meter (N/m²), also called micro-Pascal (μPa). One μPa is approximately one hundred billionths (0.0000000001) of normal atmospheric pressure. Sound pressure level (SPL or L_p) is used to describe in logarithmic units the ratio of actual sound pressures to a reference pressure squared. These units are called decibels abbreviated dB. Exhibit C illustrates reference sound levels for different noise sources.

Exhibit C: Typical A-Weighted Noise Levels



2.4 Addition of Decibels

Because decibels are on a logarithmic scale, sound pressure levels cannot be added or subtracted by simple plus or minus addition. When two sounds of equal SPL are combined, they will produce an SPL 3 dB greater than the original single SPL. In other words, sound energy must be doubled to produce a 3 dB increase. If two sounds differ by approximately 10 dB, the higher sound level is the predominant sound.

2.5 Human Response to Changes in Noise Levels

In general, the healthy human ear is most sensitive to sounds between 1,000 Hz and 5,000 Hz, (A-weighted scale) and it perceives a sound within that range as being more intense than a sound with a higher or lower frequency with the same magnitude. For purposes of this report as well as with most environmental documents, the A-scale weighting is typically reported in terms of A-weighted decibel (dBA). Typically, the human ear can barely perceive the change in noise level of 3 dB. A change in 5 dB is readily perceptible, and a change in 10 dB is perceived as being twice or half as loud. As previously discussed, a doubling of sound energy results in a 3 dB increase in sound, which means that a doubling of sound energy (e.g. doubling the volume of traffic on a highway) would result in a barely perceptible change in sound level.

Changes in Intensity Level, dBA	Changes in Apparent Loudness
1	Not perceptible
3	Just perceptible
5	Clearly noticeable
10	Twice (or half) as loud

https://www.fhwa.dot.gov/environment/noise/regulations_and_guidance/polguide/polguide02.cfm

2.6 Noise Descriptors

Noise in our daily environment fluctuates over time. Some noise levels occur in regular patterns, others are random. Some noise levels are constant while others are sporadic. Noise descriptors were created to describe the different time-varying noise levels.

A-Weighted Sound Level: The sound pressure level in decibels as measured on a sound level meter using the A-weighted 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 response of the human ear. A numerical method of rating human judgment of loudness.

Ambient Noise Level: The composite of noise from all sources, near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location.

Community Noise Equivalent Level (CNEL): The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of five (5) decibels to sound levels in the evening from 7:00 to 10:00 PM and after addition of ten (10) decibels to sound levels in the night before 7:00 AM and after 10:00 PM.

Decibel (dB): A unit for measuring the amplitude of a 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, which is 20 micro-pascals.

dB(A): A-weighted sound level (see definition above).

Equivalent Sound Level (LEQ): The sound level corresponding to a steady noise level over a given sample period with the same amount of acoustic energy as the actual time varying noise level. The energy average noise level during the sample period.

Habitable Room: Any room meeting the requirements of the Uniform Building Code or other applicable regulations which is intended to be used for sleeping, living, cooking or dining purposes, excluding such enclosed spaces as closets, pantries, bath or toilet rooms, service rooms, connecting corridors, laundries, unfinished attics, foyers, storage spaces, cellars, utility rooms and similar spaces.

L(n): The A-weighted sound level exceeded during a certain percentage of the sample time. For example, L10 in the sound level exceeded 10 percent of the sample time. Similarly L50, L90 and L99, etc.

Noise: Any unwanted sound or sound which is undesirable because it interferes with speech and hearing, or is intense enough to damage hearing, or is otherwise annoying. The State Noise Control Act defines noise as "...excessive undesirable sound...".

Outdoor Living Area: Outdoor spaces that are associated with residential land uses typically used for passive recreational activities or other noise-sensitive uses. Such spaces include patio areas, barbecue areas, jacuzzi areas, etc. associated with residential uses; outdoor patient recovery or resting areas associated with hospitals, convalescent hospitals, or rest homes; outdoor areas associated with places of worship which have a significant role in services or other noise-sensitive activities; and outdoor school facilities routinely used for educational purposes which may be adversely impacted by noise. Outdoor areas usually not included in this definition are: front yard areas, driveways, greenbelts, maintenance areas and storage areas associated with residential land uses; exterior areas at hospitals that are not used for patient activities; outdoor areas associated with places of worship and principally used for short-term social gatherings; and, outdoor areas associated with school facilities that are not typically associated with educational uses prone to adverse noise impacts (for example, school play yard areas).

Percent Noise Levels: See L(n).

Sound Level (Noise Level): The weighted sound pressure level obtained by use of a sound level meter having a standard frequency-filter for attenuating part of the sound spectrum.

Sound Level Meter: An instrument, including a microphone, an amplifier, an output meter, and frequency weighting networks for the measurement and determination of noise and sound levels.

Single Event Noise Exposure Level (SENEL): The dB(A) level which, if it lasted for one second, would produce the same A-weighted sound energy as the actual event.

2.7 Traffic Noise Prediction

Noise levels associated with traffic depends on a variety of factors: (1) volume of traffic, (2) speed of traffic, (3) auto, medium truck (2–3 axle) and heavy truck percentage (4 axle and greater), and sound propagation. The greater the volume of traffic, higher speeds and truck percentages equate to a louder volume in noise. A doubling of the Average Daily Traffic (ADT) along a roadway will increase noise levels by approximately 3 dB; reasons for this are discussed in the sections above.

2.8 Sound Propagation

As sound propagates from a source it spreads geometrically. Sound from a small, localized source (i.e., a point source) radiates uniformly outward as it travels away from the source in a spherical pattern. The sound level attenuates at a rate of 6 dB per doubling of distance. The movement of vehicles down a roadway makes the source of the sound appear to propagate from a line (i.e., line source) rather than a point source. This line source results in the noise propagating from a roadway in a cylindrical spreading versus a spherical spreading that results from a point source. The sound level attenuates for a line source at a rate of 3 dB per doubling of distance.

As noise propagates from the source, it is affected by the ground and atmosphere. Noise models use hard site (reflective surfaces) and soft site (absorptive surfaces) to help calculate predicted noise levels. Hard site conditions assume no excessive ground absorption between the noise source and the receiver. Soft site conditions such as grass, soft dirt or landscaping attenuate noise at a rate of 1.5 dB per doubling of distance. When added to the geometric spreading, the excess ground attenuation results in an overall noise attenuation of 4.5 dB per doubling of distance for a line source and 7.5 dB per doubling of distance for a point source.

Research has demonstrated that atmospheric conditions can have a significant effect on noise levels when noise receivers are located 200 feet from a noise source. Wind, temperature, air humidity and turbulence can further impact how far sound can travel.

3.0 Ground-Borne Vibration Fundamentals

3.1 Vibration Descriptors

Ground-borne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. The effects of ground-borne vibrations typically only cause a nuisance to people, but at extreme vibration levels, damage to buildings may occur. Although ground-borne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. Ground-borne noise is an effect of ground-borne vibration and only exists indoors, since it is produced from noise radiated from the motion of the walls and floors of a room and may also consist of the rattling of windows or dishes on shelves.

Several different methods are used to quantify vibration amplitude.

PPV – Known as the peak particle velocity (PPV) which is the maximum instantaneous peak in vibration velocity, typically given in inches per second.

RMS – Known as root mean squared (RMS) can be used to denote vibration amplitude

VdB – A commonly used abbreviation to describe the vibration level (VdB) for a vibration source.

3.2 Vibration Perception

Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. These continuous vibrations are not noticeable to humans whose threshold of perception is around 65 VdB. Outdoor sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible ground-borne noise or vibration. To counter the effects of ground-borne vibration, the Federal Transit Administration (FTA) has published guidance relative to vibration impacts. According to the FTA, fragile buildings can be exposed to ground-borne vibration levels of 0.3 inches per second without experiencing structural damage.

There are three main types of vibration propagation: surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wave front, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wave front. However, unlike P-waves, the particle motion is transverse, or side-to-side and perpendicular to the direction of propagation. As vibration waves propagate from a source, the vibration energy decreases in a logarithmic nature and the vibration levels typically decrease by 6 VdB per doubling of the distance from the vibration source. As stated above, this drop-off rate can vary greatly depending on the soil but has been shown to be effective enough for screening purposes, in order to identify potential vibration impacts that may need to be studied through actual field tests

4.0 Regulatory Setting

The proposed project is located in the City of San Bernardino and noise regulations are addressed through the efforts of various federal, state and local government agencies. The agencies responsible for regulating noise are discussed below.

4.1 Federal Regulations

The adverse impact of noise was officially recognized by the federal government in the Noise Control Act of 1972, which serves three purposes:

- Publicize noise emission standards for interstate commerce
- Assist state and local abatement efforts
- Promote noise education and research

The Federal Office of Noise Abatement and Control (ONAC) originally was tasked with implementing the Noise Control Act. However, it was eventually eliminated leaving other federal agencies and committees to develop noise policies and programs. Some examples of these agencies are as follows: The Department of Transportation (DOT) assumed a significant role in noise control through its various agencies. The Federal Aviation Agency (FAA) is responsible to regulate noise from aircraft and airports. The Federal Highway Administration (FHWA) is responsible to regulate noise from the interstate highway system. The Occupational Safety and Health Administration (OSHA) is responsible for the prohibition of excessive noise exposure to workers.

The federal government advocates that local jurisdiction use their land use regulatory authority to arrange new development in such a way that “noise sensitive” uses are either prohibited from being constructed adjacent to a highway or, or alternatively that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

Since the federal government has preempted the setting of standards for noise levels that can be emitted by the transportation source, the City is restricted to regulating the noise generated by the transportation system through nuisance abatement ordinances and land use planning.

4.2 State Regulations

Established in 1973, the California Department of Health Services Office of Noise Control (ONC) was instrumental in developing regulatory tools to control and abate noise for use by local agencies. One significant model is the “Land Use Compatibility for Community Noise Environments Matrix.” The matrix allows the local jurisdiction to clearly delineate compatibility of sensitive uses with various incremental levels of noise.

The State of California has established noise insulation standards as outlined in Title 24, the California Building Code, which in some cases requires acoustical analyses to outline exterior noise levels and to ensure interior noise levels do not exceed the interior threshold. The State mandates that the legislative body of each county and city adopt a noise element as part of its comprehensive general plan. The local

noise element usually recognizes the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable, as illustrated in Exhibit D.

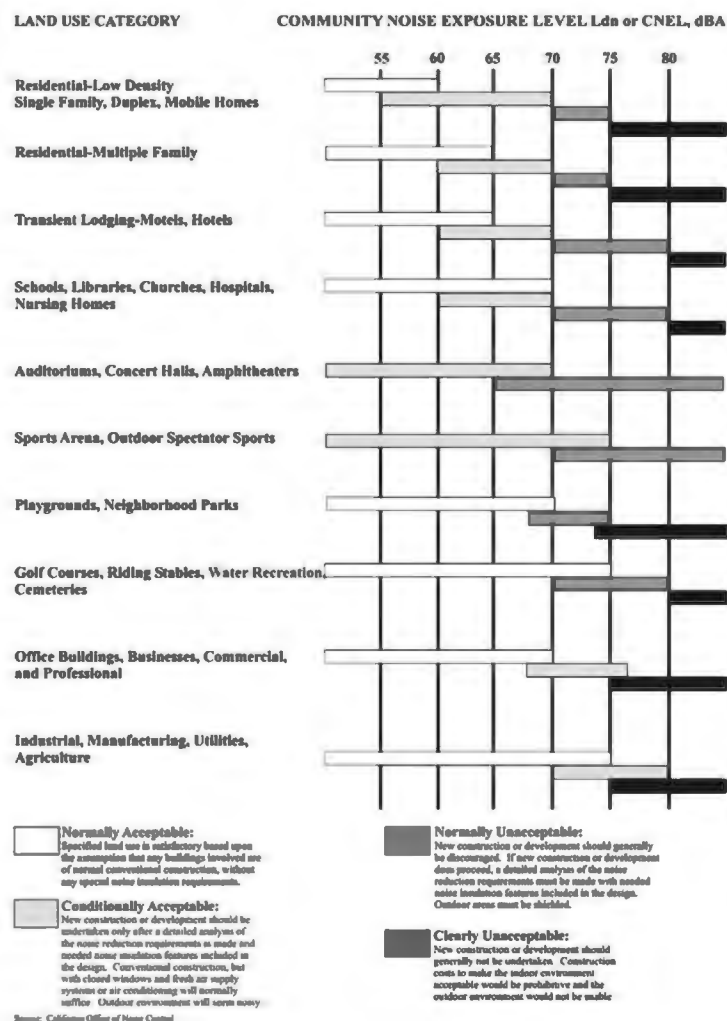
4.3 City of San Bernardino Noise Regulations

The City of San Bernardino outlines its noise regulations and standards within the Noise Element from the General Plan and the Noise Ordinance from the Municipal Code.

City of San Bernardino General Plan

Applicable policies and standards governing environmental noise in the City are set forth in the General Plan's Noise Element. Figure N-1 (Exhibit D of this report) of the City's Noise Element outlines the exterior transportation noise standards for community noise environments.

Exhibit D: Land Use Compatibility Guidelines



In addition to the noise standards, the City has outlined goals and policies to reduce potential noise impacts, which are presented below:

Goals and Policies

Goals and policies from the Noise Element that would mitigate potential impacts on noise include the following.

Goal 14.1: Ensure that residents are protected from excessive noise through careful land planning.

Policy 14.1.1: Minimize, reduce, or prohibit, as may be required, the new development of housing, health care facilities, schools, libraries, religious facilities, and other noise sensitive uses in areas where existing or future noise levels exceed an Ldn of 65 dB(A) exterior and an Ldn of 45 dB(A) interior if the noise cannot be reduced to these levels. (LU-1)

Policy 14.1.4: Prohibit the development of new or expansion of existing industrial, commercial, or other uses that generate noise impacts on housing, schools, health care facilities or other sensitive uses above a Ldn of 65 dB(A). (LU-1).

Goal 14.2: Ensure that residents are protected from excessive noise through careful land planning.

Policy 14.2.3: Require that development that increases the ambient noise level adjacent to noise-sensitive land uses provide appropriate mitigation measures. (LU-1)

Policy 14.2.17: Ensure that new development is compatible with the noise compatibility criteria and noise contours as defined in the Comprehensive Land Use Plan for the SBIA and depicted in Figure LU-4.

Policy 14.2.19: As may be necessary, require acoustical analysis and ensure the provision of effective noise mitigation measures for sensitive land uses, especially residential uses, in areas significantly impacted by noise.

Goal 14.3: Protect residents from the negative effects of “spill over” or nuisance noise.

Policy 14.3.1: Require that construction activities adjacent to residential units be limited as necessary to prevent adverse noise impacts. (LU-1)

Policy 14.3.2: Require that construction activities employ feasible and practical techniques that minimize the noise impacts on adjacent uses. (LU-1)

City of San Bernardino Municipal Code

The City’s Municipal Code outlines the City’s exterior noise limits as it relates to stationary noise sources in Chapter 8.45 – Noise.

8.45.020. Prohibited Acts

It shall be unlawful for any person to engage in the following activities:

- M. Creating excessive noise adjacent to any school, church, court, or library while the same is in use, or adjacent to any hospital or care facility, which unreasonably interferes with the workings of such institution, or which disturbs or unduly annoys patients in the hospital, provided conspicuous signs are displayed in such streets indicating the presence of a school, institution of learning, church, court, or hospital.
- N. Making or knowingly and unreasonably permitting to be made any unreasonably loud, unnecessary, or unusual noise that disturbs the comfort, repose, health, peace and quiet, or which causes discomfort or annoyance to any reasonable person of normal sensitivity. The characteristics and conditions that may be considered in determining whether this section has been violated include, but are not limited to, the following:
 - 1. The level of noise;
 - 2. The level of background noise;
 - 3. The proximity of the noise to sleeping facilities;
 - 4. The nature and zoning of the areas within which the noise emanates;
 - 5. The density of the inhabitation of the area within which the noise emanates;
 - 6. The time of the day or night the noise occurs;
 - 7. The duration of the noise;
 - 8. Whether the noise is recurrent, intermittent, or constant; and
 - 9. Whether the noise is produced by a commercial or noncommercial activity.

8.45.070 Disturbances from Construction Activity.

No person shall be engaged or employed, or cause any other person to be engaged or employed, in any work of construction, erection, alteration, repair, addition, movement, demolition, or improvement to any building or structure except within the hours of 7:00 a.m. and 8:00 p.m.

4.4 City of Highland Noise Regulations

The noise due to the project must comply with the City of Highland's noise regulations at properties located within the City's boundaries. The City of Highland outlines its noise regulations and standards in the Noise Ordinance of the Municipal Code.

City of Highland Municipal Code

The City's Municipal Code outlines the City's exterior noise limits as it relates to stationary noise sources in Section 8.16.100 of the Municipal Code.

8.16.100. Prohibited Acts

A. The following definitions shall apply to this Section:

- 6. "Type A Property" means a property used for single family residential uses.

7. "Type B Property" means a property used for any other conditional or permitted use allowed for residential zones.
 8. "Type C Property" means a property used for any other use allowed in Highland City, including but not limited to, retail, offices, repair, sports and fitness centers, restaurants, gasoline stations, and more.
- B. Noise. The making and creation of unreasonable noise is hereby declared to be a public nuisance and may be abated, regulated, and controlled as such.
1. No person shall emit, nor shall any person cause, allow, permit, or fail to control the emission of any noise source so as to exceed the maximum allowable sound pressure levels for the type of property from which the noise emits, when measured at the receiving property.
 2. Type A Property:
 - a. Daytime: 10 dBA above ambient sound not to exceed 60 dBA.
 - b. Nighttime: 5 dBA above ambient sound not to exceed 50 dBA.
 3. Type B Property:
 - a. Daytime: 10 dBA above ambient sound not to exceed 65 dBA.
 - b. Nighttime: 5 dBA above ambient sound not to exceed 55 dBA.
 4. Type C Property:
 - a. Daytime: 10 dBA above ambient sound not to exceed 70 dBA.
 - b. Nighttime: 5 dBA above ambient sound not to exceed 60 dBA.
 5. The following shall be exempt from these regulations:
 - f. Temporary or short-term use of equipment or machinery for construction, maintenance, or cleaning, during daytime hours.

4.5 CEQA Guidelines

According to CEQA guidelines, the project would have a potential impact if it resulted in:

- a) 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?
- b) Generation of excessive groundborne vibration or groundborne noise levels?
- c) 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?

5.0 Study Method and Procedure

The following section describes the noise modeling procedures and assumptions used for this assessment.

5.1 Noise Measurement Procedure and Criteria

Noise measurements are taken to determine the existing noise levels. A noise receiver or receptor is any location in the noise analysis in which noise might produce an impact. The following criteria are used to select measurement locations and receptors:

- Locations expected to receive the highest noise impacts, such as the first row of houses
- Locations that are acoustically representative and equivalent of the area of concern
- Human land usage
- Sites clear of major obstruction and contamination

MD conducted the sound level measurements in accordance to the County's and Caltrans (TeNS) technical noise specifications. All measurement equipment meets American National Standards Institute (ANSI) specifications for sound level meters (S1.4-1983 identified in Chapter 19.68.020.AA). The following gives a brief description of the Caltrans Technical Noise Supplement procedures for sound level measurements:

- Microphones for sound level meters were placed 5-feet above the ground for all measurements
- Sound level meters were calibrated (Larson Davis CAL 200) before and after each measurement
- Following the calibration of equipment, a windscreen was placed over the microphone
- Frequency weighting was set on "A" and slow response
- Results of the long-term noise measurements were recorded on field data sheets
- During any short-term noise measurements, any noise contaminations such as barking dogs, local traffic, lawn mowers, or aircraft fly-overs were noted
- Temperature and sky conditions were observed and documented

5.2 Noise Measurement Locations

The noise monitoring locations were selected to obtain a baseline of the existing noise environment. Two (2) short-term 30-minute noise measurements were conducted at the Project site. Appendix A includes photos, the field sheet, and measured noise data. Exhibit E illustrates the location of the measurements.

5.3 FHWA Traffic Noise Prediction Model

Traffic noise from vehicular traffic was projected using the FHWA Traffic Noise Prediction Model (FHWA-RD-77-108) standards. The FHWA model arrives at the predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). Roadway volumes and percentages correspond to the county traffic counts and the ITE Trip Generation Manual. The referenced traffic data was applied to the model and is in Appendix B. The following outlines the key adjustments made to the REMEL for the roadway inputs:

- Roadway classification – (e.g., freeway, major arterial, arterial, secondary, collector, etc.),

- Roadway Active Width – (distance between the center of the outer most travel lanes on each side of the roadway)
- Average Daily Traffic Volumes (ADT), Travel Speeds, Percentages of automobiles, medium trucks and heavy trucks
- Roadway grade and angle of view
- Site Conditions (e.g., soft vs. hard)
- Percentage of total ADT which flows each hour through-out a 24-hour period

Table 1 indicates the roadway parameters and vehicle distribution utilized for this study.

Table 1: Roadway Parameters and Vehicle Distribution

Roadway	Segment	Existing ADT ¹	Existing + Project ADT ¹	Speed (MPH)	Site Conditions
Pacific Street	E of Del Rosa Dr	11,180	11,338	40	Hard
Vehicle Distribution and Mix ²					
Motor-Vehicle Type		Daytime % (7AM to 7 PM)	Evening % (7 PM to 10 PM)	Night % (10 PM to 7 AM)	Total % of Traffic Flow
Automobiles		77.5	12.9	9.6	97.4
Medium Trucks		84.8	4.9	10.3	1.8
Heavy Trucks		86.5	2.7	10.8	0.7
Notes:					
¹ Existing ADT from County of San Bernardino and Project ADT provided by Integrated Engineering Group..					
² Typical California Vehicle Distribution and Mix.					

To determine the project's noise impact to the surrounding land uses, MD generated noise contours for projected traffic conditions. Noise contours are used to provide a characterization of sound levels experienced at a set distance from the centerline of a subject roadway. They are intended to represent a worst-case scenario and do not take into account structures, sound walls, topography, and/or other sound attenuating features which may further reduce the actual noise level. Noise contours are developed for comparative purposes and are used to demonstrate potential increases/decreases along subject roadways because of a project.

5.4 SoundPLAN Noise Model (Operational Noise)

SoundPLAN (SP) acoustical modeling software was utilized to model future worst-case stationary noise impacts to the adjacent land uses. SP is capable of evaluating multiple stationary noise source impacts at various receiver locations. SP's software utilizes algorithms (based on the inverse square law and reference equipment noise level data) to calculate noise level projections. The software allows the user to input specific noise sources, spectral content, sound barriers, building placement, topography, and sensitive receptor locations.

The future worst-case noise level projections were modeled using referenced sound level data for the various stationary on-site sources (parking spaces, HVAC units, dog parks and kennels). The model assumes that the site has 121 parking spaces, six (6) dogs barking continuously in the kennels, and 12 dogs occupying the dog park throughout the hour. The model also assumes there are 11 rooftop condensing units on the proposed buildings, according to the rooftop mechanical plans.

Measured and referenced sound level data was utilized to model the various stationary on-site noise sources associated with project operation (vehicle movements, HVAC units, dog kennels and dog parks).

Parking was modeled with a reference noise level of 0.24 vehicles per hour coming or going from the parking spots. According to the trip generation, the peak hour for the 121 parking spaces will be 29 movements, therefore 0.24 vehicle movements per hour represents the loudest hour. Rooftop units were modeled as point sources, and the referenced sound power level was taken from the equipment spec sheets according to the mechanical schedule. Six (6) dogs barking in the kennels were assumed to be barking continuously for 30 minutes. Each point source was modeled with an average sound power level of 90 dBA. The dog park was modeled as an area source and calibrated to previous noise measurements of an active dog park of a similar size and capacity. Reference data is provided in Appendix C.

The model also assumes that a 6-foot tall CMU wall lines the southern residential property line in order to minimize the noise impact from the dog park. Input and output calculations are provided in Appendix D.

Exhibit E

Measurement Locations

= Short-Term
Monitoring Locations



6.0 Existing Noise Environment

Two (2) 30-minute noise measurements were conducted at the project site to document the existing noise environment. During the site visit, MD observed that traffic along Highway 210 is the primary source of noise impacting the site and surrounding area, followed by residential noise and water runoff noise from Highland Creek.

6.1 Short-Term Noise Measurement Results

The results of the short-term noise data are presented in Table 2.

Table 2: Short-Term Noise Measurement Data¹

Location	Start Time	Stop Time	Leq	Lmax	Lmin	L(2)	L(8)	L(25)	L(50)	L(90)	Estimated CNEL ²
NM1	3:33 PM	4:03 PM	52.4	67.0	45.2	55.6	54.5	53.5	52.2	47.9	50.1
NM2	4:07 PM	4:37 PM	48.2	62.7	42.5	53.4	50.4	48.1	46.8	44.9	52.8
Notes: 1. Short-term noise monitoring locations are illustrated in Exhibit E. 2. 24-hour noise levels extrapolated based on typical traffic patterns.											

Noise data indicates that the ambient noise level ranges from 48 to 52 dBA Leq at surrounding land uses. Additional field notes and photographs are provided in Appendix A.

24-hour noise data was extrapolated based on typical traffic patterns. The ambient noise level at the site is anticipated to be 50 to 53 dBA CNEL, and falls within the normally acceptable range according to Figure N-2 of the City of San Bernardino's Noise Element (Exhibit D of this report).

7.0 Future Noise Environment Impacts and Mitigation

This assessment analyzes future noise impacts to the project and compares the results to the City's Noise Standards. The analysis details the estimated exterior noise levels associated with traffic from adjacent roadway sources. The closest airport to the project area is the San Bernardino International Airport located approximately 1.8 miles south of the project site. The project site is located well outside of the 65 dBA CNEL airport noise contour, and the impact is less than significant (Figure 5 of the Tentative Tract Map No. 2528 Residential Project Noise Impact Study prepared by Vista Environmental).

7.1 Future Off-Site Exterior Noise

The exterior noise level off-site of the project will be impacted by transportation-related sources and stationary sources from the site. The following outlines the impacts associated with exterior noise levels.

7.1.1 Future Off-Site Traffic Noise Impact

The potential off-site noise impacts caused by the increase in vehicular traffic as a result of the project were calculated at the distance of the nearest residential developments from the centerline of the roadway. The calculations do not include the walls, which would reduce the levels by another 8-9 dB. The distance to the 55, 60, 65, and 70 dBA CNEL noise contours are also provided for reference.

Table 3: Existing/Existing + Project Scenario – Noise Levels Along Roadways (dBA CNEL)

Existing Exterior Noise Levels						
Roadway	Segment	CNEL (dBA)	Distance to Contour (ft)			
			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
Pacific Street.	E of Del Rosa Dr	67.6	29	91	287	907

Existing + Project Exterior Noise Levels						
Roadway	Segment	CNEL (dBA)	Distance to Contour (ft)			
			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
Pacific Street.	E of Del Rosa Dr	67.6	29	92	291	920

Change in Noise Levels as a Result of Projects					
Roadway ¹	Segment	CNEL dBA ²			
		Existing Without Project	Existing With Project	Change in Noise Level	Potential Significant Impact
Pacific Street.	E of Del Rosa Dr	67.6	67.6	0.0	No
Notes:					
¹ Exterior noise levels calculated at 5 feet above ground level.					
² Noise levels calculated from centerline of subject roadway.					

Table 3 provides the Existing and Existing + Project noise conditions and shows the change in noise level because of the proposed project. As shown in Table 3, there will be no increase in traffic noise as a result of the project. The impact is less than significant, and no mitigation is required.

7.1.2 Noise Impacts to Off-Site Receptors Due to Stationary Sources

Sensitive receptors that may be affected by project operational noise include adjacent residences to the north, south, and east. The worst-case stationary noise was modeled using SoundPLAN acoustical modeling software. The model utilizes point sources representing the rooftop HVAC units for each building and six (6) dogs barking continuously throughout the hour in the kennel area. The model also utilizes area sources representing the 0.24 movements per hour for each parking space and the occupied dog park area.

A total of four (4) receptors were modeled using the SoundPLAN noise model to evaluate the proposed project's operational impact. A receptor is denoted by a yellow dot. All yellow dots represent a property line. The results are in Exhibit F.

Project Operational Noise Levels

Exhibit F shows the "Project-only" operational noise levels at the residential property lines and how the noise will propagate at and around the site. Operational noise levels at the adjacent uses are anticipated to range between 37 dBA to 55 dBA Leq at the adjacent property lines (depending on the location).

Project Plus Ambient Operational Noise Levels

As shown in Table 4, project plus ambient noise level projections are anticipated to increase the existing ambient noise level by 0 to 5 dBA Leq at receptors (R1 – R4).

Table 4: Worst-case Predicted Operational Leq Noise Level

Receptor ¹	Existing Ambient Noise Level (dBA, Leq) ²	Project Noise Level (dBA, Leq) ³	Total Combined Noise Level (dBA, Leq)	Daytime Exterior Noise Limit (dBA, Leq)	Change in Noise Level as Result of Project
1	48	37	48	58	0
2	48	47	51	58	3
3	52	48	54	60	2
4	52	55	57	--	5
Notes: ¹ Receptors 1 through 4 represent adjacent residential property lines. ² See Appendix A for the ambient noise measurement. ³ See Exhibit F for the operational noise level projections at said receptors.					

As shown in Table 4, the project will increase the noise level by 0 to 5 dBA at receptors R1-R4. Receptors 1 through 3 are within the City of Highland's boundaries, and thus must meet the standard set in Section 8.16.100(B)(2) of the City of Highland's Municipal Code. The project plus ambient noise level will not

exceed 60 dBA or increase the existing ambient by 10 dB, thus, the noise due to the project is less than significant at Receptors 1 through 3.

Receptor 4 is within the City of San Bernadino's boundaries. The City's noise code does not specify a quantitative noise standard, but instead prohibits unreasonably loud and disturbing noise. Table 5 provides the characteristics associated with changes in noise levels.

Table 5: Change in Noise Level Characteristics

Changes in Intensity Level, dBA	Changes in Apparent Loudness
1	Not perceptible
3	Just perceptible
5	Clearly noticeable
10	Twice (or half) as loud

https://www.fhwa.dot.gov/environMent/noise/regulations_and_guidance/polguide/polguide02.cfm

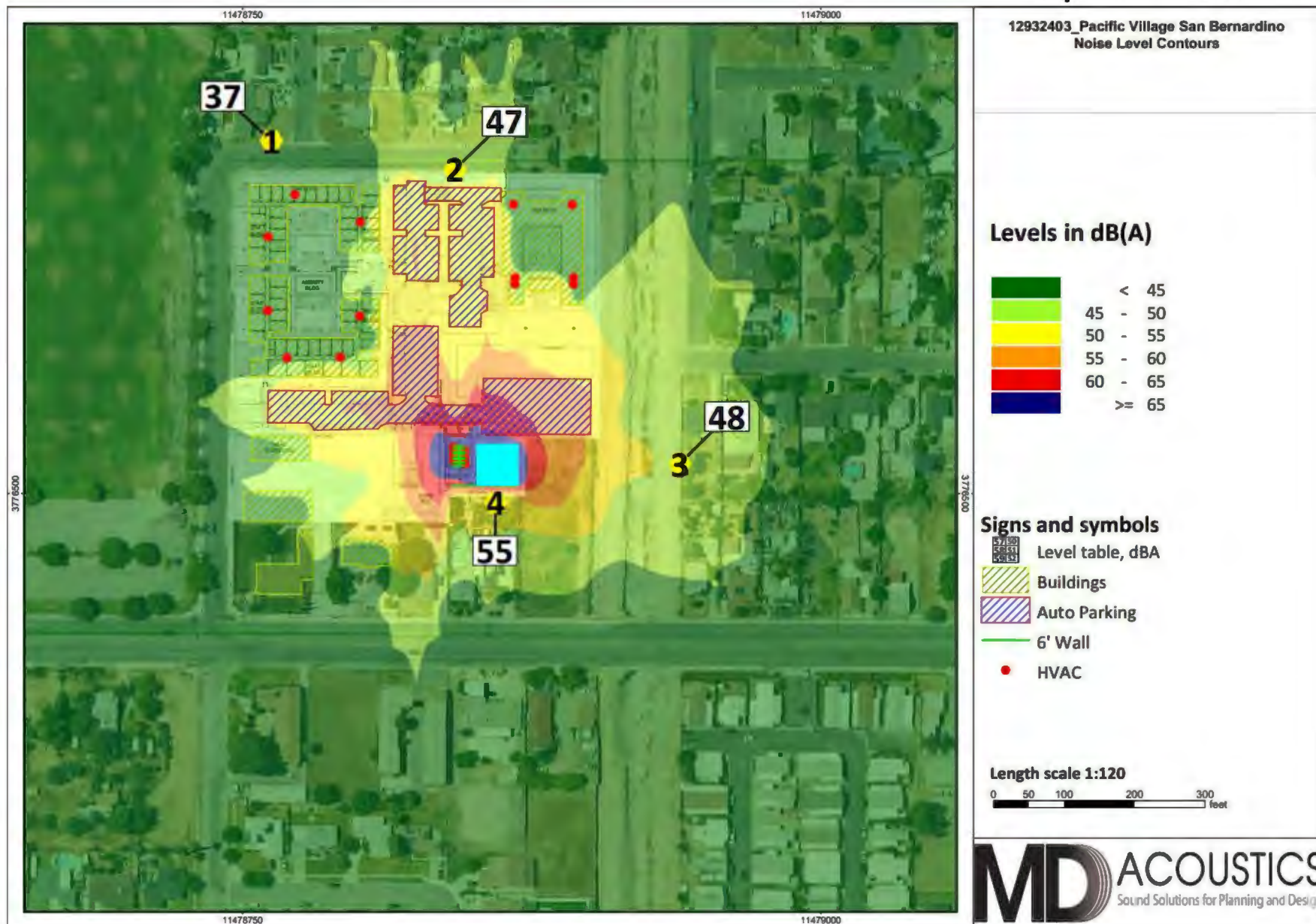
The change in noise level would be "Clearly Noticeable" at Receptor 4. While a 5 dB increase may be noticeable, the total ambient noise level of 57 dBA Leq is approximately the same noise level as a typical multi-family residential neighborhood and would not be considered unreasonable. Thus, the change in noise level will be less than significant.

In order to ensure the impact is less than significant at the southern residential property (Receptor 4), the following mitigation measure was assumed:

1. A 6-foot tall CMU wall will line the southern residential property line in order to minimize the noise impact from the dog park (see Exhibit F).

Exhibit F

Operational Noise Levels



8.0 Construction Noise Impact

The degree of construction noise may vary for different areas of the project site and also vary depending on the construction activities. Noise levels associated with the construction will vary with the different phases of construction. The construction noise and vibration level projections are provided in the sections below.

8.1 Construction Noise

The Environmental Protection Agency (EPA) has compiled data regarding the noise generated characteristics of typical construction activities. The data is presented in Table 5.

Table 5: Typical Construction Noise Levels¹

Equipment Powered by Internal Combustion Engines	
Type	Noise Levels (dBA) at 50 Feet
Earth Moving	
Compactors (Rollers)	73 - 76
Front Loaders	73 - 84
Backhoes	73 - 92
Tractors	75 - 95
Scrapers, Graders	78 - 92
Pavers	85 - 87
Trucks	81 - 94
Materials Handling	
Concrete Mixers	72 - 87
Concrete Pumps	81 - 83
Cranes (Movable)	72 - 86
Cranes (Derrick)	85 - 87
Stationary	
Pumps	68 - 71
Generators	71 - 83
Compressors	75 - 86
Impact Equipment	
Type	Noise Levels (dBA) at 50 Feet
Saws	71 - 82
Vibrators	68 - 82
Notes: ¹ Referenced Noise Levels from the Environmental Protection Agency (EPA)	

Construction is anticipated to occur during the permissible hours as described in the City's Municipal Code Section 8.45.070.

Construction noise is considered a short-term impact and would be considered significant if construction activity does not follow the above requirements or if construction occurs outside the allowable times as described in the City's Municipal Code. Construction noise will have a temporary or periodic increase in

the ambient noise level above the existing within the project vicinity. The construction noise impact is considered less than significant; however, construction noise level projections are provided.

Sensitive land uses surrounding the site include residential to the north, south, and east. The closest sensitive land use to the project is the residential zoning to the south of the site and north of Pacific Street. The residential property is an average of 225 feet away from construction activities and as close as 15 feet from construction activities.

CalEEMod methodology was utilized to determine the construction equipment. 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. Noise levels are in Table 6. A likely worst-case construction noise scenario assumes equipment operating as close as 15 feet and an average of 225 feet from the property line of the nearest sensitive receptor, the residences to the south. The Lmax levels represent maximum levels when construction occurs adjacent to the residential receptors. Leq levels represent the average construction noise level during each phase.

Table 6: Construction Noise Levels East Property Line

Phase	dBA Lmax	dBA Leq
Demo	100.5	71.4
Site Prep	94.5	73.0
Grading	95.5	73.8
Build	94.5	73.1
Paving	94.5	70.1
Arch Coating	88.5	61.0
Notes: Const Equip from CalEEMod		

As shown in Table 6, project construction noise will range between 61 to 74 dBA Leq and 86 to 101 dBA Lmax at the nearest sensitive receptor (without the implementation of mufflers and other sound attenuating devices). Construction will occur within the permissible hours as described in the City's Municipal Code; thus, the impact is temporary and less than significant. However, Section 8.3 of this report provides additional construction policies to reduce the construction noise levels at surrounding properties.

8.2 Construction Vibration

Construction activities can produce vibration that may be felt by adjacent land uses. The construction of the proposed project would not require the use of equipment such as pile drivers, which are known to generate substantial construction vibration levels. The primary vibration source during construction may be from a vibratory roller. A vibratory has a vibration impact of 0.210 inches per second peak particle velocity (PPV) at 25 feet which is perceptible but below any risk to architectural damage.

The fundamental equation used to calculate vibration propagation through average soil conditions and distance is as follows:

$$PPV_{\text{equipment}} = PPV_{\text{ref}} (100/D_{\text{rec}})^n$$

Where: PPV_{ref} = reference PPV at 100ft.

D_{rec} = distance from equipment to receiver in ft.

$n = 1.1$ (the value related to the attenuation rate through ground)

The thresholds from the Caltrans Transportation and Construction Induced Vibration Guidance Manual in Table 7 (below) provides general thresholds and guidelines as to the vibration damage potential from vibratory impacts.

Table 7: Guideline Vibration Damage Potential Threshold Criteria

Structure and Condition	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5
Source: Table 19, Transportation and Construction Vibration Guidance Manual, Caltrans, Sept. 2013. Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.		

Table 8 gives approximate vibration levels for particular construction activities. This data provides a reasonable estimate for a wide range of soil conditions.

Table 8: Vibration Source Levels for Construction Equipment¹

Equipment	Peak Particle Velocity (inches/second) at 25 feet	Approximate Vibration Level LV (dVB) at 25 feet
Pile driver (impact)	1.518 (upper range)	112
	0.644 (typical)	104
Pile driver (sonic)	0.734 upper range	105
	0.170 typical	93
Clam shovel drop (slurry wall)	0.202	94
Hydromill	0.008 in soil	66
(slurry wall)	0.017 in rock	75
Vibratory Roller	0.21	94
Hoe Ram	0.089	87
Large bulldozer	0.089	87

Equipment	Peak Particle Velocity (inches/second) at 25 feet	Approximate Vibration Level LV (dVB) at 25 feet
Caisson drill	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58
¹ Source: Transit Noise and Vibration Impact Assessment, Federal Transit Administration, May 2006.		

The nearest residential façade is at least 55 feet from the project site. At a distance of 55 feet, a vibratory roller would yield a worst-case 0.088 PPV (in/sec) which may be perceptible but sustainably below any risk of damage (0.3 in/sec PPV is the threshold of old residential structures). The impact is less than significant, and no mitigation is required.

8.3 Construction Noise Reduction Policies

Construction operations must follow the City's Noise Ordinance, which states that construction, repair or excavation work performed must occur within the permissible hours. To ensure that construction activities do not disrupt the adjacent land uses, the following measures should be taken:

1. During construction, the contractor will ensure all construction equipment is equipped with appropriate noise attenuating devices. Equipment with a sound power level of 80 dB or higher must be equipped with mufflers.
2. The contractor will locate equipment staging areas as far as possible, away from the sensitive receptors.
3. Idling equipment will be turned off when not in use.
4. Equipment will be maintained so that vehicles and their loads are secured from rattling and banging.

9.0 CEQA Analysis

The California Environmental Quality Act Guidelines establishes thresholds for noise impact analysis as presented below:

(a) Would the project result in the 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 Code, or applicable standards of other agencies?

Transportation Noise Impacts

Transportation noise impacts would be considered significant if the existing plus project levels are expected to increase by more than 3 dB. Compared to existing traffic noise levels, future traffic volumes are not expected to increase due to the project. The impact is therefore less than significant.

Stationary Noise Sources

Stationary noise impacts would be considered significant if they result in exceedances of Section 8.16.100(B)(2) of the City of Highland's Municipal Code or Section 8.45.020(N) of the City of San Bernardino's Municipal Code. Implementation of the proposed project may result in stationary noise related to HVAC systems, parking, and dog activity. The stationary noise was modeled in SoundPLAN to analyze the noise impact at surrounding receptors (Exhibit F). The project plus ambient noise level will not exceed 60 dBA or increase the existing ambient by 10 dB at sensitive receptors, thus, the project complies with the City of Highland's code. The project will increase the ambient noise level by a maximum of 5 dB at the nearest receptor within the City of San Bernardino. While a 5 dB increase may be noticeable, the total ambient noise level of 57 dBA Leq is approximately the same noise level as a typical multi-family residential neighborhood and would not be considered unreasonable. Thus, the change in noise level will be less than significant. The stationary noise impact would therefore be less than significant.

Construction Noise and Vibration

Construction noise will be significant if construction activities occur outside of the permitted construction hours specified in Section 8.45.070 of the City of San Bernardino's Municipal Code.

Noise due to construction will result in short-term noise impacts associated with construction activities. However, construction will comply with the City's code, and the impact is less than significant.

b) Generate excessive ground-borne vibration or ground-borne noise levels?

Construction vibration will be significant if vibration exceeds levels that would result in structural damage to existing buildings. At a distance of 55 feet, the nearest building to the project property line, a vibratory roller would yield a worst-case 0.088 PPV (in/sec), which may be perceptible but is below the threshold of any risk of damage. Therefore, the impact is less than significant.

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

The project is located outside of the 65 dBA noise contour of the nearest airport. Thus, the impact due to airport/aircraft noise is less than significant.

10.0 References

State of California General Plan Guidelines: 1998. Governor's Office of Planning and Research

City of San Bernardino: General Plan Noise Element.

City of San Bernardino: Municipal Code Chapter 8.45.

City of Highland: Municipal Code Section 8.16.100.

ITE Trip Generation Manual

Konan Vibration Criteria

Federal Highway Administration. Noise Barrier Design Handbook. June 2017.

Federal Transit Administration. Transit Noise and Vibration Impact Assessment Manual. September 2018

Appendix A:
Photographs and Field Measurement Data

15-Minute Continuous Noise Measurement Datasheet

Project Name:	Pacific Village Noise	Site Observations:
Project: #/Name:	1293-2024-003	69F Winds 1-2 MPH. The site is a mixture of power dirt, sand, and clay. The primary noise source is traffic on the Highway, then residential noise, and then water from a nearby run-off area
Site Address/Location:	2626 Pacific Street	
Date:	05/23/2024	
Field Tech/Engineer:	Jason Schuyler / Rachel Edelman	
Sound Meter:	XL2, NTI	SN: A2A-08562-E0
Settings:	A-weighted, slow, 1-sec, 15-minute interval	
Site Id:	NM1, NM2	



15-Minute Continuous Noise Measurement Datasheet - Cont.

Project Name: Pacific Village Noise
Site Address/Location: 2626 Pacific Street
Site Id: NM1, NM2

Figure 1: NM1

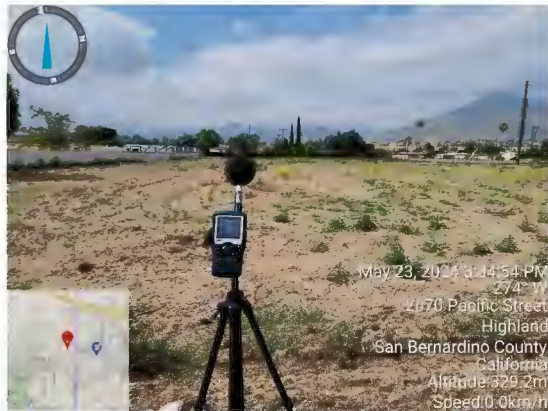


Figure 2: NM1



Figure 3: NM2

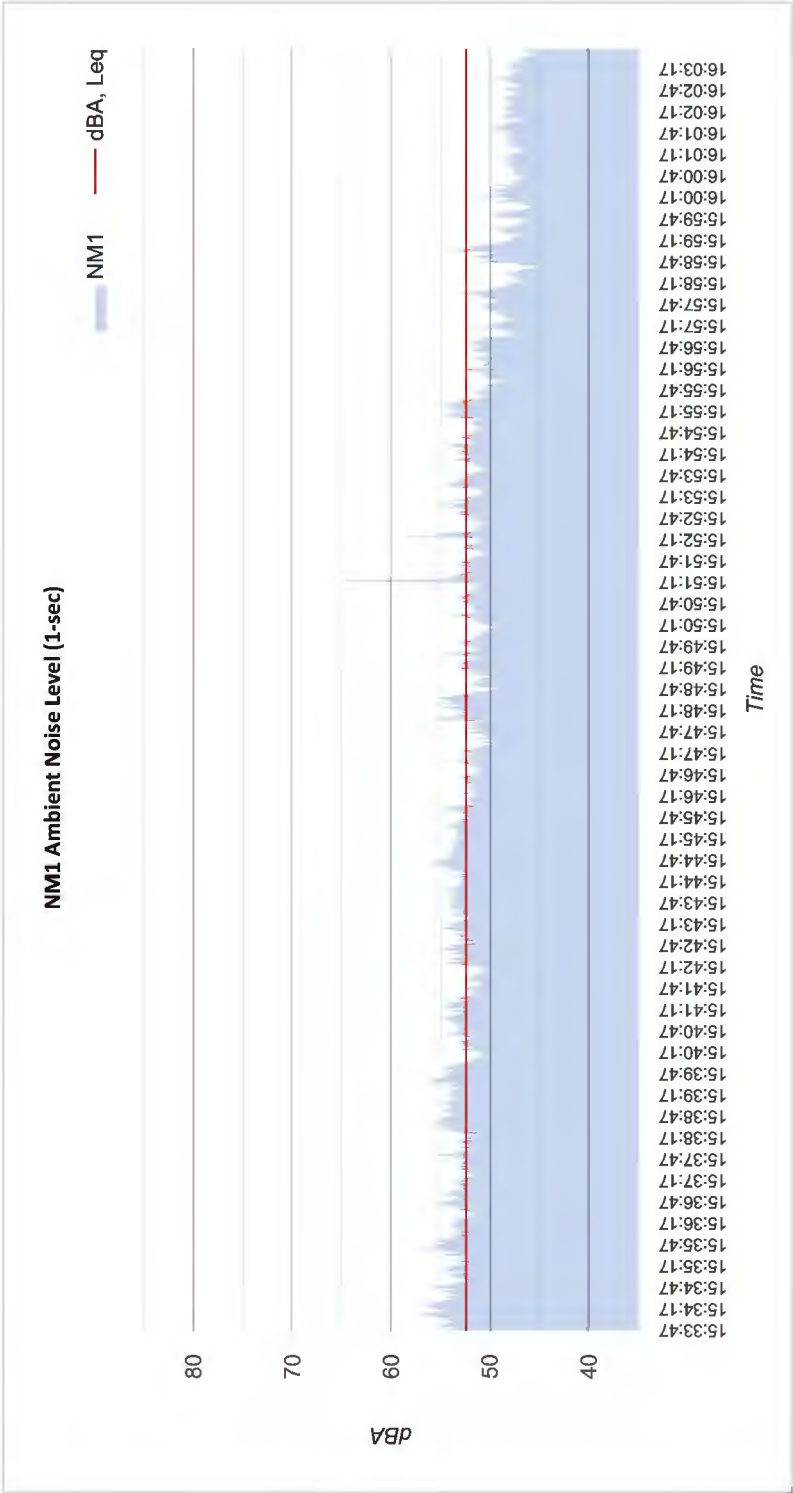


Table 1: Baseline Noise Measurement Summary

Location	Start	Stop	Leq	Lmax	Lmin	L2	L8	L25	L50	L90
NM1	3:33 PM	4:03 PM	52.4	67.0	45.2	55.6	54.5	53.5	52.2	47.9
NM2	4:07 PM	4:37 PM	48.2	62.7	42.5	53.4	50.4	48.1	46.8	44.9

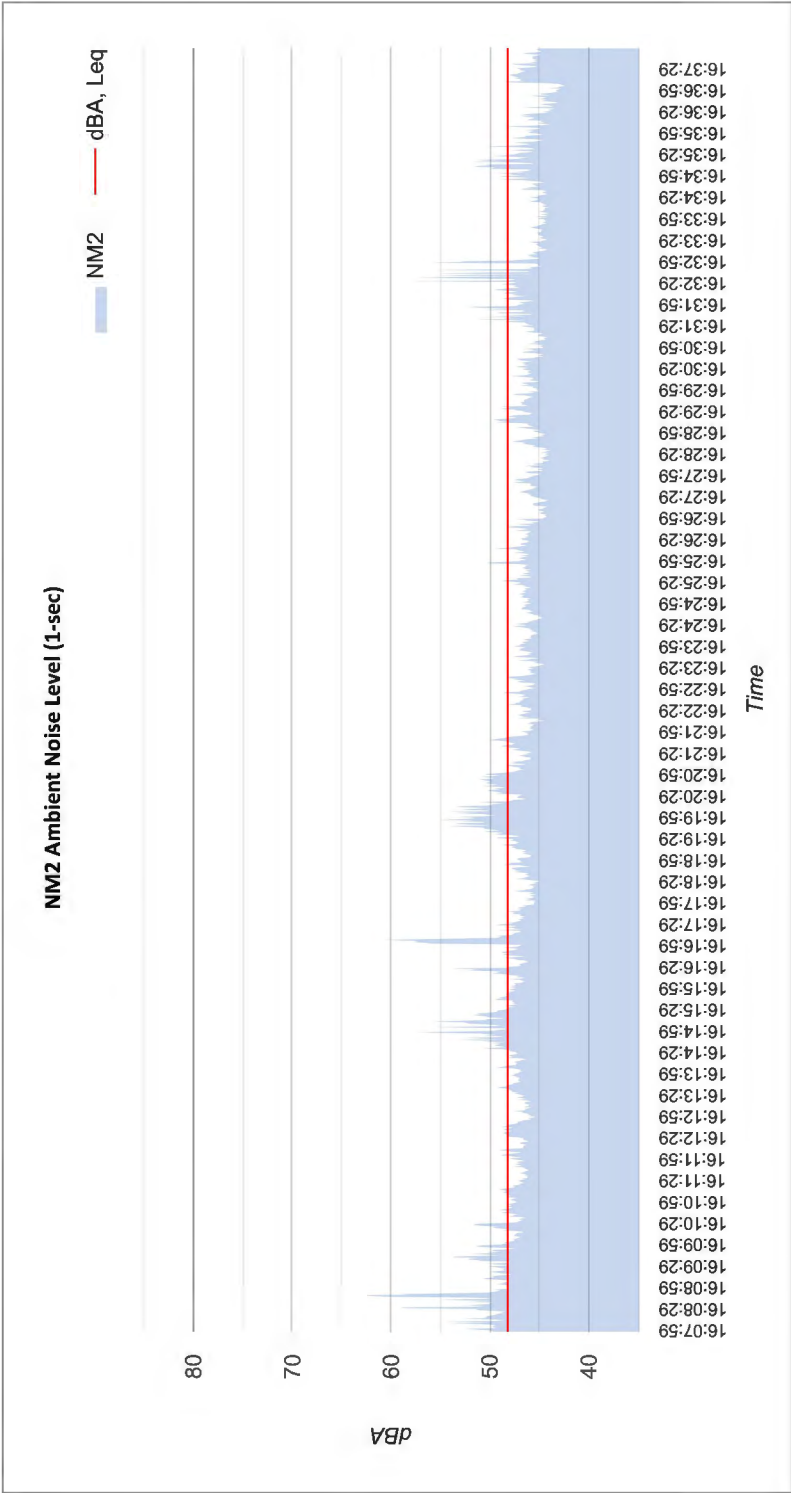
15-Minute Continuous Noise Measurement Datasheet - Cont.

Project Name:	Pacific Village Noise	Site Topo:	Buildings 1-2 stories tall site	Noise Source(s) w/ Distance:	
Site Address/Location:	2626 Pacific Street	Meteorological Cond.:	69F partly cloudy winds 0-5MPH		road noise and residential noise
Site Id:	NM1	Ground Type:	Sandy soil and clay		

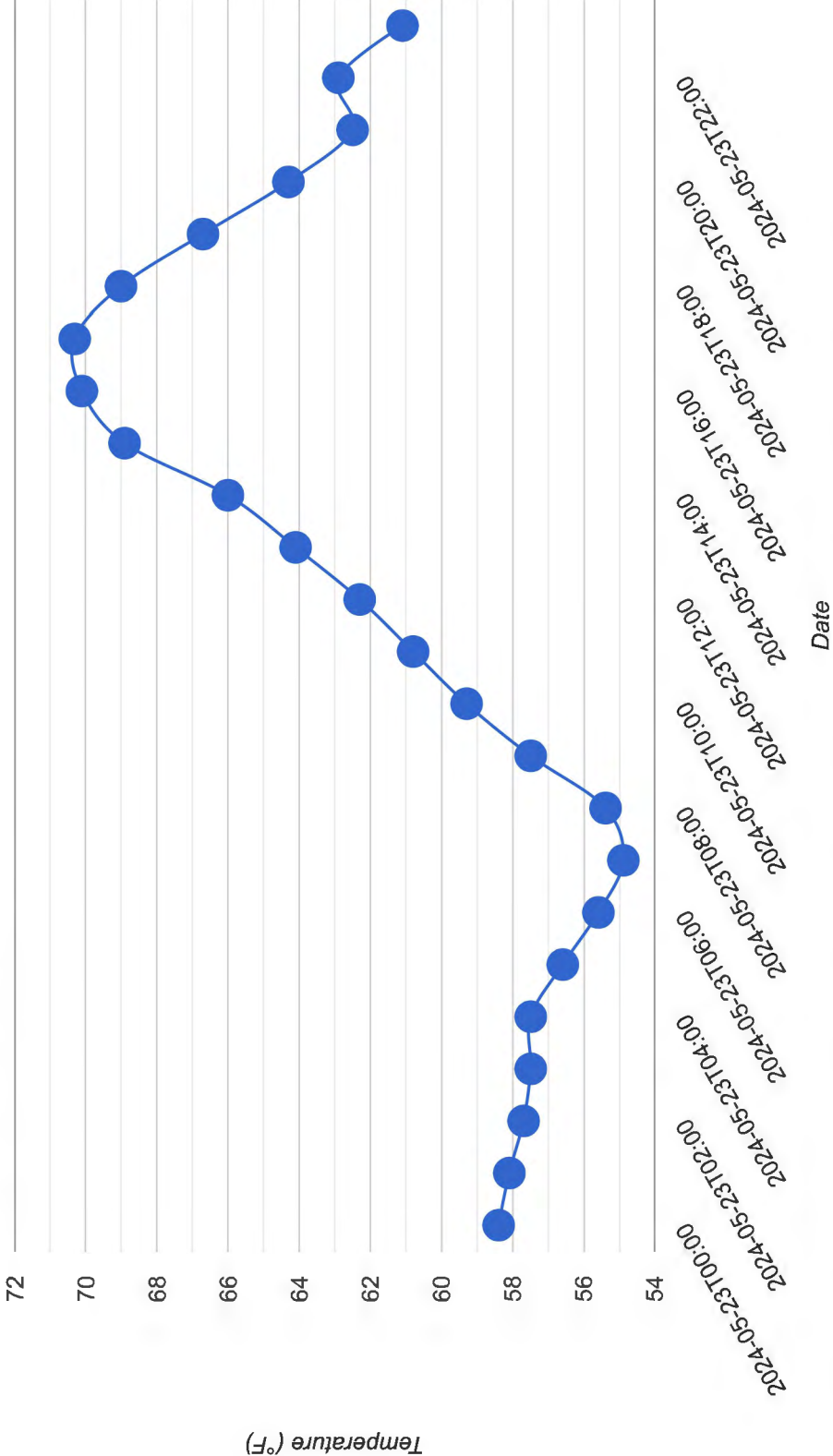


15-Minute Continuous Noise Measurement Datasheet - Cont.

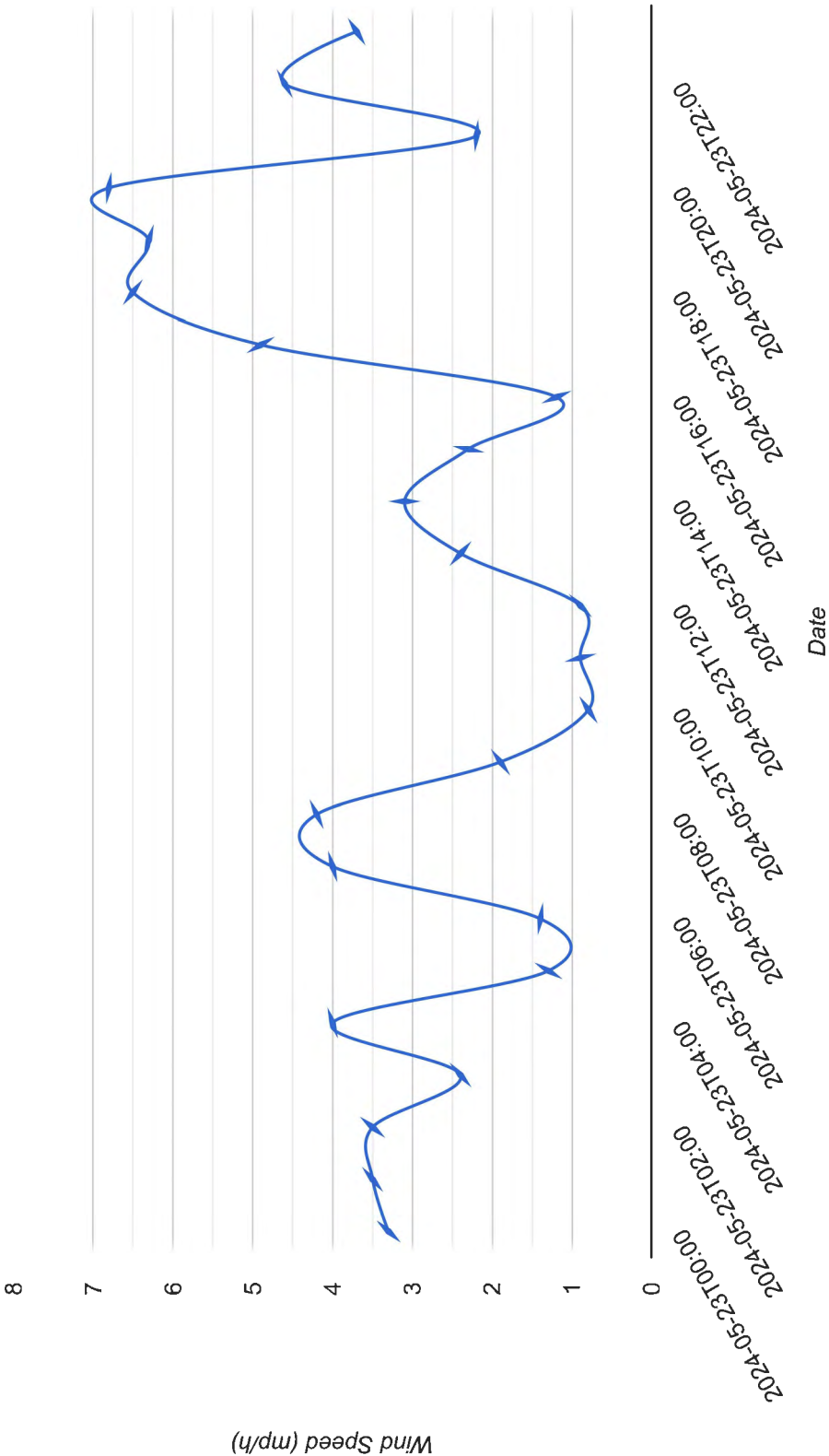
Project Name:	Pacific Village Noise	Site Topo:	Buildings 1-2 stories tall	Noise Source(s) w/ Distance:
Site Address/Location:	2626 Pacific Street	Meteorological Cond.:	69F partly cloudy winds 0-5MPH	road noise and residential noise
Site Id:	NM2	Ground Type:	loose powdery dirt with piles of rock	



Weather forecast for 2024-05-23



Wind speed and directions for 2024-05-23



Source: Global Forecast System (GFS) weather forecast model

Appendix B:
Traffic Noise Modeling Output

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

PROJECT: PACIFIC VILLAGE
ROADWAY: PACIFIC ST
LOCATION: RESIDENCES 50' FROM C/L

JOB #: 1293-2024-03
DATE: #####
ENGINEER R. Edelman

NOISE INPUT DATA - EXISTING

ROADWAY CONDITIONS

ADT = 11,180
SPEED = 40
PK HR % = 10
NEAR LANE/FAR LANE DI = 48
ROAD ELEVATION = 0.0
GRADE = 1.0 %
PK HR VOL = 1,118

RECEIVER INPUT DATA

RECEIVER DISTANCE = 50
DIST C/L TO WALL = 50
RECEIVER HEIGHT = 5.0
WALL DISTANCE FROM RECEIVER = 0
PAD ELEVATION = 0.5
ROADWAY VIEW: LF ANGLE = -90
RT ANGLE = 90
DF ANGLE = 180

SITE CONDITIONS

AUTOMOBILES = 10
MEDIUM TRUCKS = 10
HEAVY TRUCKS = 10
(10 = HARD SITE, 15 = SOFT SITE)

WALL INFORMATION

HTH WALL = 0.0
AMBIENT = 0.0
BARRIER = 0 (0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.9742
MEDIUM TRUCKS	0.848	0.049	0.103	0.0184
HEAVY TRUCKS	0.865	0.027	0.108	0.0074

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	44.00	--
MEDIUM TRUCKS	4.0	43.89	--
HEAVY TRUCKS	8.0	43.93	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	66.9	65.0	63.2	57.2	65.8	66.4
MEDIUM TRUCKS	58.6	57.1	50.7	49.2	57.7	57.9
HEAVY TRUCKS	59.5	58.1	49.0	50.3	58.6	58.8
NOISE LEVELS (dBA)	68.1	66.3	63.6	58.5	67.1	67.6

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	66.9	65.0	63.2	57.2	65.8	66.4
MEDIUM TRUCKS	58.6	57.1	50.7	49.2	57.7	57.9
HEAVY TRUCKS	59.5	58.1	49.0	50.3	58.6	58.8
NOISE LEVELS (dBA)	68.1	66.3	63.6	58.5	67.1	67.6

NOISE CONTOUR (FT)

NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	29	91	287	907
LDN	26	81	256	808

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

PROJECT: PACIFIC VILLAGE
 ROADWAY: PACIFIC ST
 LOCATION: RESIDENCES 50' FROM C/L

JOB #: 1293-2024-03
 DATE: #####
 ENGINEER R. Edelman

NOISE INPUT DATA - EXISTING

ROADWAY CONDITIONS

ADT = 11,338
 SPEED = 40
 PK HR % = 10
 NEAR LANE/FAR LANE DI = 48
 ROAD ELEVATION = 0.0
 GRADE = 1.0 %
 PK HR VOL = 1,134

RECEIVER INPUT DATA

RECEIVER DISTANCE = 50
 DIST C/L TO WALL = 50
 RECEIVER HEIGHT = 5.0
 WALL DISTANCE FROM RECEIVER = 0
 PAD ELEVATION = 0.5
 ROADWAY VIEW: LF ANGLE = -90
 RT ANGLE = 90
 DF ANGLE = 180

SITE CONDITIONS

AUTOMOBILES = 10
 MEDIUM TRUCKS = 10
 HEAVY TRUCKS = 10
 (10 = HARD SITE, 15 = SOFT SITE)

WALL INFORMATION

HTH WALL = 0.0
 AMBIENT = 0.0
 BARRIER = 0 (0 = WALL, 1 = BERM)

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.9742
MEDIUM TRUCKS	0.848	0.049	0.103	0.0184
HEAVY TRUCKS	0.865	0.027	0.108	0.0074

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES	2.0	44.00	--
MEDIUM TRUCKS	4.0	43.89	--
HEAVY TRUCKS	8.0	43.93	0.00

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	67.0	65.1	63.3	57.2	65.9	66.5
MEDIUM TRUCKS	58.7	57.2	50.8	49.3	57.7	58.0
HEAVY TRUCKS	59.6	58.1	49.1	50.4	58.7	58.8
NOISE LEVELS (dBA)	68.2	66.4	63.7	58.6	67.1	67.6

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	67.0	65.1	63.3	57.2	65.9	66.5
MEDIUM TRUCKS	58.7	57.2	50.8	49.3	57.7	58.0
HEAVY TRUCKS	59.6	58.1	49.1	50.4	58.7	58.8
NOISE LEVELS (dBA)	68.2	66.4	63.7	58.6	67.1	67.6

NOISE CONTOUR (FT)

NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	29	92	291	920
LDN	26	82	259	820

Appendix C:

Reference Data

Job Name:

System Reference:

Date:

208/230V OUTDOOR VRF HEAT RECOVERY SYSTEM



UNIT OPTION

☒ Standard Model.....TURYE1203AN40AN☒ Seacoast (BS) Model.....TURYE1203AN40AB

ACCESSORIES

☒ Big Foot Stand.....for details see Big Foot Stands submittals☒ HBC Controller (Required).....for details see HBC Controller Submittals☒ Joint Kit.....for details see Pipe Accessories Submittal☒ Low Ambient Kit.....for details see Low Ambient Kit Submittal☒ Panel Heater Kit.....for details see Panel Heater Kit Submittal☒ Snow/Hail Guards Kit.....for details see Snow/Hail Guards Kit Submittal

Specifications			System
Unit Type			TURYE1203AN40A(N/B)
Cooling Capacity (Nominal)		BTU/H	120,000
Heating Capacity (Nominal)		BTU/H	135,000
Guaranteed Operating Range	Cooling	°F [°C]	23~126 [-5.0~52.0]
	Heating	°F [°C]	-13~60 [-25.0~15.5]
Extended Operating Range	Heating	°F [°C]	-27.4~60 [-33.0~15.5]
External Dimensions (H x W x D)		In. [mm]	71-5/8 x 48-7/8 x 29-3/16 [1,818 x 1,240 x 740]
Net Weight		Lbs. [kg]	622 [282]
External Finish		Pre-coated galvanized steel sheet (+powder coating for -BS type) [MUNSELL 5Y 8/1]	
Electrical Power Requirements		Voltage, Phase, Hertz, Power Tolerance	208/230V, 3-phase, 60 Hz, ±10%
Minimum Circuit Ampacity		A	56.0/55.0
Maximum Overcurrent Protection		A	90/90
Recommended Fuse Size		A	60/60
Recommended Minimum Wire Size		AWG [mm]	4/4 [21.2/21.2]
SCCR		kA	5
Refrigerant Piping Diameter	Liquid (High Pressure)	In. [mm]	3/4 [19.05] Braze
	Gas (Low Pressure)	In. [mm]	1-1/8 [28.58] Braze
Max. Total Refrigerant Line Length		Ft.	370
Max. Refrigerant Line Length to HBC Controller		Ft.	370
Max. Equalization Line Length between Main HBC Controller		Ft.	131
Indoor Unit Connectable	Total Capacity	50.0~150.0% of outdoor unit capacity	
	Model/Quantity	WL06~WL48/1.0~30.0	
Sound Pressure Levels		dB(A)	60.0/62.0
Sound Power Levels		dB(A)	80.0/80.5
FAN ⁴	Type x Quantity	Propeller fan x 2	
	Fan Motor Output	kW	0.46+0.46
	Airflow Rate	CFM	8,300
	External Static Pressure	In. WG	Selectable; 0.00, 0.12, 0.24, 0.32, In. WG; factory set to 0 In. WG
Compressor Operating Range		15.0% to 100.0%	
Compressor	Type x Quantity	Inverter scroll hermetic compressor x 1	
	Type x Original Charge	R410A x 17.0 lbs + 10.0 oz [8.0 kg]	
Protection Devices	High Pressure Protection	High pressure sensor, High pressure switch at 4.15 MPa (601 psi)	
	Inverter Circuit (Comp./Fan)	Over-current protection	
AHRI Ratings (Ducted/Non-ducted)	EER	10.4/10.6	
	IEER	21.7/23.0	
	COP	3.71/4.04	
	SCHE	25.3/29.1	

NOTES:

Nominal cooling conditions (Test conditions are based on AHRI 1230-2023)

Indoor: 80°F DB./67°F WB. (26.7°C DB./19.4°C WB.), Outdoor: 95°F DB. (35°C DB.)

Nominal heating conditions (Test conditions are based on AHRI 1230-2023)

Indoor: 70°F DB. (21.1°C DB.), Outdoor: 47°F DB./43°F WB. (8.3°C DB./6.1°C WB.)

¹Harsh weather environments may demand performance enhancing equipment. Ask your Mitsubishi Electric representative for more details about your region²For details on extended cooling operation range down to -10° F DB, see Low Ambient Kit Submittal³When applying product below -4°F, consult your design engineer for cold climate application best practices, including the use of a backup source for heating⁴Unit will continue to operate in extended operating range, but capacity is not guaranteed

OUTDOOR UNIT: TURYE1203AN40A(N/B) – DIMENSIONS

PURY-EP96, 120, 144TNU-A(-BS)

Unit: mm(in)

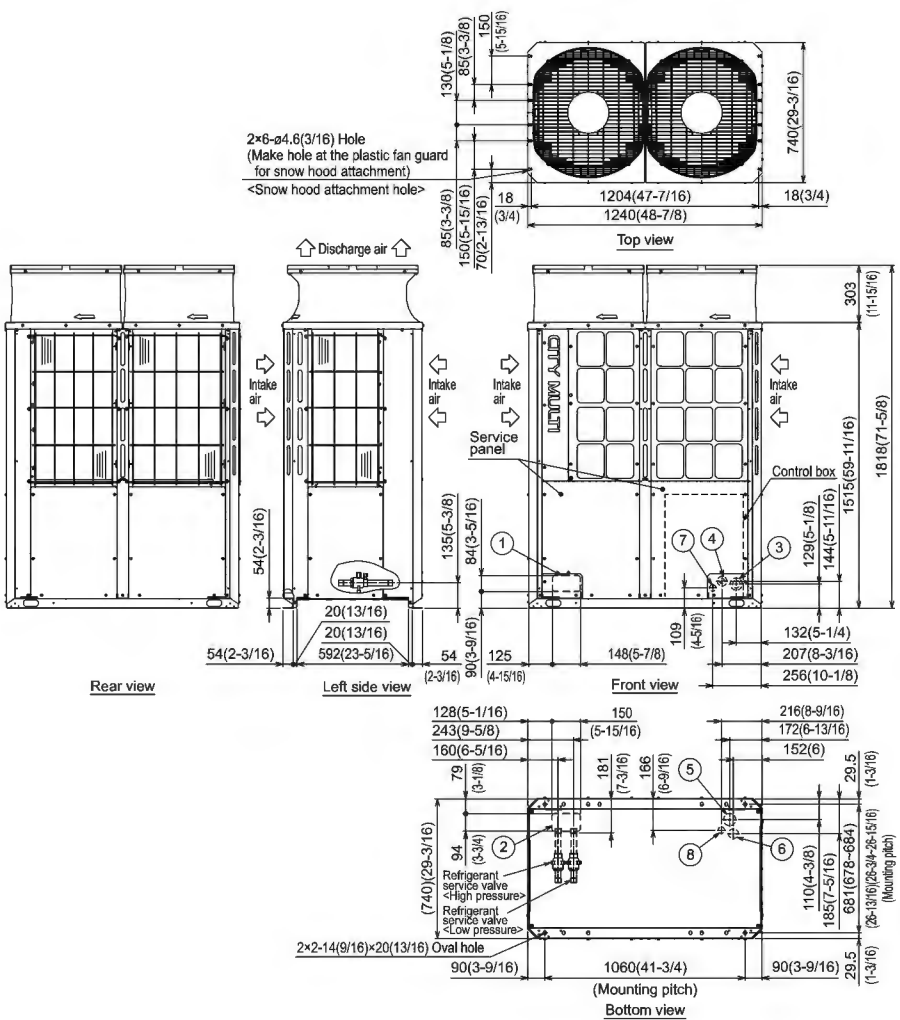
Note 1. At brazing of pipes, wrap the refrigerant service valve with wet cloth and keep the temperature of refrigerant service valve under 120°C(248°F).

Connecting pipe specifications

Model	Diameter			
	Refrigerant pipe		Service valve	
	High pressure	Low pressure	High pressure	Low pressure
EP96	φ13.05(3/4)	Brazed *1	φ22.2(7/8)	Brazed *1
EP120			φ28.58(1-1/8)	
EP144	φ22.2(7/8)	Brazed *1		φ28.58(1-1/8)

*1 Connect the refrigerant pipe to the service valve according to the Installation Manual.

NO.	Usage	Specifications
①	For pipes	Front through hole 148(5-7/8) × 84(3-3/8) Knockout hole
②		Bottom through hole 150(5-15/16) × 94(3-3/4) Knockout hole
③		Front through hole ø62.7(2-1/2) or ø34.5(1-3/8) Knockout hole
④	For wires	Front through hole ø43.7(1-3/4) or ø22.2(7/8) Knockout hole
⑤		Bottom through hole ø65(2-9/16) Knockout hole
⑥		Bottom through hole ø52(2-1/16) Knockout hole
⑦	For transmission cables	Front through hole ø34(1-3/8) Knockout hole
⑧		Bottom through hole ø34(1-3/8) Knockout hole



NOTES:

SEACOAST PROTECTION

Anti-corrosion Protection: A coating treatment is applied to condenser coil for protection from air contaminants.

Standard: Salt Spray Test Method - no unusual rust development to 480 hours.

Sea Coast (BS): Salt Spray Test Method (JRA 9002) - no unusual rust development to 960 hours.

FORM# TURYE1203AN40A(N/B) - 202405



Job Name:

System Reference:

Date:

460V OUTDOOR VRF HEAT RECOVERY SYSTEM



UNIT OPTION

☒ Standard Model.....TURYP0964AN40AN☒ Seacoast (BS) Model.....TURYP0964AN40AB

ACCESSORIES

☒ Big Foot Stand.....for details see Big Foot Stands submittals☒ BC Controller (Required).....for details see BC Controller Submittals☒ Joint Kit.....for details see Pipe Accessories Submittal☒ Low Ambient Kit.....for details see Low Ambient Kit Submittal☒ Panel Heater Kit.....for details see Panel Heater Kit Submittal☒ Snow/Hail Guards Kit.....for details see Snow/Hail Guards Kit Submittal

Specifications			System
Unit Type			TURYP0964AN40A(N/B)
Cooling Capacity (Nominal)		BTU/H	96,000
Heating Capacity (Nominal)		BTU/H	108,000
Guaranteed Operating Range	Cooling	°F [°C]	23~126 [-5.0~52.0]
	Heating	°F [°C]	-13~60 [-25.0~15.5]
Extended Operating Range	Heating	°F [°C]	-18.0~60 [-18.0~15.5]
External Dimensions (H x W x D)		In. [mm]	71-5/8 x 48-7/8 x 29-3/16 [1,818 x 1,240 x 740]
Net Weight		Lbs. [kg]	611 [277]
External Finish		Pre-coated galvanized steel sheet (+powder coating for -BS type) [MUNSELL 5Y 8/1]	
Electrical Power Requirements		Voltage, Phase, Hertz, Power Tolerance	460V, 3-phase, 60 Hz, ±10%
Minimum Circuit Ampacity		A	19.0
Maximum Overcurrent Protection		A	30
Recommended Fuse Size		A	20
Recommended Minimum Wire Size		AWG [mm]	12 [3.3]
SCCR		kA	5
Refrigerant Piping Diameter	Liquid (High Pressure)	In. [mm]	3/4 [19.05] Braze
	Gas (Low Pressure)	In. [mm]	7/8 [22.2] Braze
Max. Total Refrigerant Line Length		Ft.	1,804
Max. Refrigerant Line Length (Between ODU & IDU)		Ft.	541
Max. Control Wiring Length		Ft.	1,640
Indoor Unit Connectable	Total Capacity	50.0~150.0% of outdoor unit capacity	
	Model/Quantity	P04~P96/1.0~24.0	
Sound Pressure Levels		dB(A)	58.5/60.0
Sound Power Levels		dB(A)	77.5/79.0
FAN ⁴	Type x Quantity	Propeller fan x 2	
	Fan Motor Output	kW	0.46+0.46
	Airflow Rate	CFM	7,400
	External Static Pressure	In. WG	Selectable; 0.00, 0.12, 0.24, 0.32, In. WG; factory set to 0 In. WG
Compressor Operating Range		15.0% to 100.0%	
Compressor		Type x Quantity	Inverter scroll hermetic compressor x 1
Refrigerant		Type x Original Charge	R410A x 17.0 lbs + 10.0 oz [8.0 kg]
Protection Devices	High Pressure Protection	High pressure sensor, High pressure switch at 4.15 MPa (601 psi)	
	Inverter Circuit (Comp./Fan)	Over-heat protection, Over-current protection	
AHRI Ratings (Ducted/Non-ducted)	EER	11.1/11.5	
	IEER	22.2/23.8	
	COP	3.88/4.14	
	SCHE	23.5/28.3	

NOTES:

Nominal cooling conditions (Test conditions are based on AHRI 1230-2023)

Indoor: 80°F D.B./67°F W.B. (26.7°C D.B./19.4°C W.B.), Outdoor: 95°F D.B. (35°C D.B.)

Nominal heating conditions (Test conditions are based on AHRI 1230-2023)

Indoor: 70°F D.B. (21.1°C D.B.), Outdoor: 47°F D.B./43°F W.B. (8.3°C D.B./6.1°C W.B.)

¹Harsh weather environments may demand performance enhancing equipment. Ask your Mitsubishi Electric representative for more details about your region²For details on extended cooling operation range down to -10° F DB, see Low Ambient Kit Submittal³When applying product below -4°F, consult your design engineer for cold climate application best practices, including the use of a backup source for heating⁴Unit will continue to operate in extended operating range, but capacity is not guaranteed

Unit: mm(in)



Project: Pet & Mac's Pet Resort - Noise Monitoring, City of Avondale, AZ
Client: Pete and Mac's
Site Location: 13034 W Rancho Santa Fe Blvd, Avondale, AZ
Date: 4/26/2017
Engineer: Mike Dickerson
Source/System: Outdoor Play Area

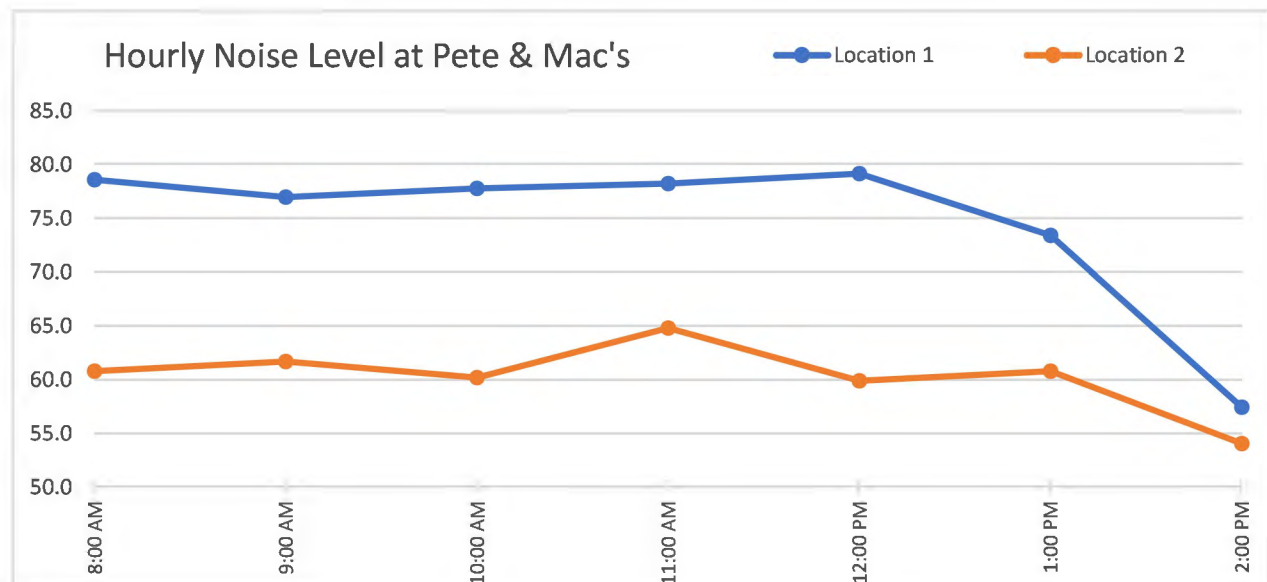
Test Procedure: SLMs were positioned at two (2) locations and set to record the noise levels
SLM: Larson Davis 831 and NTi XL2, Type 1 Sound Level Meters (SLMs)
Settings: A-weighted, slow, both sec-by-sec and 1-hour intervals

Summary of Measurements

Table 1: Summary of Noise Measurement Results

Start	Stop	Location 1			Location 2		
		Leq, dBA	Lmax	Lmin	Leq, dBA	Lmax	Lmin
8:00 AM	9:00 AM	78.5	94.6	55.6	60.8	74.8	45.8
9:00 AM	10:00 AM	76.9	95.8	55.2	61.7	74.6	46.4
10:00 AM	11:00 AM	77.7	91.2	56.0	60.2	74.3	47.4
11:00 AM	12:00 PM	78.2	94.2	56.0	64.8	77.1	46.4
12:00 PM	1:00 PM	79.1	98.0	54.6	59.9	74.1	47.6
1:00 PM	2:00 PM	73.4	90.2	54.0	60.8	76.4	47.9
2:00 PM	3:00 PM	57.4	80.3	54.2	54.1	67.9	49.7

Notes: See field sheets for additional data



AZ Office

4960 S. Gilbert Rd, Ste 1-461
Chandler, AZ 85249
p. (602) 774-1950

CA Office

1197 Los Angeles Ave, Ste C-256
Simi Valley, CA 93065
p. (805) 426-4477

Project: Pet & Mac's Pet Resort - Noise Monitoring, City of
Avondale, AZ

1 = monitoring
locations



Project: Pet & Mac's Pet Resort - Noise Monitoring, City of Avondale, AZ
Client: Pete and Mac's
Site Location: 13034 W Rancho Santa Fe Blvd, Avondale, AZ
Date: 4/26/2017
Engineer: Mike Dickerson
Source/System: Outdoor Play Area

Test Procedure: SLM Location #1
SLM: Larson Davis 831 and NTi XL2, Type 1 Sound Level Meters (SLMs)
Settings: A-weighted, slow, 1-hour, sec-by-sec

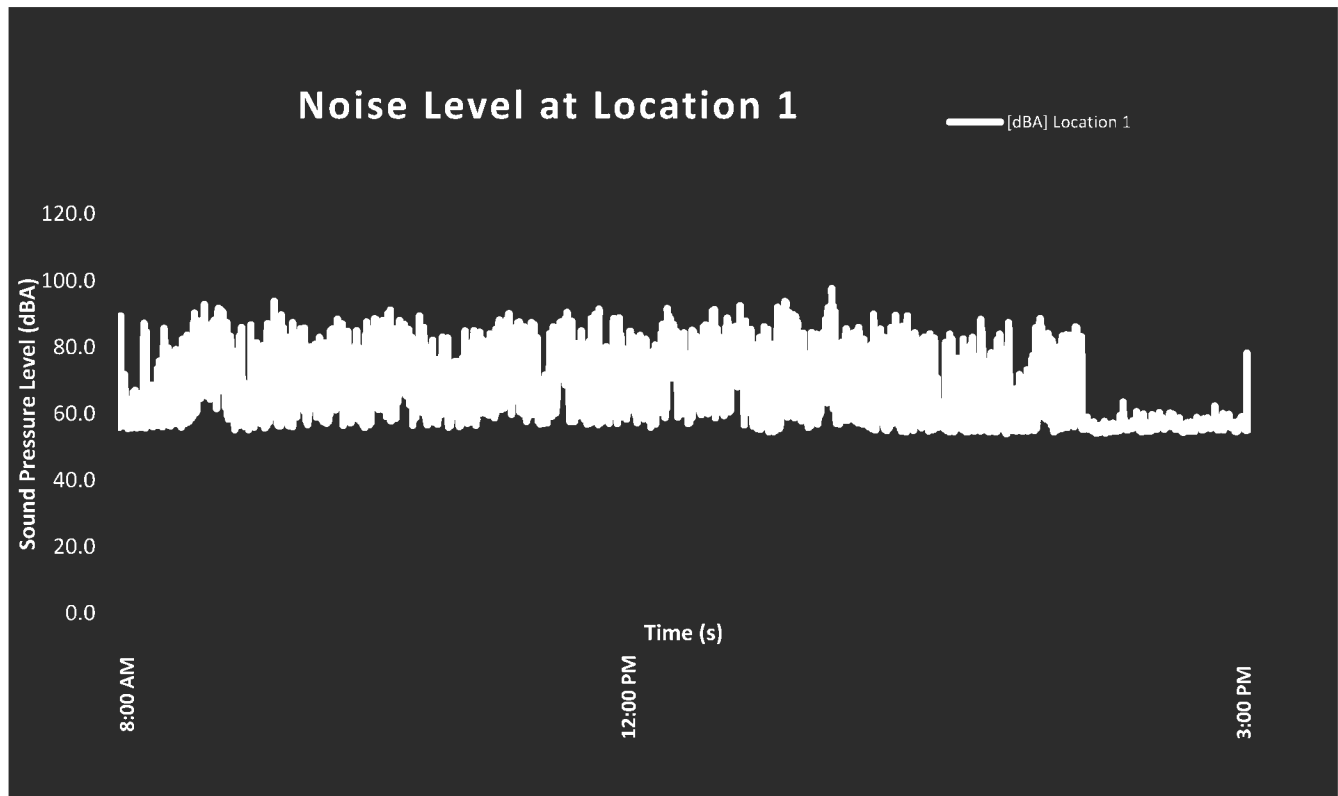
Table 1: Sound Level Measurement Data

Start	Stop	Location 1		
		Leq, dBA	Lmax	Lmin
8:00 AM	9:00 AM	78.5	94.6	55.6
9:00 AM	10:00 AM	76.9	95.8	55.2
10:00 AM	11:00 AM	77.7	91.2	56.0
11:00 AM	12:00 PM	78.2	94.2	56.0
12:00 PM	1:00 PM	79.1	98.0	54.6
1:00 PM	2:00 PM	73.4	90.2	54.0
2:00 PM	3:00 PM	57.4	80.3	54.2

Figure 1: SLM Measurement Location 1 - Looking North



Figure 2: Time History of SPL



Project: Pet & Mac's Pet Resort - Noise Monitoring, City of Avondale, AZ
Client: Pete and Mac's
Site Location: 13034 W Rancho Santa Fe Blvd, Avondale, AZ
Date: 4/26/2017
Engineer: Mike Dickerson
Source/System: Outdoor Play Area

Test Procedure: SLM Location #2
SLM: Larson Davis 831 and NTi XL2, Type 1 Sound Level Meters (SLMs)
Settings: A-weighted, slow, 1-hour, sec-by-sec

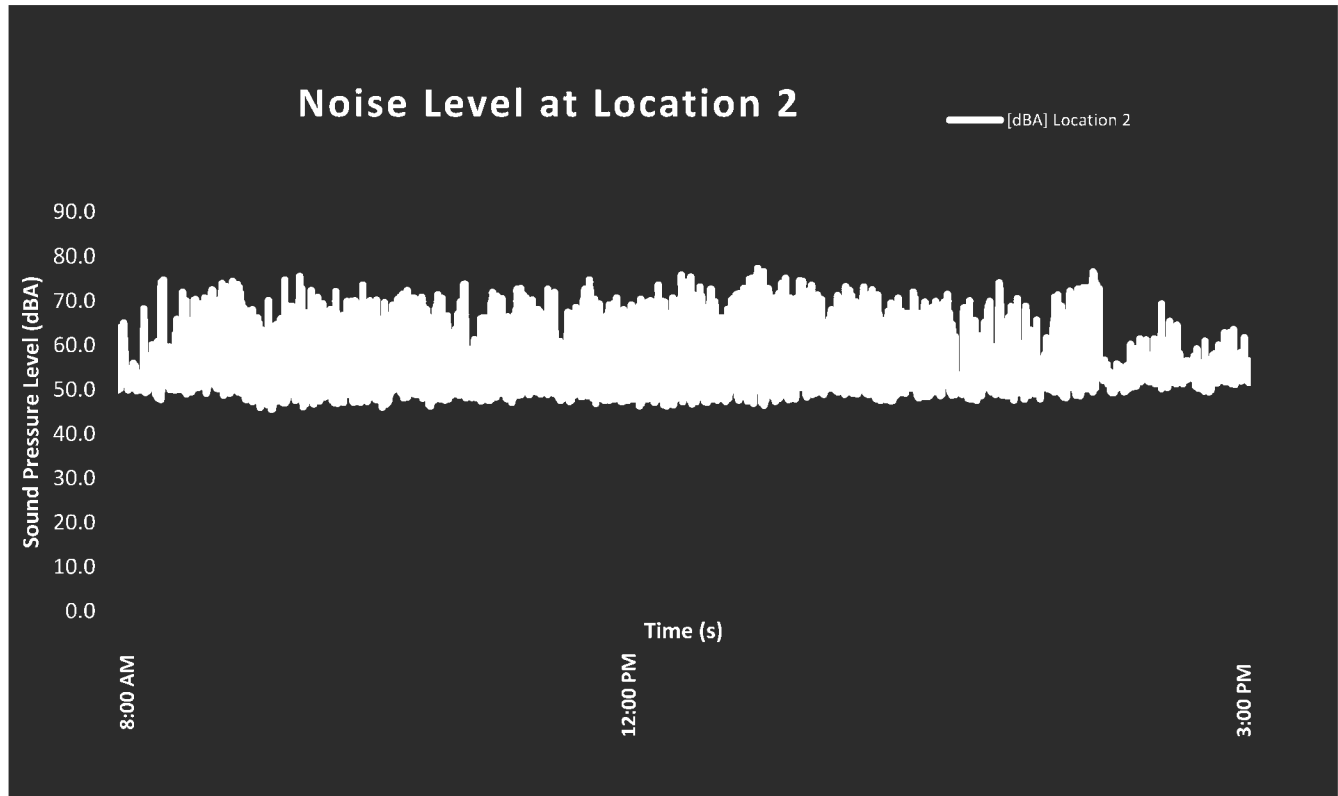
Table 1: Sound Level Measurement Data

Start	Stop	Location 2		
		Leq, dBA	Lmax	Lmin
8:00 AM	9:00 AM	60.8	74.8	45.8
9:00 AM	10:00 AM	61.7	74.6	46.4
10:00 AM	11:00 AM	60.2	74.3	47.4
11:00 AM	12:00 PM	64.8	77.1	46.4
12:00 PM	1:00 PM	59.9	74.1	47.6
1:00 PM	2:00 PM	60.8	76.4	47.9
2:00 PM	3:00 PM	54.1	67.9	49.7

Figure 1: SLM Measurement Location 2 - Looking Southeast



Figure 2: Time History of SPL



Appendix D:
SoundPLAN Inputs/Outputs

Pacific Village San Bernardino

Contribution spectra - 001 - Pacific Village San Bernardino:

Time slice	Source	Sum	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	16kHz	
		dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	
Receiver R1 FIG Lr,lim dB(A) Leq,d 37.3 dB(A)												
Leq,d	Auto Parking	22.9	10.7	18.7	5.9	11.9	15.1	16.3	11.5	-1.9	-31.2	
Leq,d	Auto Parking	17.4	9.5	15.0	3.7	6.3	7.0	4.6	-4.2	-23.2		
Leq,d	Auto Parking	24.7	11.7	20.4	8.1	13.5	17.5	18.2	13.1	-1.2	-35.5	
Leq,d	Dog Barking	17.1	-39.2	-30.5	-11.6	9.1	15.1	10.3	-9.5	-28.7		
Leq,d	Dog Barking	17.0	-39.1	-30.4	-11.7	9.0	15.0	10.3	-9.6	-29.0		
Leq,d	Dog Barking	15.4	-38.9	-30.2	-11.7	9.0	13.0	8.3	-10.8	-27.8		
Leq,d	Dog Barking	18.7	-39.5	-30.9	-13.9	10.0	16.6	12.6	-6.0	-24.6		
Leq,d	Dog Barking	19.1	-39.4	-28.5	-14.0	9.9	17.3	12.6	-6.2	-24.8		
Leq,d	Dog Barking	18.6	-39.4	-30.8	-13.8	8.7	16.7	12.7	-6.4	-25.2		
Leq,d	Dog Park	22.3	-26.9	-18.0	-6.1	14.9	20.1	15.7	-4.0	-25.0		
Leq,d	HVAC	16.2	0.0	5.2	6.3	9.5	11.8	8.9	1.0	-11.8		
Leq,d	HVAC	14.9	-0.6	4.1	5.3	7.9	10.6	7.7	-0.5	-13.9		
Leq,d	HVAC	14.6	-1.3	3.8	4.8	7.9	10.2	7.2	-1.1	-14.7		
Leq,d	HVAC	14.8	-4.0	1.5	3.5	7.5	10.2	9.2	1.6	-13.1		
Leq,d	HVAC	18.3	-0.3	4.9	6.2	10.7	13.9	12.6	6.0	-6.6		
Leq,d	HVAC	15.3	-2.6	3.0	4.8	8.5	10.9	8.9	1.5	-11.9		
Leq,d	HVAC	17.6	-2.5	3.1	4.9	9.9	13.5	11.9	5.0	-8.0		
Leq,d	HVAC	22.4	-1.2	4.5	7.4	13.4	18.3	17.6	12.1	1.0	-32.2	
Leq,d	HVAC	23.4	4.8	10.5	12.3	16.2	18.8	17.2	11.4	1.8	-23.5	
Leq,d	HVAC	17.1	1.6	6.4	7.4	9.9	12.0	10.7	4.4	-9.1		
Leq,d	HVAC	24.8	7.1	12.4	13.5	17.8	20.4	18.4	12.2	2.0	-23.3	
Leq,d	HVAC	35.1	11.1	17.4	19.4	24.6	29.6	30.8	27.2	20.7	2.8	
Leq,d	HVAC	14.6	-4.1	1.5	3.4	7.3	10.0	9.0	1.3	-13.6		
Receiver R2 FIG Lr,lim dB(A) Leq,d 47.4 dB(A)												
Leq,d	Auto Parking	37.5	21.7	31.5	22.5	28.9	30.7	31.1	27.6	18.7	-0.7	
Leq,d	Auto Parking	32.6	16.9	25.6	14.0	22.8	26.8	27.2	21.9	7.0	-28.3	
Leq,d	Auto Parking	40.7	25.5	35.2	26.3	32.1	33.4	33.9	30.6	22.5	5.6	
Leq,d	Dog Barking	35.7	-28.8	-17.7	-3.7	22.6	33.4	31.3	13.8	-3.8		
Leq,d	Dog Barking	35.9	-28.9	-17.9	-3.8	23.4	33.6	31.4	13.9	-4.0		
Leq,d	Dog Barking	35.6	-28.9	-17.9	-3.6	23.6	33.2	31.2	13.8	-4.2		
Leq,d	Dog Barking	31.7	-28.8	-17.8	-4.3	22.2	29.9	25.0	5.4	-13.0		
Leq,d	Dog Barking	31.5	-28.9	-17.2	-4.6	22.2	29.7	25.0	5.4	-13.1		
Leq,d	Dog Barking	31.7	-28.7	-17.7	-4.3	22.3	29.8	25.3	5.7	-13.3		
Leq,d	Dog Park	41.5	-19.6	-7.6	3.6	27.7	39.2	37.1	21.0	3.9		
Leq,d	HVAC	24.8	1.7	7.3	10.3	17.1	20.3	19.5	14.8	5.2	-21.9	
Leq,d	HVAC	23.7	-1.4	4.2	6.8	14.7	19.4	19.4	13.6	2.0	-32.2	
Leq,d	HVAC	22.0	-0.4	5.1	7.4	14.7	17.7	16.6	10.9	-0.3	-32.7	
Leq,d	HVAC	20.3	2.0	7.4	8.9	13.7	16.0	13.8	7.4	-4.2	-35.2	
Leq,d	HVAC	28.5	4.9	10.5	13.1	18.9	23.3	24.3	20.1	12.0	-11.2	
Leq,d	HVAC	28.4	7.2	13.1	14.6	20.9	23.9	22.9	18.0	9.0	-15.9	
Leq,d	HVAC	28.4	7.6	13.4	14.9	20.7	23.8	23.0	18.1	9.2	-15.2	
Leq,d	HVAC	31.4	9.7	15.6	17.6	23.2	26.5	26.3	22.3	15.2	-4.0	
Leq,d	HVAC	28.0	5.8	11.6	13.8	19.1	22.2	22.8	21.0	13.5	-8.5	
Leq,d	HVAC	20.6	0.4	5.3	6.9	13.1	16.2	15.1	9.9	-2.2		
Leq,d	HVAC	21.3	0.5	5.9	8.0	13.6	17.1	15.8	9.5	-2.5	-35.5	
Leq,d	HVAC	26.3	5.3	10.7	12.4	19.2	21.9	20.8	15.5	5.6	-22.0	
Leq,d	HVAC	20.3	1.8	7.2	8.7	13.6	16.0	13.8	7.3	-4.3	-35.6	
Receiver R4 FIG Lr,lim dB(A) Leq,d 47.7 dB(A)												
Leq,d	Auto Parking	21.4	6.6	14.5	4.3	11.9	16.0	15.7	9.0	-10.5		
Leq,d	Auto Parking	33.7	19.6	28.5	17.2	24.1	26.9	27.4	22.9	10.9	-15.9	
Leq,d	Auto Parking	22.2	9.0	16.8	3.9	12.2	16.1	16.0	9.8	-7.6		
Leq,d	Dog Barking	28.1	-28.6	-17.9	-4.8	18.2	26.0	22.7	3.6	-16.4		

Pacific Village San Bernardino
Contribution spectra - 001 - Pacific Village San Bernardino:

Time slice	Source	Sum	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	16kHz	
		dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	
Leq,d	Dog Barking	28.7	-29.1	-18.3	-4.7	18.8	26.5	23.1	3.8	-16.4		
Leq,d	Dog Barking	27.1	-28.9	-18.1	-4.5	19.1	25.1	20.1	-0.4	-19.2		
Leq,d	Dog Barking	37.6	-23.9	-11.6	-1.2	22.2	35.3	33.3	17.2	2.2		
Leq,d	Dog Barking	38.1	-23.9	-11.6	-1.2	23.5	35.8	33.7	17.5	2.4		
Leq,d	Dog Barking	38.3	-23.9	-11.6	-1.2	22.9	36.3	33.5	17.4	2.3		
Leq,d	Dog Park	45.4	-14.7	-2.1	8.7	32.3	43.1	40.8	25.2	11.3		
Leq,d	HVAC	15.4	-4.4	1.0	3.3	8.1	10.9	9.8	3.7	-9.0		
Leq,d	HVAC	13.8	-5.7	-0.2	2.0	6.7	9.4	7.9	1.0	-13.4		
Leq,d	HVAC	15.1	-4.5	0.9	3.2	7.9	10.7	9.3	2.8	-10.5		
Leq,d	HVAC	20.2	-0.1	5.4	7.7	12.6	15.4	14.7	10.0	0.3	-28.2	
Leq,d	HVAC	18.0	-2.5	3.0	5.3	10.1	13.7	12.5	6.8	-4.8		
Leq,d	HVAC	23.0	-1.1	4.6	7.2	13.8	18.7	18.5	12.8	1.6	-31.3	
Leq,d	HVAC	22.9	-1.3	4.4	7.1	13.7	18.7	18.3	12.6	1.3	-32.0	
Leq,d	HVAC	15.4	-3.3	2.1	4.2	8.7	11.1	9.1	1.9	-11.8		
Leq,d	HVAC	18.0	-5.4	0.2	2.9	8.7	13.9	13.7	6.6	-8.2		
Leq,d	HVAC	14.9	-6.4	-0.9	1.3	7.2	11.0	9.6	2.7	-11.8		
Leq,d	HVAC	16.0	-6.8	-1.1	1.5	7.4	12.1	11.2	3.7	-12.1		
Leq,d	HVAC	12.9	-4.3	-1.5	0.8	5.4	8.6	7.4	-0.3	-16.6		
Leq,d	HVAC	20.5	0.1	5.7	7.9	12.9	15.7	15.0	10.4	1.3	-26.0	
Receiver R5 FIG Lr,lim dB(A) Leq,d 54.7 dB(A)												
Leq,d	Auto Parking	21.1	6.2	14.6	6.6	13.0	14.1	14.8	11.3	-4.1		
Leq,d	Auto Parking	35.0	20.3	29.1	21.1	26.0	27.4	28.7	25.7	15.8	-7.4	
Leq,d	Auto Parking	23.2	8.2	16.8	8.8	14.4	15.8	17.3	14.2	-0.4	-36.0	
Leq,d	Dog Barking	39.1	-21.5	-10.5	5.8	30.0	37.0	33.1	15.6	2.8		
Leq,d	Dog Barking	43.3	-20.4	-9.4	9.0	33.7	41.7	36.5	18.2	4.7		
Leq,d	Dog Barking	43.7	-19.5	-8.3	10.1	33.4	41.8	37.9	19.7	5.9		
Leq,d	Dog Barking	44.2	-19.4	-4.7	12.9	35.8	41.9	38.6	23.1	10.8		
Leq,d	Dog Barking	44.8	-18.8	-7.7	13.5	36.4	42.5	39.0	23.3	10.9		
Leq,d	Dog Barking	43.0	-16.4	-3.5	11.9	34.8	40.8	36.9	21.3	8.5		
Leq,d	Dog Park	51.9	-5.9	6.7	21.4	43.8	49.7	45.4	29.4	17.1		
Leq,d	HVAC	19.0	-0.8	4.7	7.0	12.0	14.5	13.3	7.7	-3.3	-35.8	
Leq,d	HVAC	18.5	-1.6	3.9	6.2	11.3	13.8	12.9	7.5	-3.2	-35.9	
Leq,d	HVAC	19.7	-0.1	5.4	7.7	12.7	15.1	13.9	8.3	-2.4	-33.8	
Leq,d	HVAC	18.9	-1.1	4.4	6.7	11.8	14.3	13.2	7.8	-3.0	-35.4	
Leq,d	HVAC	15.6	-3.3	2.1	4.3	9.1	11.2	9.3	2.3	-11.2		
Leq,d	HVAC	19.9	-0.3	5.1	7.5	12.6	15.2	14.3	9.4	-0.5	-30.3	
Leq,d	HVAC	19.4	-0.6	4.9	7.2	12.3	14.8	13.8	8.5	-2.0	-33.4	
Leq,d	HVAC	17.4	-3.1	2.3	4.4	9.0	11.9	13.2	6.8	-7.2		
Leq,d	HVAC	17.4	-3.3	2.2	4.5	9.7	12.5	12.0	7.9	-3.1		
Leq,d	HVAC	15.5	-3.1	2.3	4.5	9.1	11.2	9.0	1.8	-11.8		
Leq,d	HVAC	16.4	-4.5	0.9	2.9	7.5	12.9	11.0	4.2	-10.9		
Leq,d	HVAC	16.2	-4.8	0.6	2.8	7.6	12.0	11.3	4.6	-10.5		
Leq,d	HVAC	19.2	-0.8	4.6	7.0	12.0	14.6	13.5	8.2	-2.4	-34.2	

Pacific Village San Bernardino
Contribution level - 001 - Pacific Village San Bernardino:

9

Source	Source ty	Leq,d dB(A)	
Receiver R1	FIG	Lr,lim dB(A)	Leq,d 37.3 dB(A)
	HVAC	Point	35.1
	Auto Parking	PLot	24.7
	HVAC	Point	24.7
	HVAC	Point	23.3
	Auto Parking	PLot	22.9
	Dog Park	Area	22.4
	HVAC	Point	22.3
	Dog Barking	Point	19.1
	Dog Barking	Point	18.8
	Dog Barking	Point	18.7
	HVAC	Point	18.1
	HVAC	Point	17.5
	Auto Parking	PLot	17.4
	Dog Barking	Point	17.1
	Dog Barking	Point	17.0
	HVAC	Point	17.0
	HVAC	Point	16.1
	Dog Barking	Point	15.5
	HVAC	Point	15.2
	HVAC	Point	14.7
	HVAC	Point	14.7
	HVAC	Point	14.5
	HVAC	Point	14.5
Receiver R2	FIG	Lr,lim dB(A)	Leq,d 47.4 dB(A)
	Dog Park	Area	41.5
	Auto Parking	PLot	40.7
	Auto Parking	PLot	37.5
	Dog Barking	Point	36.0
	Dog Barking	Point	35.8
	Dog Barking	Point	35.7
	Auto Parking	PLot	32.6
	Dog Barking	Point	31.7
	Dog Barking	Point	31.7
	Dog Barking	Point	31.5
	HVAC	Point	31.4
	HVAC	Point	28.5
	HVAC	Point	28.4
	HVAC	Point	28.3
	HVAC	Point	28.0
	HVAC	Point	26.3
	HVAC	Point	24.7
	HVAC	Point	23.7
	HVAC	Point	21.9

Pacific Village San Bernardino
Contribution level - 001 - Pacific Village San Bernardino:

9

Source	Source ty	Leq,d dB(A)	
HVAC	Point	21.2	
HVAC	Point	20.5	
HVAC	Point	20.3	
HVAC	Point	20.2	
Receiver R4 FI G Lr,lim dB(A) Leq,d 47.7 dB(A)			
Dog Park	Area	45.4	
Dog Barking	Point	38.3	
Dog Barking	Point	38.1	
Dog Barking	Point	37.7	
Auto Parking	PLot	33.7	
Dog Barking	Point	28.8	
Dog Barking	Point	28.2	
Dog Barking	Point	27.1	
HVAC	Point	23.0	
HVAC	Point	22.9	
Auto Parking	PLot	22.2	
Auto Parking	PLot	21.4	
HVAC	Point	20.4	
HVAC	Point	20.1	
HVAC	Point	18.0	
HVAC	Point	17.9	
HVAC	Point	15.9	
HVAC	Point	15.3	
HVAC	Point	15.3	
HVAC	Point	15.0	
HVAC	Point	14.9	
HVAC	Point	13.7	
HVAC	Point	12.8	
Receiver R5 FI G Lr,lim dB(A) Leq,d 54.7 dB(A)			
Dog Park	Area	51.9	
Dog Barking	Point	44.9	
Dog Barking	Point	44.3	
Dog Barking	Point	43.8	
Dog Barking	Point	43.4	
Dog Barking	Point	43.1	
Dog Barking	Point	39.2	
Auto Parking	PLot	35.0	
Auto Parking	PLot	23.2	
Auto Parking	PLot	21.1	
HVAC	Point	19.8	
HVAC	Point	19.6	
HVAC	Point	19.4	
HVAC	Point	19.1	
HVAC	Point	19.0	

Pacific Village San Bernardino
Octave spectra of the sources in dB(A) - 001 - Pacific Village San Bernardino: Outdoor SP

3

Name	Source type	I or A m,m²	L'w dB(A)	Lw dB(A)	Day histogram	Emission spectrum	63Hz dB(A)	125Hz dB(A)	250Hz dB(A)	500Hz dB(A)	1kHz dB(A)	2kHz dB(A)	4kHz dB(A)	8kHz dB(A)	16kHz dB(A)	
Auto Parking	PLot	721.77	54.6	83.2	0.24	Typical spectrum	66.6	78.2	70.7	75.2	75.3	75.7	73.0	66.8	54.0	
Auto Parking	PLot	2860.89	55.6	90.1	0.24	Typical spectrum	73.5	85.1	77.6	82.1	82.2	82.6	79.9	73.7	60.9	
Auto Parking	PLot	1087.35	53.9	84.2	0.24	Typical spectrum	67.6	79.2	71.7	76.2	76.3	76.7	74.0	67.8	55.0	
Dog Barking	Point		90.0	90.0	Bark full hour	Dog training facilities	26.3	41.4	58.0	81.3	87.7	83.9	69.9	60.2		
Dog Barking	Point		90.0	90.0	Bark full hour	Dog training facilities	26.3	41.4	58.0	81.3	87.7	83.9	69.9	60.2		
Dog Barking	Point		90.0	90.0	Bark full hour	Dog training facilities	26.3	41.4	58.0	81.3	87.7	83.9	69.9	60.2		
Dog Barking	Point		90.0	90.0	Bark full hour	Dog training facilities	26.3	41.4	58.0	81.3	87.7	83.9	69.9	60.2		
Dog Barking	Point		90.0	90.0	Bark full hour	Dog training facilities	26.3	41.4	58.0	81.3	87.7	83.9	69.9	60.2		
Dog Barking	Point		90.0	90.0	Bark full hour	Dog training facilities	26.3	41.4	58.0	81.3	87.7	83.9	69.9	60.2		
Dog Park	Area	320.07	69.9	95.0	100%/24h	Dog training facilities	31.3	46.4	63.0	86.3	92.7	88.9	74.9	65.2		
HVAC	Point		74.9	74.9	100%/24h	HVAC: 67.7dB @ 3ft - Carrier 50TFQ0006 -	52.0	60.5	62.9	67.2	69.5	69.1	66.1	61.2	48.9	
HVAC	Point		74.9	74.9	100%/24h	HVAC: 67.7dB @ 3ft - Carrier 50TFQ0006 -	52.0	60.5	62.9	67.2	69.5	69.1	66.1	61.2	48.9	
HVAC	Point		74.9	74.9	100%/24h	HVAC: 67.7dB @ 3ft - Carrier 50TFQ0006 -	52.0	60.5	62.9	67.2	69.5	69.1	66.1	61.2	48.9	
HVAC	Point		74.9	74.9	100%/24h	HVAC: 67.7dB @ 3ft - Carrier 50TFQ0006 -	52.0	60.5	62.9	67.2	69.5	69.1	66.1	61.2	48.9	
HVAC	Point		74.9	74.9	100%/24h	HVAC: 67.7dB @ 3ft - Carrier 50TFQ0006 -	52.0	60.5	62.9	67.2	69.5	69.1	66.1	61.2	48.9	
HVAC	Point		74.9	74.9	100%/24h	HVAC: 67.7dB @ 3ft - Carrier 50TFQ0006 -	52.0	60.5	62.9	67.2	69.5	69.1	66.1	61.2	48.9	
HVAC	Point		74.9	74.9	100%/24h	HVAC: 67.7dB @ 3ft - Carrier 50TFQ0006 -	52.0	60.5	62.9	67.2	69.5	69.1	66.1	61.2	48.9	
HVAC	Point		74.9	74.9	100%/24h	HVAC: 67.7dB @ 3ft - Carrier 50TFQ0006 -	52.0	60.5	62.9	67.2	69.5	69.1	66.1	61.2	48.9	
HVAC	Point		74.9	74.9	100%/24h	HVAC: 67.7dB @ 3ft - Carrier 50TFQ0006 -	52.0	60.5	62.9	67.2	69.5	69.1	66.1	61.2	48.9	
HVAC	Point		74.9	74.9	100%/24h	HVAC: 67.7dB @ 3ft - Carrier 50TFQ0006 -	52.0	60.5	62.9	67.2	69.5	69.1	66.1	61.2	48.9	
HVAC	Point		74.9	74.9	100%/24h	HVAC: 67.7dB @ 3ft - Carrier 50TFQ0006 -	52.0	60.5	62.9	67.2	69.5	69.1	66.1	61.2	48.9	
HVAC	Point		74.9	74.9	100%/24h	HVAC: 67.7dB @ 3ft - Carrier 50TFQ0006 -	52.0	60.5	62.9	67.2	69.5	69.1	66.1	61.2	48.9	

Appendix E:
Construction Noise Modeling Output

Receptor - Residences to the south

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA ¹	Edge of Site to Receptor, feet	Center of Site to Receptor, feet	Item Usage Percent ¹	Ground Factor ²	Usage Factor	Receptor Item Lmax, dBA	Receptor Item L _{eq} , dBA
DEMO									
Excavator	3	81	15	225	40	0	0.40	91.5	64.0
Dozer	2	82	15	225	40	0	0.40	92.5	65.0
Concrete Saw	1	90	15	225	20	0	0.20	100.5	69.9
Tractor	0	84	15	225	40	0	0.40	0.0	0.0
							Log Sum	100.5	71.4
PILE PREP									
Grader	0	85	15	225	40	0	0.40	0.0	0.0
Tractor	4	84	15	225	40	0	0.40	94.5	67.0
Dozer	3	82	15	225	40	0	0.40	92.5	65.0
Scraper	0	84	15	225	40	0	0.40	0.0	0.0
							Log Sum	94.5	73.0
GRADE									
Dozer	1	82	15	225	40	0	0.40	92.5	65.0
Tractor	3	84	15	225	40	0	0.40	94.5	67.0
Grader	1	85	15	225	40	0	0.40	95.5	68.0
Excavator	1	81	15	225	40	0	0.40	91.5	64.0
Scraper	0	84	15	225	40	0	0.40	0.0	0.0
								95.5	73.8
BUILD									
Crane	1	81	15	225	16	0	0.16	91.5	60.0
Man lift	3	75	15	225	20	0	0.20	85.5	54.9
Tractor	3	84	15	225	40	0	0.40	94.5	67.0
Welder/Torch	1	74	15	225	40	0	0.40	84.5	57.0
Generator	1	81	15	225	50	0	0.50	91.5	64.9
								94.5	73.1
PAVE									
Paver	1	77	15	225	50	0	0.50	87.5	60.9
Concrete Mixer Truck	2	79	15	225	40	0	0.40	89.5	62.0
Roller	2	80	15	225	20	0	0.20	90.5	59.9

Tractor	1	84	15	225	40	0	0.40	94.5	67.0
Compressor (ground)	2	83	15	225	20	0	0.20	93.5	62.9
								94.5	70.1
ARCH COAT									
Compressor (air)	1	78	15	225	40	0	0.40	88.5	61.0
								88.5	61.0

EMMA Construction Noise Handbook Table 9.1 RCNM (dBA) Noise Emission Estimates, Levels and Usage Factors

VIBRATION LEVEL IMPACT

Project: Pacific Village Date: 5/30/24
Source: Vibratory Roller
Scenario: Unmitigated
Location: Adjacent residences
Address: San Bernardino
PPV = $PPV_{ref}(25/D)^n$ (in/sec)

DATA INPUT

Equipment = 1 Vibratory Roller INPUT SECTION IN BLUE
Type
PPVref = 0.21 Reference PPV (in/sec) at 25 ft.
D = 55.00 Distance from Equipment to Receiver (ft)
n = 1.10 Vibration attenuation rate through the ground

Note: Based on reference equations from Vibration Guidance Manual, California Department of Transportation, 2006, pgs 38-43.

DATA OUT RESULTS

PPV = 0.088 IN/SEC OUTPUT IN RED