

915 9th St Residential Project

Noise Impact Study

County of San Diego, CA

Prepared for:

Matthew Esquivel
Warmington Residential
3090 Pullman Street
Costa Mesa, CA 92626

Prepared by:

MD Acoustics, LLC
Mike Dickerson, Principal Acoustical Consultant
Naomi Jensen, Acoustical Consultant
1197 Los Angeles Ave, Ste C-256
Simi Valley, CA 93065

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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-Borne Vibration Fundamentals	9
3.1	Vibration Descriptors	9
3.2	Vibration Perception	9
4.0	Regulatory Setting.....	11
4.1	Federal Regulations	11
4.2	State Regulations	11
4.3	San Diego County Noise Regulations	12
5.0	Study Method and Procedure.....	19
5.1	Noise Measurement Procedure and Criteria	19
5.2	Noise Measurement Locations	19
5.3	FHWA Traffic Noise Prediction Model	19
5.4	Interior Noise Modeling	20
5.5	FHWA Roadway Construction Noise Model	21
6.0	Existing Noise Environment	23
6.1	Long-Term Noise Measurement Results	23
7.0	Future Noise Environment Impacts and Mitigation	24
7.1	Future Off-Site Exterior Noise	24
7.1.1	Future Off-Site Traffic Noise Impact	24
7.1.2	Noise Impacts to Off-Site Receptors Due to Stationary Sources	25
7.2	Future On-Site Noise	26
7.2.1	Future On-Site Exterior Noise Impact	26
7.2.2	Future On-Site Interior Noise Impact	28
7.3	Project Design Features	28
8.0	Construction Noise Impact	29
8.1	Construction Noise	29

8.2	Construction Vibration	30
9.0	CEQA Consistency	33
10.0	References	34

LIST OF APPENDICES

Appendix A:	Photographs and Field Measurement Data	1
Appendix B:	Traffic Noise Modeling Output	2
Appendix C:	HVAC Reference Sheets	3
Appendix D:	Construction Noise Modeling Output	4

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	12
Exhibit E:	Noise Standards	13
Exhibit F:	Measurement Locations	22
Exhibit G:	Proposed Wall Locations	27

LIST OF TABLES

Table 1:	Roadway Parameters and Vehicle Distribution	20
Table 2:	Long-Term Noise Measurement Data, NM1 ¹	23
Table 3:	Long-Term Noise Measurement Data, NM2 ¹	23
Table 4:	Existing/Existing + Project Scenario – Noise Levels Along Roadways (dBA CNEL)	25
Table 5:	Future Interior Noise Levels (dBA CNEL)	28
Table 6:	Typical Construction Noise Levels ¹	29
Table 7:	Construction Noise Levels at Residences to the North	30
Table 8:	Guideline Vibration Damage Potential Threshold Criteria	31
Table 9:	Vibration Source Levels for Construction Equipment ¹	31

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 County's Noise Guidelines, the project must demonstrate compliance with the applicable noise criterion as outlined within the County'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 from the project site
- An analysis of construction noise impacts

1.2 Site Location and Study Area

The project site is located at 915 9th Street in San Diego County, as shown in Exhibit A. Land uses surrounding the site include Village Residential (VR-15) to the north and west and Village Residential (VR-2) to the east, south, and west. 9th Street is to the east, and 10th Street (San Vicente Road) is to the west.

1.3 Proposed Project Description

The 915 9th Street Project (Project) is located at 915 9th Street in the unincorporated community of Ramona, San Diego County, California. The Project site encompasses approximately 19.65 acres and includes four parcels identified as Assessor Parcel Numbers (APNs) 284-202-21, 284-203-08, 284-205-01, and 284-244-01.

The Project proposes a residential subdivision consisting of 88 single-family residential lots and 12 lettered lots for private streets, open space, drainage, water quality, utility, and related infrastructure purposes. Development is proposed on APNs 284-202-21, 284-203-08, and 284-244-01. APN 284-205-01 is not proposed for physical development and would remain as a remainder parcel; however, its allowable residential density is proposed to be transferred to the Project.

The Project site is largely undeveloped, with the exception of an existing single-family residence and barn located in the northeastern portion of the property. The existing residence is proposed to remain, while the barn would be demolished. Surrounding land uses are primarily residential and include nearby single-family residences and a school.

The Project includes construction of single-family homes, internal private streets, sidewalks, utilities, stormwater infrastructure, and associated site improvements. Access to the Project would be provided

from 9th Street via a system of private internal streets. The Project also includes the proposed vacation of a portion of 10th Street and installation of a gated Emergency Vehicle Access (EVA) connection.

The Project is located within the Ramona Community Plan and includes development within the Village Residential 7.3 (VR-7.3) and Village Residential 2 (VR-2) General Plan land use designations. Water and sewer service would be provided by the Ramona Municipal Water District.

The site plan for the project is illustrated in Exhibit B. This study assesses the operational noise and roadway traffic noise to and from the project site and compares the results to the applicable County noise standards. In addition, the study reviews noise generated by construction activities. Construction activities within the project area will consist of demolition, site preparation, grading, building, paving, and architectural coating.

Exhibit A Location Map



Exhibit B Site Plan



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 the 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.

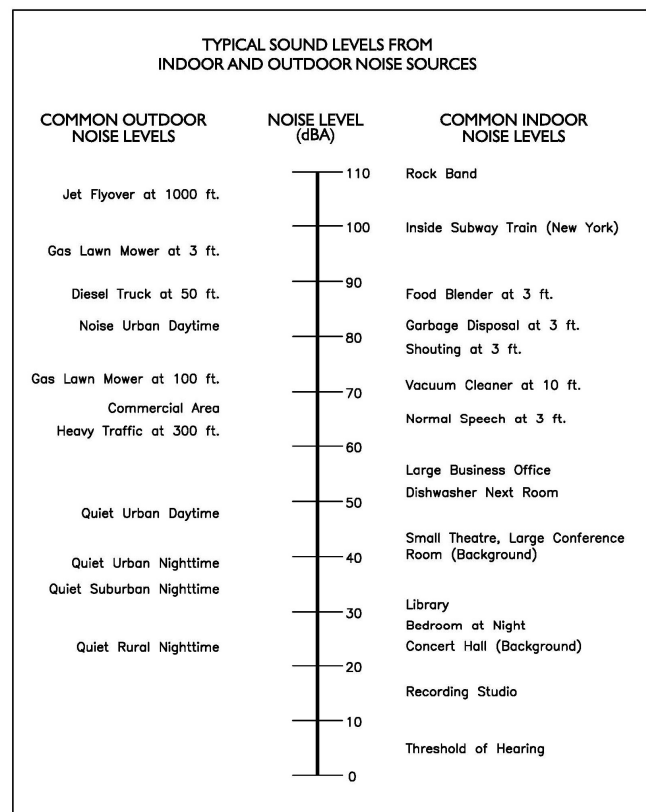
2.2 Frequency and Hertz

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 inch 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 a 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 depend on a variety of factors: (1) volume of traffic, (2) speed of traffic, (3) auto, medium truck (2 axle), and heavy truck percentage (3 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 or more 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 San Diego County, California 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 County 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 regularity 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 and the California Building Code (CBC), 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.

4.3 San Diego County Noise Regulations

The San Diego County outlines its noise regulations and standards within the Noise Element from the General Plan and the Noise Ordinance from the Code of Regulatory Ordinances.

San Diego County General Plan

The San Diego County General Plan describes the major noise sources and defines the goals and policies to include noise control in the planning process to maintain compatible land uses with acceptable environmental noise levels. The noise element outlines 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 (Table N-1 from General Plan).

Exhibit D: Land Use Compatibility Guidelines

Table N-1 Noise Compatibility Guidelines								
Land Use Category		Exterior Noise Level (CNEL)						
			55	60	65	70	75	80
A	Residential—single family residences, mobile homes, senior housing, convalescent homes							
B	Residential—multi-family residences, mixed-use (commercial/residential)							
C	Transient lodging—motels, hotels, resorts							
D*	Schools, churches, hospitals, nursing homes, child care facilities							
E*	Passive recreational parks, nature preserves, contemplative spaces, cemeteries							
F*	Active parks, golf courses, athletic fields, outdoor spectator sports, water recreation							
G*	Office/professional, government, medical/dental, commercial, retail, laboratories							
H*	Industrial, manufacturing, utilities, agriculture, mining, stables, ranching, warehouse, maintenance/repair							
	ACCEPTABLE—Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal construction, without any special noise insulation requirements.							
	CONDITIONALLY ACCEPTABLE—New construction or development should be undertaken only after a detailed noise analysis is conducted to determine if noise reduction measures are necessary to achieve acceptable levels for land use. Criteria for determining exterior and interior noise levels are listed in Table N-2, Noise Standards. If a project cannot mitigate noise to a level deemed Acceptable, the appropriate county decision-maker must determine that mitigation has been provided to the greatest extent practicable or that extraordinary circumstances exist.							
	UNACCEPTABLE—New construction or development shall not be undertaken.							

* Denotes facilities used for part of the day; therefore, an hourly standard would be used rather than CNEL (refer to Table N-2).

The San Diego County General Plan also includes exterior and interior noise standards based on land use, presented in Exhibit E (Table N-2 from the General Plan).

Exhibit E: Noise Standards

Table N-2 Noise Standards ^{Note}
1. The exterior noise level (as defined in Item 3) standard for Category A shall be 60 CNEL, and the interior noise level standard for indoor habitable rooms shall be 45 CNEL.
2. The exterior noise level standard for Categories B and C shall be 65 CNEL, and the interior noise level standard for indoor habitable rooms shall be 45 CNEL.
3. The exterior noise level standard for Categories D and G shall be 65 CNEL and the interior noise level standard shall be 50 dBA L_{eq} (one hour average).
4. For single-family detached dwelling units, "exterior noise level" is defined as the noise level measured at an outdoor living area which adjoins and is on the same lot as the dwelling, and which contains at least the following minimum net lot area: (i) for lots less than 4,000 square feet in area, the exterior area shall include 400 square feet, (ii) for lots between 4,000 square feet to 10 acres in area, the exterior area shall include 10 percent of the lot area; (iii) for lots over 10 acres in area, the exterior area shall include 1 acre.
5. For all other residential land uses, "exterior noise level" is defined as noise measured at exterior areas which are provided for private or group usable open space purposes. "Private Usable Open Space" is defined as usable open space intended for use of occupants of one dwelling unit, normally including yards, decks, and balconies. When the noise limit for Private Usable Open Space cannot be met, then a Group Usable Open Space that meets the exterior noise level standard shall be provided. "Group Usable Open Space" is defined as usable open space intended for common use by occupants of a development, either privately owned and maintained or dedicated to a public agency, normally including swimming pools, recreation courts, patios, open landscaped areas, and greenbelts with pedestrian walkways and equestrian and bicycle trails, but not including off-street parking and loading areas or driveways.
6. For non-residential noise sensitive land uses, exterior noise level is defined as noise measured at the exterior area provided for public use.
7. For noise sensitive land uses where people normally do not sleep at night, the exterior and interior noise standard may be measured using either CNEL or the one-hour average noise level determined at the loudest hour during the period when the facility is normally occupied.
8. The exterior noise standard does not apply for land uses where no exterior use area is proposed or necessary, such as a library.
9. For Categories E and F the exterior noise level standard shall not exceed the limit defined as "Acceptable" in Table N-1 or an equivalent one-hour noise standard.

Note: Exterior Noise Level compatibility guidelines for Land Use Categories A-H are identified in Table N-1, Noise Compatibility Guidelines.

The following principles or goals, which are not in order of priority, provide the foundation for the detailed policies in subsequent sections; all policies have been established to be in conformity with the guiding principles and goals. Future actions of the County following adoption of the plan are required to be consistent with these policies:

County Goals and Policies

GOAL N-1

Land Use Compatibility. A noise environment throughout the unincorporated County that is compatible with the land uses.

Policies

- N-1.1 Noise Compatibility Guidelines.** Use the Noise Compatibility Guidelines (Table N-1) and the Noise Standards (Table N-2) as a guide in determining the acceptability of exterior and interior noise for proposed land uses.
- N-1.2 Noise Management Strategies.** Require the following strategies as higher priorities than construction of conventional noise barriers where noise abatement is necessary:
- Avoid placement of noise sensitive uses within noisy areas
 - Increase setbacks between noise generators and noise sensitive uses
 - Orient buildings such that the noise sensitive portions of a project are shielded from noise sources
 - Use sound-attenuating architectural design and building features
 - Employ technologies when appropriate that reduce noise generation (i.e. alternative pavement materials on roadways)
- N-1.3 Sound Walls.** Discourage the use of noise walls. In areas where the use of noise walls cannot be avoided, evaluate and require where feasible, a combination of walls and earthen berms and require the use of vegetation or other visual screening methods to soften the visual appearance of the wall.
- N-1.4 Adjacent Jurisdiction Noise Standards.** Incorporate the noise standards of an adjacent jurisdiction into the evaluation of a proposed project when it has the potential to impact the noise environment of that jurisdiction.
- N-1.5 Regional Noise Impacts.** Work with local and regional transit agencies and/or other jurisdictions, as appropriate, to provide services or facilities to minimize regional traffic noise and other sources of noise in the County.

GOAL N-2

Protection of Noise Sensitive Uses. A noise environment that minimizes exposure of noise sensitive land uses to excessive, unsafe, or otherwise disruptive noise levels.

Policies

- N-2.1 Development Impacts to Noise Sensitive Land Uses.** Require an acoustical study to identify inappropriate noise level where development may directly result in any existing or future noise sensitive land uses being subject to noise levels equal to or greater than 60 CNEL and require mitigation for sensitive uses in compliance with the noise standards listed in Table N-2.
- N-2.2 Balconies and Patios.** Assure that in developments where the exterior noise level on patios or balconies for multi-family residences or mixed-use developments exceed 65 CNEL, a

solid noise barrier is incorporated into the building design of the balconies and patios while still maintaining the openness of the patio or balcony.

GOAL N-3

Groundborne Vibration. An environment that minimizes exposure of sensitive land uses to the harmful effects of excessive groundborne vibration.

Policy

- N-3.1 Groundborne Vibration.** Use the Federal Transit Administration and Federal Railroad Administration guidelines, where appropriate, to limit the extent of exposure that sensitive uses may have to groundborne vibration from trains, construction equipment, and other sources.

GOAL N-5

Non-transportation-Related Noise Sources. A noise environment that provides minimal noise spillovers from industrial, commercial, agricultural, extractive, and similar facilities to adjacent residential neighborhoods.

Policies

- N-5.1 Truck Access.** Design development so that automobile and truck access to industrial and commercial properties abutting residential properties is located at the maximum practical distance from residential zones.
- N-5.2 Noise-Generating Industrial Facilities.** Locate noise-generating industrial facilities at the maximum practical distance from residential zones. Use setbacks between noise generating equipment and noise sensitive uses and limit the operation of noise generating activities to daytime hours as appropriate where such activities may affect residential uses.

GOAL N-6

Temporary and/or Nuisance Noise. Minimal effects of intermittent, short-term, or other nuisance noise sources to noise sensitive land uses.

Policies

- N-6.1 Noise Regulations.** Develop and regularly update codes and ordinances as necessary to regulate impacts from point, intermittent, and other disruptive noise sources.
- N-6.2 Recurring Intermittent Noise.** Minimize impacts from noise in areas where recurring intermittent noise may not exceed the noise standards listed in Table N-2, but can have other adverse effects.

- N-6.3 High-Noise Equipment.** Require development to limit the frequency of use of motorized landscaping equipment, parking lot sweepers, and other high-noise equipment if their activity will result in noise that affects residential zones.
- N-6.4 Hours of Construction.** Require development to limit the hours of operation as appropriate for non-emergency construction and maintenance, trash collection, and parking lot sweeper activity near noise sensitive land uses.
- N-6.5 Special Events.** Schedule special events sponsored by the County that may generate excessive noise levels to daytime hours when feasible.

San Diego County Code of Regulatory Ordinances

San Diego County establishes noise limits in Section 36 of the Code of Regulatory Ordinances.

SEC. 36.404. GENERAL SOUND LEVEL LIMITS.

- (a) Except as provided in section 36.409 of this chapter, it shall be unlawful for any person to cause or allow the creation of any noise, which exceeds the one-hour average sound level limits in Table 36.404, when the one-hour average sound level is measured at the property line of the property on which the noise is produced or at any location on a property that is receiving the noise.

Table 36.404: Sound Level Limits in Decibels (dBA)

Zone	Time	One-Hour Average Sound Level Limits (dBA)
(1) RS, RD, RR, RMH, A70, A72, S80, S81, S87, S90, S92 and RV and RU with a density of less than 11 dwelling units per acre.	7 a.m. to 10 p.m.	50
	10 p.m. to 7 a.m.	45
(2) RRO, RC, RM, S86, V5 and RV and RU with a density of 11 or more dwelling units per acre.	7 a.m. to 10 p.m.	55
	10 p.m. to 7 a.m.	50
(3) S94, V4 and all commercial zones.	7 a.m. to 10 p.m.	60
	10 p.m. to 7 a.m.	55
(4) V1, V2 V1, V2 V1 V2 V3	7 a.m. to 7 p.m.	60
	7 p.m. to 10 p.m.	55
	10 p.m. to 7 a.m.	55
	10 p.m. to 7 a.m.	50
	7 a.m. to 10 p.m.	70
	10 p.m. to 7 a.m.	65
(5) M50, M52 and M54	Anytime	70
(6) S82, M56 and M58.	Anytime	75
(7) S88 (see subsection (c) below)		

- (b) Where a noise study has been conducted and the noise mitigation measures recommended by that study have been made conditions of approval of a Major Use Permit, which authorizes the noise-generating use or activity and the decision making body approving the Major Use Permit determined that those mitigation measures reduce potential noise impacts to a level below significance, implementation and compliance with those noise mitigation measures shall constitute compliance with subsection (a) above.
- (c) S88 zones are Specific Planning Areas which allow different uses. The sound level limits in Table 36.404 above that apply in an S88 zone depend on the use being made of the property. The limits in Table 36.404, subsection (1) apply to property with a residential, agricultural or civic use. The limits in subsection (3) apply to property with a commercial use. The limits in subsection (5) apply to property with an industrial use that would only be allowed in an M50, M52 or M54 zone. The limits in subsection (6) apply to all property with an extractive use or a use that would only be allowed in an M56 or M58 zone.
- (d) If the measured ambient noise level exceeds the applicable limit in Table 36.404, the allowable one-hour average sound level shall be the one-hour average ambient noise level, plus three decibels. The ambient noise level shall be measured when the alleged noise violation source is not operating.
- (e) The sound level limit at a location on a boundary between two zones is the arithmetic mean of the respective limits for the two zones. The one-hour average sound level limit applicable to extractive industries, however, including but not limited to borrow pits and mines, shall be 75 decibels at the property line regardless of the zone in which the extractive industry is located.
- (f) A fixed-location public utility distribution or transmission facility located on or adjacent to a property line shall be subject to the sound level limits of this section measured at or beyond six feet from the boundary of the easement upon which the facility is located.

SEC. 36.408. HOURS OF OPERATION OF CONSTRUCTION EQUIPMENT.

Except for emergency work, it shall be unlawful for any person to operate or cause to be operated, construction equipment:

- (a) Between 7 p.m. and 7 a.m.
- (b) On a Sunday or a holiday. For purposes of this section, a holiday means January 1st, the last Monday in May, July 4th, the first Monday in September, the fourth Thursday in November and December 25th. A person may, however, operate construction equipment on a Sunday or holiday between the hours of 10 a.m. and 5 p.m. at the person's residence or for the purpose of constructing a residence for himself or herself, provided that the operation of construction equipment is not carried out for financial consideration or other consideration of any kind and does not violate the limitations in sections 36.409 and 36.410.

SEC. 36.409. SOUND LEVEL LIMITATIONS ON CONSTRUCTION EQUIPMENT.

Except for emergency work, it shall be unlawful for any person to operate construction equipment or cause construction equipment to be operated, that exceeds an average sound level of 75 decibels for an eight-hour period, between 7 a.m. and 7 p.m., when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is being received.

SEC. 36.413. MULTIPLE FAMILY DWELLING UNITS.

Notwithstanding any other provision of this chapter it shall be unlawful for any person to create, maintain or cause to be maintained any sound within the interior of any multiple family dwelling unit which causes the noises level to exceed those limits set forth below in another dwelling unit:

Table 36.413: Allowable Interior Noise Level

Type of Land Use	Hours		Allowable Interior Noise Level (dBA)	
		No Time	1 min in 1 hour	5 min in 1 hour
Multifamily Residential	10 pm- 7 am	> 45	40	35
	7 am-10 pm	> 55	50	35

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 the 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, lawnmowers, 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) long-term 8-hour noise measurements were conducted at the Project site. Appendix A includes photos, the field sheet, and measured noise data. Exhibit F illustrates the location of the measurement.

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 project trip generation data correspond to Traffic Impact Analysis prepared for this project by LLG Engineers. 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 outermost 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 throughout 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
9 th Street	South of Main St	1,000	1,480	25	Hard
10 th Street	South of Main St	7,650	7,820	40	Hard
11 th Street	South of Main St	7,030	7,070	30	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	97.5
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 Traffic Impact Analysis prepared for this Project by LLG Engineers.					
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 characterize 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 Interior Noise Modeling

The interior noise level is the difference between the projected exterior noise level at the structure's facade and the noise reduction provided by the structure itself. The exterior noise level was projected from expected traffic conditions from each adjacent roadway. Typical building construction will provide a conservative 12 dBA noise level reduction with a "windows open" condition and a very conservative 20 dBA noise level reduction with "windows closed". MD estimated the interior noise level by subtracting the building shell design from the predicted exterior noise level.

5.5 FHWA Roadway Construction Noise Model

The construction noise analysis utilizes the Federal Highway Administration (FHWA) Roadway Construction Noise Model (RNCM), together with several key construction parameters. Key inputs include distance to the sensitive receiver, equipment usage, % usage factor, and baseline parameters for the project site.

The project was analyzed based on the different construction phases. The construction noise calculation output worksheet is in Appendix D.

Exhibit F

Measurement Locations

= Long-Term
Monitoring Location



6.0 Existing Noise Environment

Two (2) long-term 8-hour noise measurements were conducted at the project site to document the existing noise environment. The measurements include Leq, Lmin, Lmax, and other statistical data (e.g., L2, L8). Noise measurement field sheets are provided in Appendix A.

6.1 Long-Term Noise Measurement Results

The results of the long-term noise data are presented in Tables 2 and 3.

Table 2: Long-Term Noise Measurement Data, NM1¹

Date	Start	Stop	1-Hour dB(A)							
			L _{EQ}	L _{MAX}	L _{MIN}	L ₂	L ₈	L ₂₅	L ₅₀	L ₉₀
6/20/2025	7:00 AM	8:00 AM	59.4	82.2	38.5	65.1	62.5	59.3	57.6	53.8
6/20/2025	8:00 AM	9:00 AM	58.7	75.8	36.5	64.7	61.6	58.9	57.4	54.0
6/20/2025	9:00 AM	10:00 AM	60.9	87.1	38.0	66.5	64.6	59.6	57.2	53.9
6/20/2025	10:00 AM	11:00 AM	57.8	75.5	36.6	63.2	60.5	58.6	56.5	52.9
6/20/2025	11:00 AM	12:00 PM	57.6	76.9	39.2	62.9	61.9	58.0	56.0	53.1
6/20/2025	12:00 PM	1:00 PM	58.9	80.3	37.4	66.2	62.5	59.0	56.8	53.1
6/20/2025	1:00 PM	2:00 PM	59.5	81.3	40.8	65.7	62.6	60.0	56.9	54.1
6/20/2025	2:00 PM	3:00 PM	60.0	86.6	41.0	62.3	60.1	58.5	56.8	53.0
Estimated CNEL			62.9							
Notes: ¹ Long-term noise monitoring location (NM1) is illustrated in Exhibit F.										

Table 3: Long-Term Noise Measurement Data, NM2¹

Date	Start	Stop	1-Hour dB(A)							
			L _{EQ}	L _{MAX}	L _{MIN}	L ₂	L ₈	L ₂₅	L ₅₀	L ₉₀
6/20/2025	7:00 AM	8:00 AM	58.3	82.1	37.2	64.9	61.0	57.6	48.0	44.9
6/20/2025	8:00 AM	9:00 AM	56.3	78.2	38.4	62.6	61.5	57.9	48.4	43.9
6/20/2025	9:00 AM	10:00 AM	55.4	76.9	36.8	62.9	59.5	56.6	48.9	42.9
6/20/2025	10:00 AM	11:00 AM	53.2	72.8	37.0	60.5	57.9	54.9	45.9	42.1
6/20/2025	11:00 AM	12:00 PM	55.0	73.8	40.7	61.9	59.0	56.8	52.1	45.0
6/20/2025	12:00 PM	1:00 PM	57.7	84.8	38.7	65.6	61.3	57.8	53.6	44.2
6/20/2025	1:00 PM	2:00 PM	55.1	75.1	42.2	60.8	59.2	56.7	51.6	47.6
6/20/2025	2:00 PM	3:00 PM	56.0	77.9	41.9	61.6	59.6	57.4	54.8	48.4
Estimated CNEL			59.1							
Notes: ¹ Long-term noise monitoring location (NM2) is illustrated in Exhibit F.										

Noise data indicate the ambient noise level ranged from 59 to 63 dBA CNEL at the project site. Evening and nighttime levels used to calculate the CNEL at each measurement location were predicted using typical California traffic conditions. Additional field notes, photographs, and CNEL calculations are provided in Appendix A.

7.0 Future Noise Environment Impacts and Mitigation

This assessment analyzes future noise impacts from the project and compares the results to the County's Noise Standards. The analysis details the estimated exterior noise levels associated with traffic from adjacent roadway sources.

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 a distance of 45 feet from 9th Street, 60 feet from 10th Street, and 50 feet from 11th Street. These distances are representative of approximate distances to existing single-family homes closest to the subject roadways impacted by the project. The distance to the 55, 60, 65, and 70 dBA CNEL noise contours are also provided for reference. The noise contours were calculated for the following scenarios and conditions:

- Existing Condition: This scenario refers to the existing traffic noise condition and is demonstrated in Table 4.
- Existing + Project Condition: This scenario refers to the existing plus project traffic noise condition and is demonstrated in Table 4.

<Table 4, next page>

Table 4: Existing/Existing + Project Scenario – Noise Levels Along Roadways (dBA CNEL)

Existing Exterior Noise Levels

Roadway	Segment	CNEL from C/L to Existing Residences (dBA)	Distance to Contour (Ft)			
			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
9 th Street	South of Main St	52.3	1	2	8	24
10 th Street	South of Main St	64.7	18	56	178	563
11 th Street	South of Main St	62.1	8	26	81	256

Existing + Project Exterior Noise Levels

Roadway	Segment	CNEL from C/L to Existing Residences (dBA)	Distance to Contour (Ft)			
			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
9 th Street	South of Main St	54.0	1	4	11	36
10 th Street	South of Main St	64.8	18	58	182	575
11 th Street	South of Main St	62.1	8	26	82	258

Change in Noise Levels as a Result of Projects

Roadway ¹	Segment	CNEL from C/L to Existing Residences dBA ²			
		Existing Without Project	Existing With Project	Change in Noise Level	Potential Significant Impact
9 th Street	South of Main St	52.3	54.0	1.7	No
10 th Street	South of Main St	64.7	64.8	0.1	
11 th Street	South of Main St	62.1	62.1	0.0	
Notes: ¹ Exterior noise levels calculated at 5 feet above ground level. ² Noise levels calculated from centerline of subject roadway to existing residences.					

Table 4 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, the addition of the project will cause a 0.1 to 1.7 dBA increase in traffic noise at the nearest residences from the centerlines of the three subject roadways. This will be inaudible (see Section 2.5), and therefore, the impact is less than significant, and no mitigation is required.

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

On-site operational noise includes HVAC equipment. Each single-family home is assumed to have one 5-ton HVAC unit on a concrete slab in the backyard. Each HVAC unit is assumed to operate 24 hours a day. Equipment will be an average of 400 feet away from the closest adjacent residential use to the north. The maximum sound power level from a single unit is 78 dBA. At the nearest existing residence to the

north, the sound pressure level from all ~~85-88~~ operating HVAC units is estimated to be 45 dBA. This is a conservative estimate, as most of the HVAC units will be shielded by the project's residential buildings. Thus, the maximum HVAC sound level at the adjacent residential receivers will be up to 45 dBA Leq. This noise level does not exceed the 45 dBA Leq nighttime noise limit for residential uses outlined by the San Diego County General Plan. Thus, the impact of project operational noise is less than significant. See Appendix C.

7.2 Future On-Site Noise

The future noise level on-site of the project will be impacted by transportation-related sources, including roadway traffic from 9th Street, 10th Street, and 11th Street. The following outlines the on-site noise impacts associated with the project.

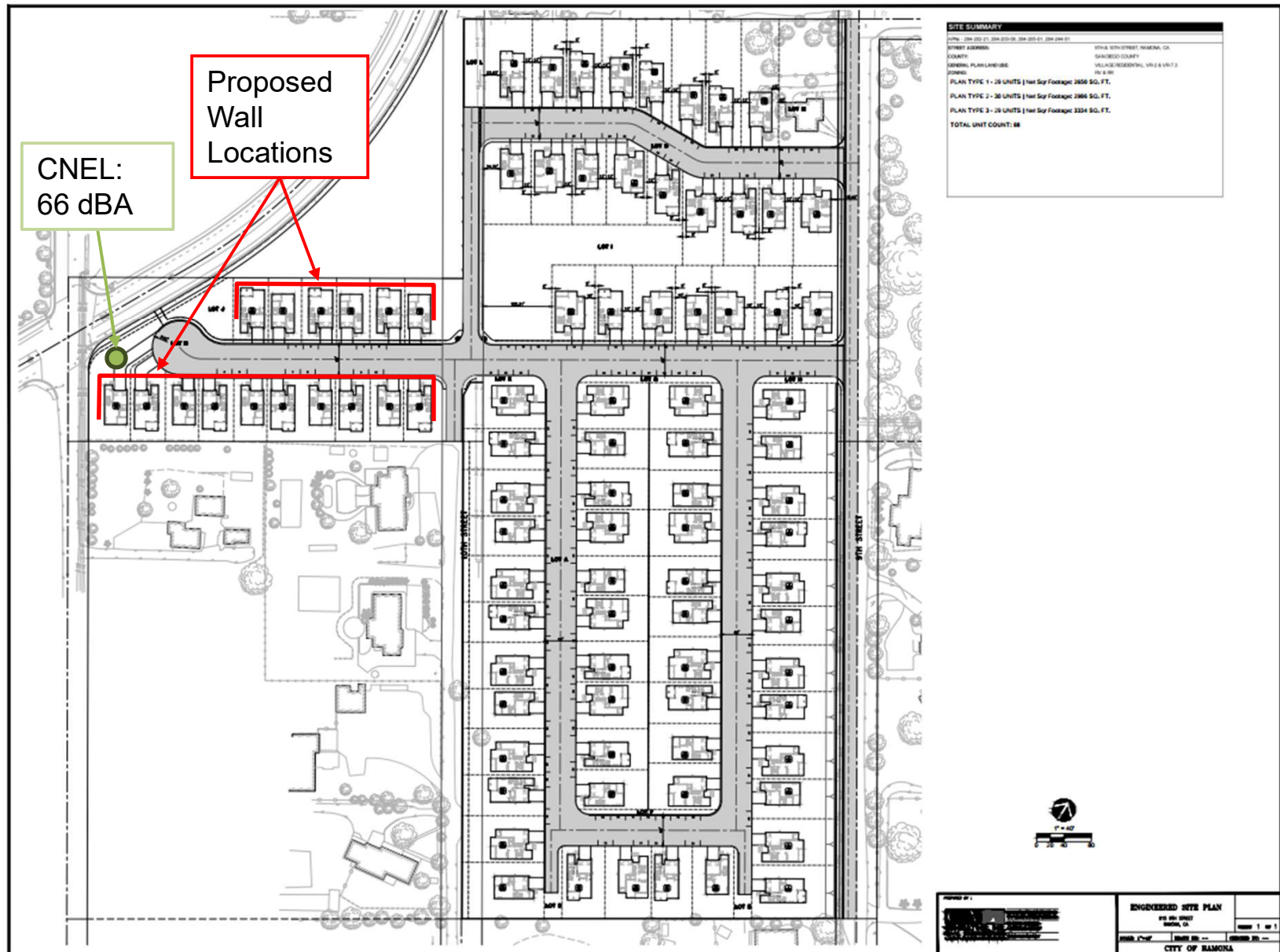
7.2.1 Future On-Site Exterior Noise Impact

The project residential unit with the loudest expected traffic noise is the residence located closest to 10th Street and 11th Street, labeled as lot 58 on the Tentative Tract Map for the project. This exterior use for this residence is located approximately 81 feet from 10th Street and 60 feet from 11th Street. The potential on-site exterior noise impacts caused by the vehicular traffic were calculated at this residential exterior use. The FHWA Traffic Noise Prediction Model (FHWA-RD-77-108) standards were used in conjunction with the cumulative plus project traffic data provided by the Traffic Impact Analysis prepared for this project by LLG Engineers. The exterior noise level at the exterior use due to nearby roadway traffic is projected to be 66 dBA CNEL. This noise level falls within the "Conditionally Acceptable" range in the Land Use Compatibility table in the County's General Plan.

The project must comply with the 60 dBA CNEL exterior noise standard for single-family residential uses presented in Table N-2 of the San Diego County General Plan (Exhibit E of this report). Thus, MD recommends a 6-foot wall be built along the property line of the sixteen (16) residential units closest to 10th Street and 11th Street, labeled as lots 49-64 on the Tentative Tract Map. The exterior noise level due to 10th and 11th Street traffic at the nearest exterior residential use is reduced to 60 dBA CNEL with the use of 6-foot walls. See Appendix B for calculations.

<Exhibit G, next page>

Exhibit G Proposed Wall Locations



7.2.2 Future On-Site Interior Noise Impact

The future interior noise level was calculated for the on-site sensitive receptor locations using a typical “windows open” and “windows closed” condition. A “windows open” condition assumes 12 dBA of noise attenuation from the exterior noise level. A “windows closed” condition assumes a minimum of 20 dBA of noise attenuation from the exterior noise level. Table 5 indicates interior noise levels for the project site.

Table 5: Future Interior Noise Levels (dBA CNEL)

Roadway Noise Source	Exterior Facade Study Location	Noise Level at Building Facade	Interior Noise Standard	Interior Noise Reduction Required to Meet Noise Standards ²	Interior Noise Level		General Plan Noise Standard Met?
					Window Open ³	Windows Closed ⁴	
10 th St and 11 th St	Lot 58	60	45	15	48	40	Yes
Notes: ¹ Noise level from traffic noise calculations, sheets in Appendix B. ² See Exhibit E for interior noise standards per San Diego County General Plan. ³ A minimum of 12 dBA noise reduction is assumed with a "windows open" condition. ⁴ A minimum of 20 dBA noise reduction is assumed with a "windows closed" condition.							

As shown in Table 5, the interior noise level will be 48 dBA CNEL with the windows open and 40 dBA CNEL with the windows closed. These levels meet the single-family interior noise standard of 45 dBA CNEL per Table N-2 of the San Diego County General Plan (Exhibit E of this report).

7.3 Project Design Features

The following outlines the project design features required to meet the acoustical requirements of the San Diego General Plan:

1. The project will incorporate a 6-foot wall along the northern and western property lines of the sixteen (16) residential plots closest to 10th Street and 11th Street.

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 6.

Table 6: 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 County's Municipal Code Section 36.408. In addition, per Section 36.409, noise due to construction activities must not exceed an average level of 75 dBA over 8 hours at any adjacent property.

Construction noise is considered a short-term impact and would be considered significant if construction occurs outside the allowable times as described in the County's Municipal Code. Construction noise will

have a temporary or periodic increase in the ambient noise level above the existing within the project vicinity.

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 7. A likely worst-case construction noise scenario assumes equipment operating as close as 30 feet and an average of 400 feet from the nearest sensitive receptor, the residences to the north of the project site.

Table 7: Construction Noise Levels at Residences to the North

Phase	dBA Lmax	dBA Leq
Demo	95.9	62.8
Site Prep	89.9	63.7
Grading	90.9	64.4
Build	89.9	62.1
Paving	88.9	58.3
Arch Coating	83.9	50.0

As shown in Table 7, construction noise is expected to reach up to 96 dBA Lmax during demolition and 64 dBA Leq during grading. The construction noise will remain below the 75 dBA Leq (8-hour) threshold outlined by the County Municipal Code. Thus, noise due to construction is less than significant.

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 roller has a vibration impact of 0.21 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 8 (below) provides general thresholds and guidelines as to the vibration damage potential from vibratory impacts.

Table 8: 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 9 gives approximate vibration levels for particular construction activities. This data provides a reasonable estimate for a wide range of soil conditions.

Table 9: 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
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 building to the project is a residential building located 30 feet north of construction operations. At a distance of 30 feet, a vibratory roller would yield a worst-case 0.172 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.

9.0 CEQA Consistency

This section addresses County of San Diego General Plan Program EIR issues, policies, and mitigation measures applicable to the subject project.

Issue 1: Excessive Noise Levels

Mitigation Measure NOI-1.1: Require an acoustical analysis whenever a new development may result in any existing or future noise sensitive land uses being subject to on-site noise levels of 60 dBA (CNEL) or greater, or other land uses that may result in noise levels exceeding the “Acceptable” standard in the Noise Compatibility Guidelines (Table N-1 in the Noise Element).

As described in Section 7.1.1, existing adjacent land uses are already subject to noise levels considered above “Acceptable” due to traffic conditions and the project would not add a substantial increase.

As described in Section 7.2.1, the addition of a 6-foot wall along the northern and western property lines of the sixteen (16) nearest residential uses to 10th Street and 11th Street will ensure that the proposed single-family residential units will not be exposed to noise levels above 60 dBA CNEL. Thus, the project land uses will not exceed the “Acceptable” standard in the Noise Compatibility Guidelines with the inclusion of the property line walls.

Issue 3: Permanent Increase in Ambient Noise Levels

Section 2.11.7.3 of the EIR states:

Implementation of the General Plan Update would permanently increase ambient noise along roadways. Therefore, the proposed [GPU] project would result in a potentially significant impact. Additionally, General Plan Update would result in a cumulatively considerable contribution to a potentially significant cumulative impact. Although implementation of the proposed General Plan Update policies and mitigation measures would reduce the [GPU] project’s direct impact and contribution to a cumulative impact to the extent feasible, impacts associated with permanent noise increases would remain significant and unavoidable.

As described in Section 7.1.1, project traffic would add less than 1 dBA CNEL to existing levels along 10th Street and 11th Street. However, project traffic would add more than 1 dBA CNEL to existing levels along 9th Street and would therefore result in cumulatively considerable impacts. However, the EIR found this impact to be unavoidable.

Issue 4: Temporary Increase in Ambient Noise Levels

Policy N-6.4: Hours of Construction.

Require development to limit the hours of operation as appropriate for non-emergency construction and maintenance, trash collection, and parking lot sweeper activity near noise sensitive land uses.

As described in Section 8.1, the project would adhere to the County construction time limits.

10.0 References

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

San Diego County General Plan

County of San Diego: Municipal Code

Caltrans Noise Technical Manual. 2013

Konan Vibration Criteria

LLG Engineers: 915 9th Street Residential Traffic Impact Analysis. 2025

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

8 -Hour Continuous Noise Measurement Datasheet - NM1, NM2

Project Name: 915 9th Street Noise

Project: #/Name: 0554-2025-004

Site Address/Location: 915 9th Street

Date: 06/20/2025

Field Tech/Engineer:

Site Observations:

65F partly cloudy skies, winds 0- 5 MPH. The primary noise source is traffic and residential noise. Meter place

Sound Meter: Piccolo-II, Soft dB **SN:** PO223120107

Settings: A-weighted, slow, 1-min, 8 -hour duration

Site Id: NM1, NM2



8 -Hour Continuous Noise Measurement Datasheet - Cont. - NM1, NM2

Project Name: 915 9th Street Noise

Calibrator: Larson Davis Cal 200

Site Address/Location: 915 9th Street

Cal Check: Pre-test: .05 **Post Test:** .01

Site Id: NM1, NM2

Figure 1: NM1

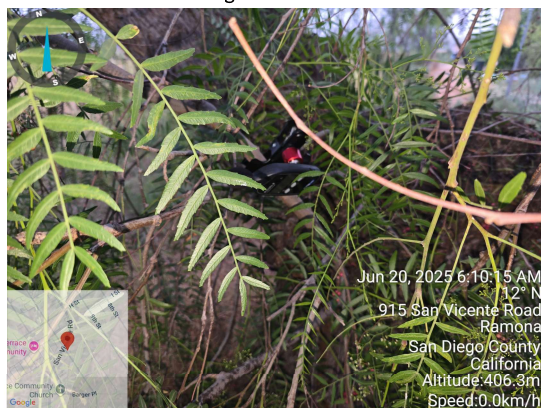


Figure 2: NM1

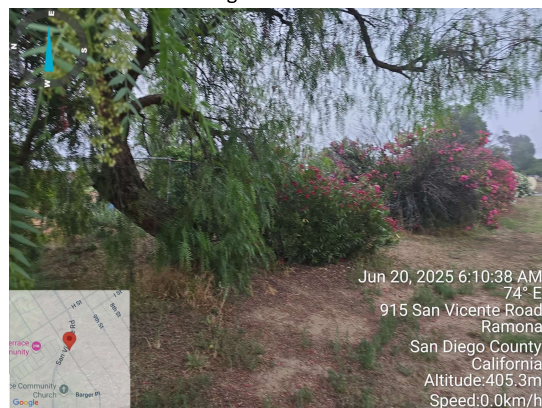


Figure 3: NM2



8 -Hour Continuous Noise Measurement Datasheet - Cont. - NM1

Project Name: 915 9th Street Noise

Site Topo:

Day: 1 of 2

Site Address/Location: 915 9th Street

Meteorological Cond.:

Noise Source(s) w/ Distance:

Site Id: NM1

Ground Type:

Table 1: Baseline Noise Measurement Summary

Date	Start	Stop	Leq	Lmax	Lmin	L2	L8	L25	L50	L90
6/20/2025	7:00 AM	8:00 AM	59.4	82.2	38.5	65.1	62.5	59.3	57.6	53.8
6/20/2025	8:00 AM	9:00 AM	58.7	75.8	36.5	64.7	61.6	58.9	57.4	54
6/20/2025	9:00 AM	10:00 AM	60.9	87.1	38	66.5	64.6	59.6	57.2	53.9
6/20/2025	10:00 AM	11:00 AM	57.8	75.5	36.6	63.2	60.5	58.6	56.5	52.9
6/20/2025	11:00 AM	12:00 PM	57.6	76.9	39.2	62.9	61.9	58	56	53.1
6/20/2025	12:00 PM	1:00 PM	58.9	80.3	37.4	66.2	62.5	59	56.8	53.1
6/20/2025	1:00 PM	2:00 PM	59.5	81.3	40.8	65.7	62.6	60	56.9	54.1
6/20/2025	2:00 PM	3:00 PM	60	86.6	41	62.3	60.1	58.5	56.8	53

	DNL	59.2	CNEL	59.2
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MD ACOUSTICS

8 -Hour Continuous Noise Measurement Datasheet - Cont. - NM2

Project Name: 915 9th Street Noise

Site Topo:

Day: 2 of 2

Site Address/Location: 915 9th Street

Meteorological Cond.:

Noise Source(s) w/ Distance:

Site Id: NM2

Ground Type:

Table 2: Baseline Noise Measurement Summary

Date	Start	Stop	Leq	Lmax	Lmin	L2	L8	L25	L50	L90
6/20/2025	7:00 AM	8:00 AM	58.3	82.1	37.2	64.9	61	57.6	48	44.9
6/20/2025	8:00 AM	9:00 AM	56.3	78.2	38.4	62.6	61.5	57.9	48.4	43.9
6/20/2025	9:00 AM	10:00 AM	55.4	76.9	36.8	62.9	59.5	56.6	48.9	42.9
6/20/2025	10:00 AM	11:00 AM	53.2	72.8	37	60.5	57.9	54.9	45.9	42.1
6/20/2025	11:00 AM	12:00 PM	55	73.8	40.7	61.9	59	56.8	52.1	45
6/20/2025	12:00 PM	1:00 PM	57.7	84.8	38.7	65.6	61.3	57.8	53.6	44.2
6/20/2025	1:00 PM	2:00 PM	55.1	75.1	42.2	60.8	59.2	56.7	51.6	47.6
6/20/2025	2:00 PM	3:00 PM	56	77.9	41.9	61.6	59.6	57.4	54.8	48.4

	DNL	56.1	CNEL	56.1
--	-----	------	------	------

MD ACOUSTICS

8 -Hour Continuous Noise Measurement Datasheet - Cont. - NM1

Project Name: 915 9th Street Noise

Site Topo:

Day: 1 of 2

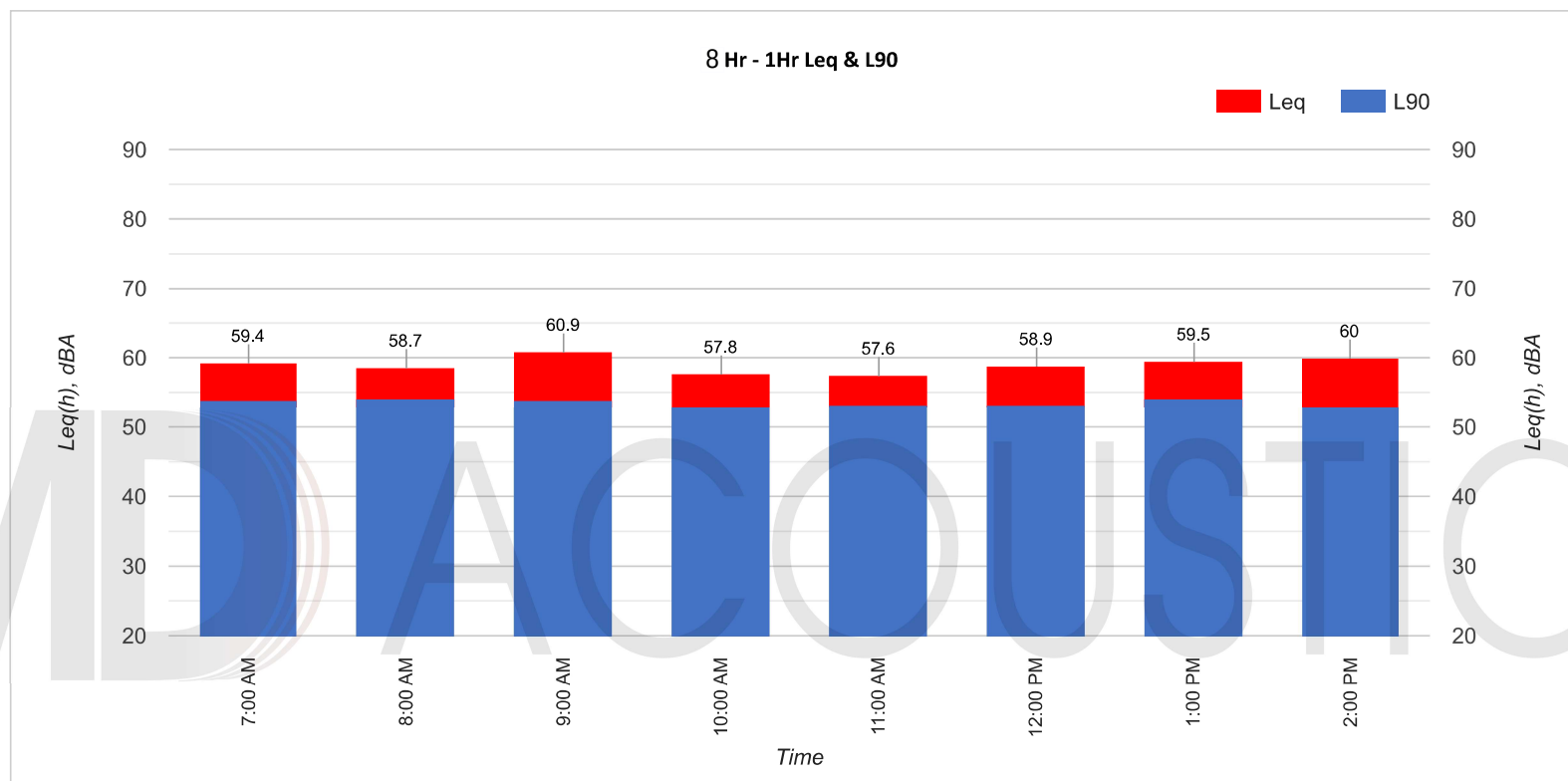
Site Address/Location: 915 9th Street

Meteorological Cond.:

Noise Source(s) w/ Distance:

Site Id: NM1

Ground Type:

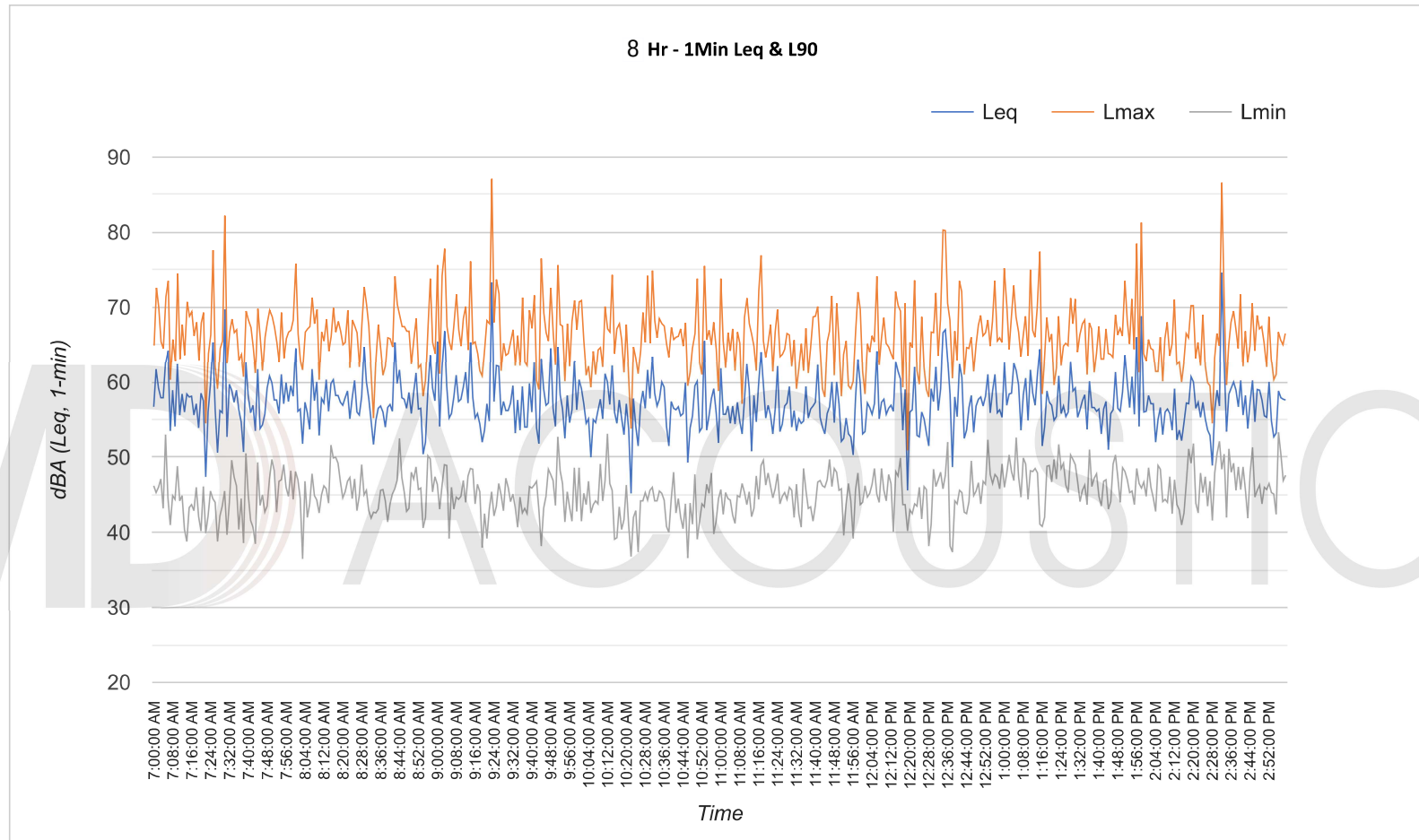


8 -Hour Continuous Noise Measurement Datasheet - Cont. - NM1

Project Name: 915 9th Street Noise
Site Address/Location: 915 9th Street
Site Id: NM1

Site Topo:
Meteorological Cond.:
Ground Type:

Day: 1 of 2
Noise Source(s) w/ Distance:

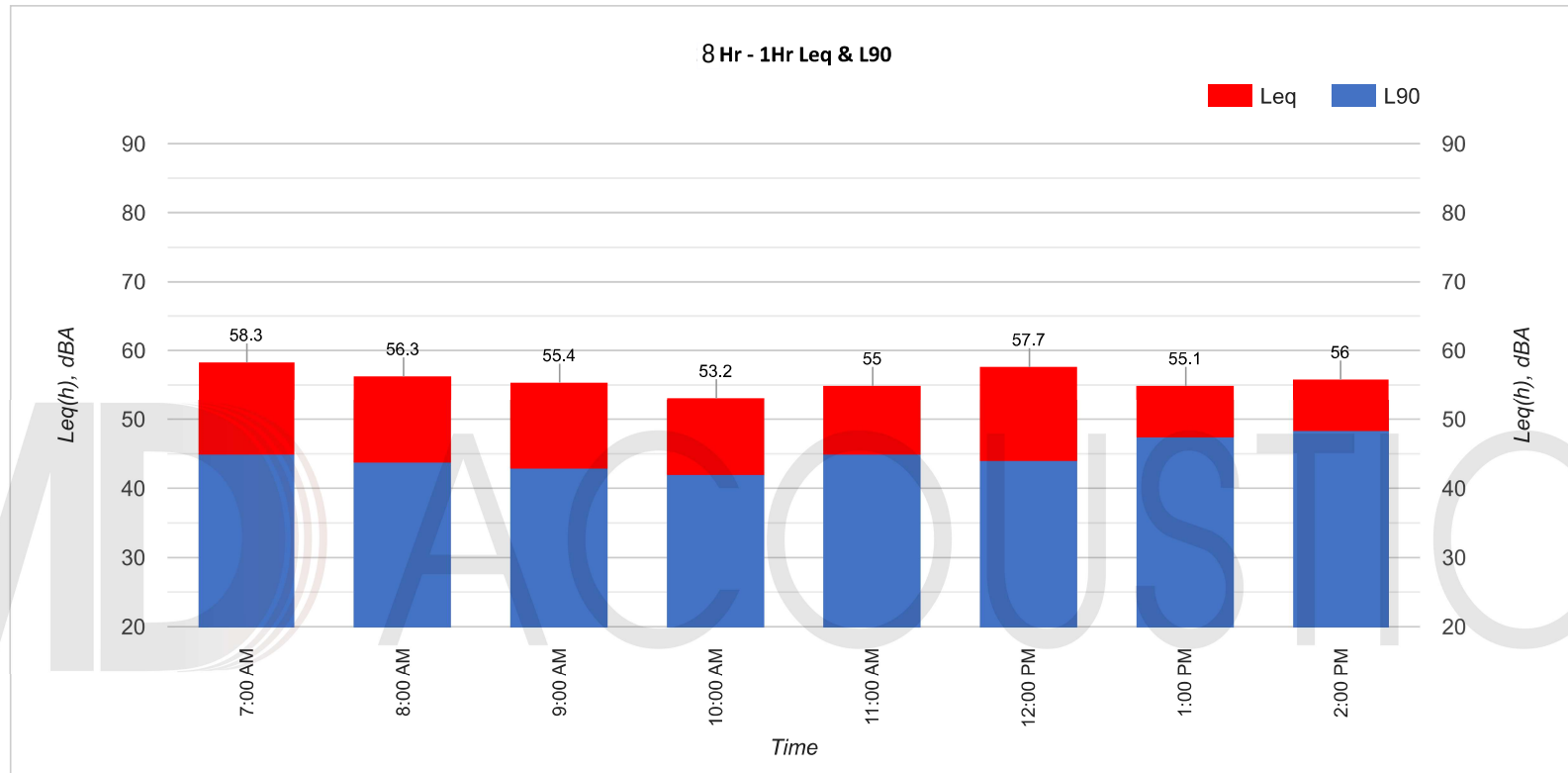


8 -Hour Continuous Noise Measurement Datasheet - Cont. - NM2

Project Name: 915 9th Street Noise
 Site Address/Location: 915 9th Street
 Site Id: NM2

Site Topo:
 Meteorological Cond.:
 Ground Type:

Day: 1 of 2
 Noise Source(s) w/ Distance:

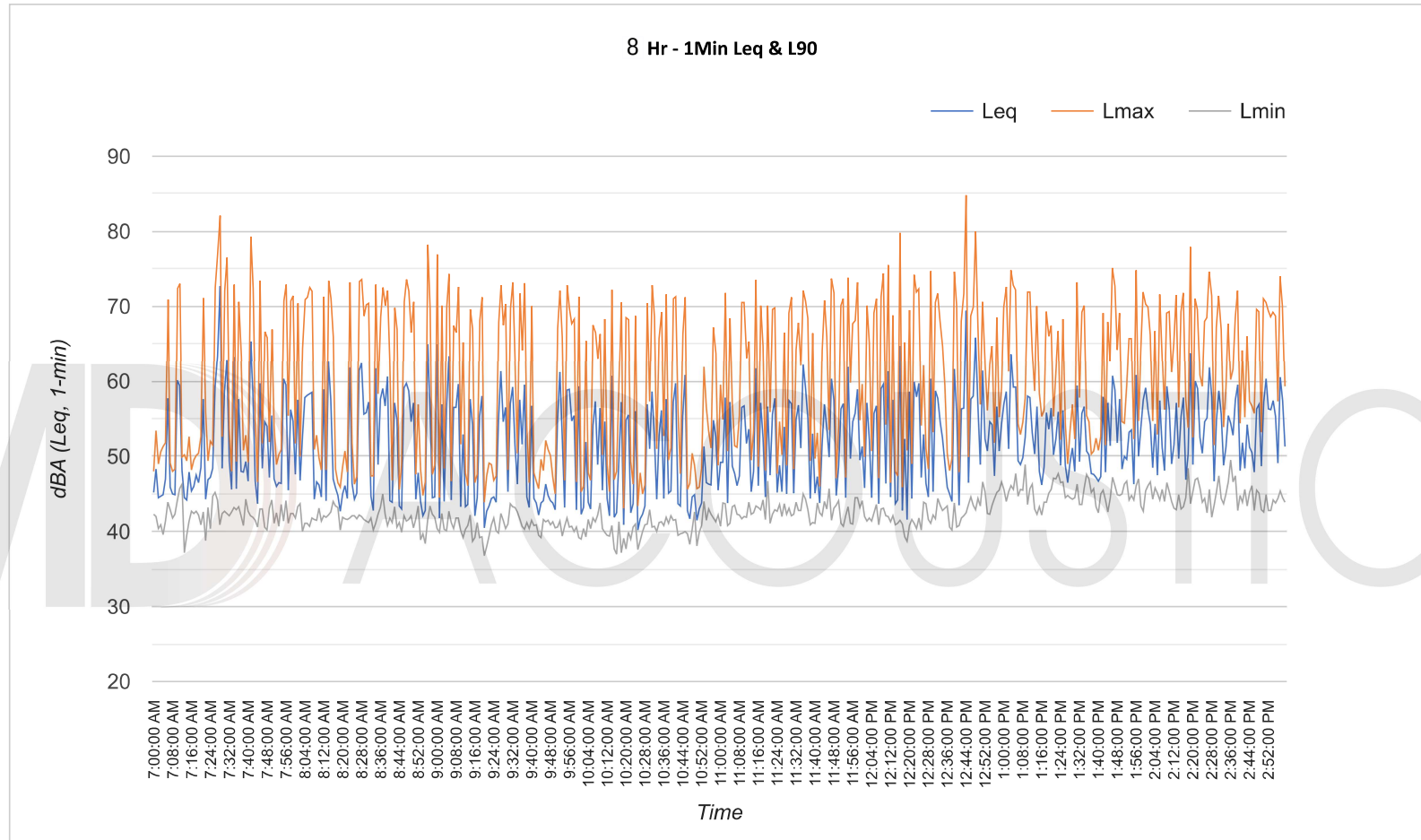


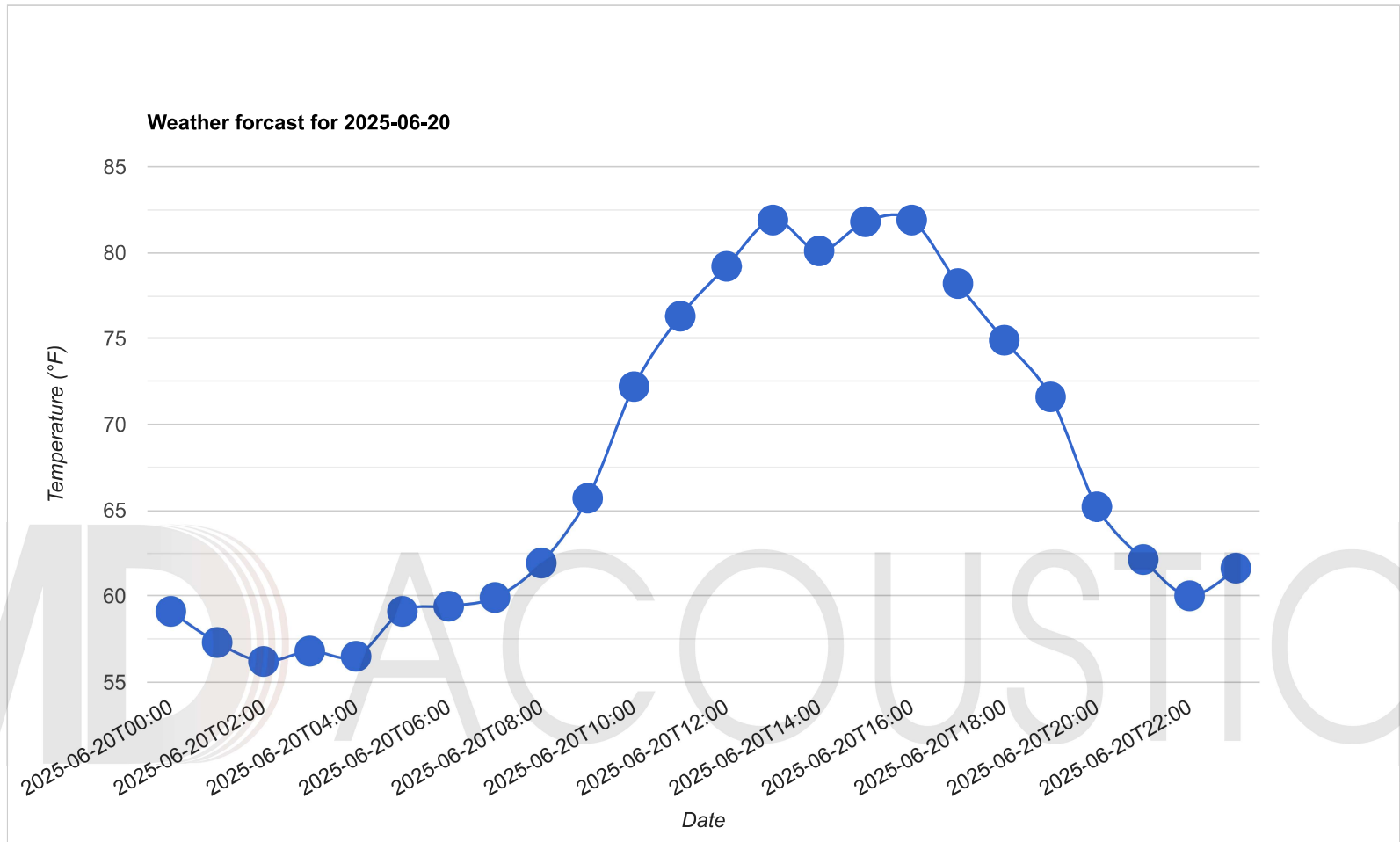
8 -Hour Continuous Noise Measurement Datasheet - Cont. - NM2

Project Name: 915 9th Street Noise
 Site Address/Location: 915 9th Street
 Site Id: NM2

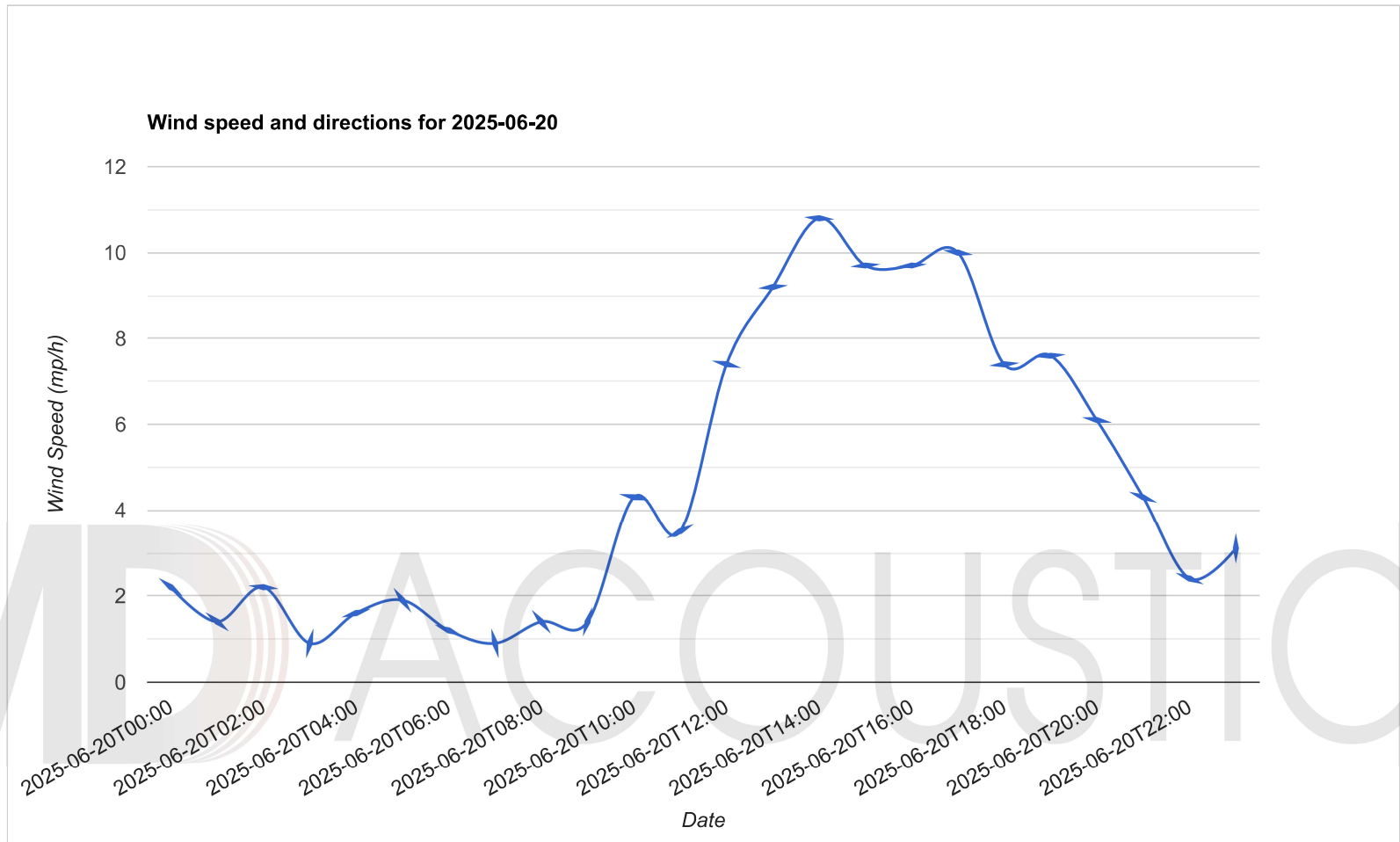
Site Topo:
 Meteorological Cond.:
 Ground Type:

Day: 1 of 2
 Noise Source(s) w/ Distance:





Source: Global Forecast System (GFS) weather forecast model



Source: Global Forecast System (GFS) weather forecast model

CNEL CALCULATED FROM SITE MEASUREMENTS

PROJECT: 915 9th St Residential
LOCATION: NM1

DATE: 31-Oct-25
JN: 0554-2025-04

TIME BEGINNING	HOURLY LEQ	HOURLY LEQ WEIGHTING	ADJUSTED HOURLY LEQ
0000	54.3	10.0	64.3
0100	51.9	10.0	61.9
0200	50.6	10.0	60.6
0300	48.9	10.0	58.9
0400	49.8	10.0	59.8
0500	53.6	10.0	63.6
0600	60.1	10.0	70.1
0700	59.4	0.0	59.4
0800	58.7	0.0	58.7
0900	60.9	0.0	60.9
1000	57.8	0.0	57.8
1100	57.6	0.0	57.6
1200	58.9	0.0	58.9
1300	59.5	0.0	59.5
1400	60.0 *	0.0	60.0
1500	61.2	0.0	61.2
1600	62.7	0.0	62.7
1700	62.3	0.0	62.3
1800	60.6	0.0	60.6
1900	59.3	5.0	64.3
2000	58.2	5.0	63.2
2100	57.5	5.0	62.5
2200	56.5	10.0	66.5
2300	55.9	10.0	65.9
CNEL (dBA)			62.9

HR. MEASURED: 1400 *
MEASURED LEQ: 60.0 *

CNEL CALCULATED FROM SITE MEASUREMENTS

PROJECT: 915 9th St Residential
LOCATION: NM2

DATE: 31-Oct-25
JN: 0554-2025-04

TIME BEGINNING	HOURLY LEQ	HOURLY LEQ WEIGHTING	ADJUSTED HOURLY LEQ
0000	50.3	10.0	60.3
0100	47.9	10.0	57.9
0200	46.6	10.0	56.6
0300	44.9	10.0	54.9
0400	45.8	10.0	55.8
0500	49.6	10.0	59.6
0600	56.1	10.0	66.1
0700	58.3	0.0	58.3
0800	56.3	0.0	56.3
0900	55.4	0.0	55.4
1000	53.2	0.0	53.2
1100	55.0	0.0	55.0
1200	57.7	0.0	57.7
1300	55.1	0.0	55.1
1400	56.0 *	0.0	56.0
1500	57.2	0.0	57.2
1600	58.7	0.0	58.7
1700	58.3	0.0	58.3
1800	56.6	0.0	56.6
1900	55.3	5.0	60.3
2000	54.2	5.0	59.2
2100	53.5	5.0	58.5
2200	52.5	10.0	62.5
2300	51.9	10.0	61.9
CNEL (dBA)			59.1

HR. MEASURED: 1400 *
MEASURED LEQ: 56.0 *

Appendix B:
Traffic Noise Modeling Output

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

PROJECT: 915 9TH ST RESIDENTIAL PROJECT
 ROADWAY: 9TH ST
 LOCATION: 45 FT FROM CENTERLINE

JOB #: 0554-25-04
 DATE: #####
 ENGINEER: N. Jensen

NOISE INPUT DATA - EXISTING

ROADWAY CONDITIONS

ADT = 1,000
 SPEED = 25
 PK HR % = 10
 NEAR LANE/FAR LANE DI: 15
 ROAD ELEVATION = 0.0
 GRADE = 1.0 %
 PK HR VOL = 100

RECEIVER INPUT DATA

RECEIVER DISTANCE = 45
 DIST C/L TO WALL = 0
 RECEIVER HEIGHT = 5.0
 WALL DISTANCE FROM RECEIVER 45
 PAD ELEVATION = 0.5
 ROADWAY VIEW: LF ANGLE= -90
 RT ANGLE= 90
 DF ANGLE= 180

SITE CONDITIONS

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

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	44.51	--
MEDIUM TRUCKS	4.0	44.40	--
HEAVY TRUCKS	8.0	44.44	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	50.5	48.6	46.8	40.8	49.4	50.0
MEDIUM TRUCKS	44.9	43.4	37.0	35.5	43.9	44.2
HEAVY TRUCKS	47.1	45.7	36.6	37.9	46.2	46.4
NOISE LEVELS (dBA)	52.9	51.2	47.6	43.3	51.9	52.3

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	50.5	48.6	46.8	40.8	49.4	50.0
MEDIUM TRUCKS	44.9	43.4	37.0	35.5	43.9	44.2
HEAVY TRUCKS	47.1	45.7	36.6	37.9	46.2	46.4
NOISE LEVELS (dBA)	52.9	51.2	47.6	43.3	51.9	52.3

NOISE CONTOUR (FT)

NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	1	2	8	24
LDN	1	2	7	22

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

PROJECT: 915 9TH ST RESIDENTIAL PROJECT
 ROADWAY: 9TH ST
 LOCATION: 45 FT FROM CENTERLINE

JOB #: 0554-25-04
 DATE: #####
 ENGINEER: N. Jensen

NOISE INPUT DATA - EXISTING + PROJECT

ROADWAY CONDITIONS

ADT = 1,480
 SPEED = 25
 PK HR % = 10
 NEAR LANE/FAR LANE DI: 15
 ROAD ELEVATION = 0.0
 GRADE = 1.0 %
 PK HR VOL = 148

RECEIVER INPUT DATA

RECEIVER DISTANCE = 45
 DIST C/L TO WALL = 0
 RECEIVER HEIGHT = 5.0
 WALL DISTANCE FROM RECEIVER 45
 PAD ELEVATION = 0.5
 ROADWAY VIEW: LF ANGLE= -90
 RT ANGLE= 90
 DF ANGLE= 180

SITE CONDITIONS

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

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	44.51	--
MEDIUM TRUCKS	4.0	44.40	--
HEAVY TRUCKS	8.0	44.44	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	52.2	50.3	48.5	42.5	51.1	51.7
MEDIUM TRUCKS	46.6	45.1	38.7	37.2	45.6	45.9
HEAVY TRUCKS	48.8	47.4	38.3	39.6	47.9	48.1
NOISE LEVELS (dBA)	54.6	52.9	49.3	45.0	53.6	54.0

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	52.2	50.3	48.5	42.5	51.1	51.7
MEDIUM TRUCKS	46.6	45.1	38.7	37.2	45.6	45.9
HEAVY TRUCKS	48.8	47.4	38.3	39.6	47.9	48.1
NOISE LEVELS (dBA)	54.6	52.9	49.3	45.0	53.6	54.0

NOISE CONTOUR (FT)

NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	1	4	11	36
LDN	1	3	10	32

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

PROJECT: 915 9TH ST RESIDENTIAL PROJECT
 ROADWAY: 10TH ST
 LOCATION: 60 FT FROM CENTERLINE

JOB #: 0554-25-04
 DATE: #####
 ENGINEER: N. Jensen

NOISE INPUT DATA - EXISTING

ROADWAY CONDITIONS

ADT = 7,650
 SPEED = 40
 PK HR % = 10
 NEAR LANE/FAR LANE DI: 30
 ROAD ELEVATION = 0.0
 GRADE = 1.0 %
 PK HR VOL = 765

RECEIVER INPUT DATA

RECEIVER DISTANCE = 60
 DIST C/L TO WALL = 0
 RECEIVER HEIGHT = 5.0
 WALL DISTANCE FROM RECEIVER 60
 PAD ELEVATION = 0.5
 ROADWAY VIEW: LF ANGLE= -90
 RT ANGLE= 90
 DF ANGLE= 180

SITE CONDITIONS

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

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	58.20	--
MEDIUM TRUCKS	4.0	58.11	--
HEAVY TRUCKS	8.0	58.15	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	64.0	62.1	60.4	54.3	62.9	63.5
MEDIUM TRUCKS	55.7	54.2	47.9	46.3	54.8	55.0
HEAVY TRUCKS	56.6	55.2	46.2	47.4	55.8	55.9
NOISE LEVELS (dBA)	65.3	63.5	60.8	55.7	64.2	64.7

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	64.0	62.1	60.4	54.3	62.9	63.5
MEDIUM TRUCKS	55.7	54.2	47.9	46.3	54.8	55.0
HEAVY TRUCKS	56.6	55.2	46.2	47.4	55.8	55.9
NOISE LEVELS (dBA)	65.3	63.5	60.8	55.7	64.2	64.7

NOISE CONTOUR (FT)

NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	18	56	178	563
LDN	16	50	159	502

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

PROJECT: 915 9TH ST RESIDENTIAL PROJECT
ROADWAY: 10TH ST
LOCATION: 60 FT FROM CENTERLINE

JOB #: 0554-25-04
DATE: #####
ENGINEER: N. Jensen

NOISE INPUT DATA - EXISTING + PROJECT

ROADWAY CONDITIONS

ADT = 7,820
SPEED = 40
PK HR % = 10
NEAR LANE/FAR LANE DI: 30
ROAD ELEVATION = 0.0
GRADE = 1.0 %
PK HR VOL = 782

RECEIVER INPUT DATA

RECEIVER DISTANCE = 60
DIST C/L TO WALL = 0
RECEIVER HEIGHT = 5.0
WALL DISTANCE FROM RECEIVER 60
PAD ELEVATION = 0.5
ROADWAY VIEW: LF ANGLE= -90
RT ANGLE= 90
DF ANGLE= 180

SITE CONDITIONS

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

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	58.20	--
MEDIUM TRUCKS	4.0	58.11	--
HEAVY TRUCKS	8.0	58.15	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	64.1	62.2	60.5	54.4	63.0	63.6
MEDIUM TRUCKS	55.8	54.3	48.0	46.4	54.9	55.1
HEAVY TRUCKS	56.7	55.3	46.3	47.5	55.9	56.0
NOISE LEVELS (dBA)	65.4	63.6	60.9	55.8	64.3	64.8

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	64.1	62.2	60.5	54.4	63.0	63.6
MEDIUM TRUCKS	55.8	54.3	48.0	46.4	54.9	55.1
HEAVY TRUCKS	56.7	55.3	46.3	47.5	55.9	56.0
NOISE LEVELS (dBA)	65.4	63.6	60.9	55.8	64.3	64.8

NOISE CONTOUR (FT)

NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	18	58	182	575
LDN	16	51	162	513

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

PROJECT: 915 9TH ST RESIDENTIAL PROJECT
 ROADWAY: 11TH ST
 LOCATION: 50 FT FROM CENTERLINE

JOB #: 0554-25-04
 DATE: #####
 ENGINEER: N. Jensen

NOISE INPUT DATA - EXISTING

ROADWAY CONDITIONS

ADT = 7,030
 SPEED = 30
 PK HR % = 10
 NEAR LANE/FAR LANE DI: 20
 ROAD ELEVATION = 0.0
 GRADE = 1.0 %
 PK HR VOL = 703

RECEIVER INPUT DATA

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

SITE CONDITIONS

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

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	49.11	--
MEDIUM TRUCKS	4.0	49.01	--
HEAVY TRUCKS	8.0	49.05	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	60.8	58.9	57.1	51.1	59.7	60.3
MEDIUM TRUCKS	54.2	52.7	46.3	44.8	53.2	53.5
HEAVY TRUCKS	55.9	54.4	45.4	46.7	55.0	55.1
NOISE LEVELS (dBA)	62.7	60.9	57.7	53.1	61.6	62.1

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	60.8	58.9	57.1	51.1	59.7	60.3
MEDIUM TRUCKS	54.2	52.7	46.3	44.8	53.2	53.5
HEAVY TRUCKS	55.9	54.4	45.4	46.7	55.0	55.1
NOISE LEVELS (dBA)	62.7	60.9	57.7	53.1	61.6	62.1

NOISE CONTOUR (FT)

NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	8	26	81	256
LDN	7	23	73	231

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

PROJECT: 915 9TH ST RESIDENTIAL PROJECT
 ROADWAY: 11TH ST
 LOCATION: 50 FT FROM CENTERLINE

JOB #: 0554-25-04
 DATE: #####
 ENGINEER: N. Jensen

NOISE INPUT DATA - EXISTING + PROJECT

ROADWAY CONDITIONS

ADT = 7,070
 SPEED = 30
 PK HR % = 10
 NEAR LANE/FAR LANE DI: 20
 ROAD ELEVATION = 0.0
 GRADE = 1.0 %
 PK HR VOL = 707

RECEIVER INPUT DATA

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

SITE CONDITIONS

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

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	49.11	--
MEDIUM TRUCKS	4.0	49.01	--
HEAVY TRUCKS	8.0	49.05	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	60.8	58.9	57.2	51.1	59.7	60.3
MEDIUM TRUCKS	54.2	52.7	46.3	44.8	53.2	53.5
HEAVY TRUCKS	55.9	54.5	45.4	46.7	55.0	55.2
NOISE LEVELS (dBA)	62.7	61.0	57.8	53.1	61.7	62.1

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	60.8	58.9	57.2	51.1	59.7	60.3
MEDIUM TRUCKS	54.2	52.7	46.3	44.8	53.2	53.5
HEAVY TRUCKS	55.9	54.5	45.4	46.7	55.0	55.2
NOISE LEVELS (dBA)	62.7	61.0	57.8	53.1	61.7	62.1

NOISE CONTOUR (FT)

NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	8	26	82	258
LDN	7	23	73	232

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

PROJECT: 915 9TH ST RESIDENTIAL PROJECT
 ROADWAY: 10TH ST
 LOCATION: 60 FT FROM CENTERLINE

JOB #: 0554-25-04
 DATE: #####
 ENGINEER: N. Jensen

NOISE INPUT DATA - CUMULATIVE + PROJECT

ROADWAY CONDITIONS

ADT = 8,280
 SPEED = 40
 PK HR % = 10
 NEAR LANE/FAR LANE DI: 30
 ROAD ELEVATION = 0.0
 GRADE = 1.0 %
 PK HR VOL = 828

RECEIVER INPUT DATA

RECEIVER DISTANCE = 81
 DIST C/L TO WALL = 73
 RECEIVER HEIGHT = 5.0
 WALL DISTANCE FROM RECEIVER 8
 PAD ELEVATION = 0.5
 ROADWAY VIEW: LF ANGLE= -90
 RT ANGLE= 90
 DF ANGLE= 180

SITE CONDITIONS

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

WALL INFORMATION

HTH WALL 6.0
 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	79.65	--
MEDIUM TRUCKS	4.0	79.55	--
HEAVY TRUCKS	8.0	79.52	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	63.0	61.1	59.3	53.3	61.9	62.5
MEDIUM TRUCKS	54.7	53.2	46.9	45.3	53.8	54.0
HEAVY TRUCKS	55.6	54.2	45.2	46.4	54.8	54.9
NOISE LEVELS (dBA)	64.3	62.5	59.7	54.6	63.2	63.7

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	56.8	55.0	53.2	47.1	55.8	56.4
MEDIUM TRUCKS	48.9	47.4	41.1	39.5	48.0	48.2
HEAVY TRUCKS	50.3	48.9	39.9	41.1	49.5	49.6
NOISE LEVELS (dBA)	58.3	56.5	53.7	48.6	57.2	57.7

NOISE CONTOUR (FT)

NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	19	60	190	601
LDN	17	54	169	536

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

PROJECT: 915 9TH ST RESIDENTIAL PROJECT
 ROADWAY: 11TH ST
 LOCATION: 50 FT FROM CENTERLINE

JOB #: 0554-25-04
 DATE: #####
 ENGINEER: N. Jensen

NOISE INPUT DATA - CUMULATIVE + PROJECT,

ROADWAY CONDITIONS

ADT = 7,480
 SPEED = 30
 PK HR % = 10
 NEAR LANE/FAR LANE DI: 20
 ROAD ELEVATION = 0.0
 GRADE = 1.0 %
 PK HR VOL = 748

RECEIVER INPUT DATA

RECEIVER DISTANCE = 60
 DIST C/L TO WALL = 48
 RECEIVER HEIGHT = 5.0
 WALL DISTANCE FROM RECEIVER 12
 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 6.0
 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	59.20	--
MEDIUM TRUCKS	4.0	59.05	--
HEAVY TRUCKS	8.0	59.01	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	60.3	58.4	56.6	50.5	59.2	59.8
MEDIUM TRUCKS	53.6	52.1	45.8	44.2	52.7	52.9
HEAVY TRUCKS	55.3	53.9	44.9	46.1	54.5	54.6
NOISE LEVELS (dBA)	62.1	60.4	57.2	52.6	61.1	61.6

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	53.9	52.0	50.3	44.2	52.8	53.4
MEDIUM TRUCKS	47.8	46.3	40.0	38.4	46.9	47.1
HEAVY TRUCKS	50.2	48.8	39.8	41.0	49.4	49.5
NOISE LEVELS (dBA)	56.2	54.4	51.2	46.6	55.1	55.6

NOISE CONTOUR (FT)

NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	9	27	86	272
LDN	8	24	77	245

Appendix C:
HVAC Reference Sheets

50PG03-14

Ultra High Efficiency Single Package Electric Cooling with
Optional Electric Heat Commercial Rooftop Units with Puron®
(R-410A) Refrigerant, Optional EnergyX™ (Energy Recovery
Ventilator)
2 to 12.5 Nominal Tons

Carrier

turn to the experts



Not equipment being
used, but a similar
assumption

Product Data



AHRI* CAPACITY RATINGS

50PG03-14

UNIT 50PG	NOMINAL CAPACITY (Tons)	NET COOLING CAPACITY (Btuh)	TOTAL POWER (kW)	SEER	EER†	SOUND RATING (dB)	IEER
03	2.0	24,000	2.1	14.1	11.5	75	—
04	3.0	35,800	3.1	14.1	11.7	73	—
05	4.0	47,500	4.0	15.0	12.2	72	—
06	5.0	58,500	4.9	14.8	12.2	78	—
07	6.0	69,000	5.8	—	12.2	78	13.0
08	7.5	88,000	7.0	—	12.7	80	13.5
09	8.5	102,000	8.4	—	12.4	80	13.4
12	10.0	119,000	9.9	—	12.2	80	13.0
14	12.5	150,000	13.2	—	11.5	83	11.6

LEGEND

EER – Energy Efficiency Ratio

SEER – Seasonal Energy Efficiency Ratio

*Air Conditioning, Heating and Refrigeration Institute.

† AHRI does not require EER ratings for units with capacity below 65,000 Btuh.

NOTES:

1. Tested in accordance with AHRI Standards 210–94 (sizes 03–12), 360–93 (size 14).

2. Ratings are net values, reflecting the effects of circulating fan heat.

3. Ratings are based on:

Cooling Standard: 80°F db, 67°F wb indoor entering–air temperature and 95°F db air entering outdoor unit.

IPLV Standard: 80°F db, 67°F wb indoor entering–air temperature and 80°F db outdoor entering–air temperature.

4. All 50PG units are in compliance with Energy Star® and ASHRAE 90.1 2010 Energy Standard for minimum SEER and EER requirements.

5. Units are rated in accordance with AHRI sound standards 270 or 370.

6. Per AHRI, Integrated Energy Efficiency Ratio (IEER) became effective beginning January 1, 2010. Integrated Part–Load Value (IPLV) was superseded by IEER on January 1, 2010. IEER is intended to be a measure of merit for the part load performance of the unit. Each building may have different part load performance due to local occupancy schedules, building construction, building location and ventilation requirements. For specific building energy analysis, an hour–by–hour analysis program should be used.

*Assuming 1 3-ton unit
per condo unit or single
-family home*



Use of the AHRI Certified
TM Mark indicates a
manufacturer's
participation in the
program For verification
of certification for individual
products, go to
www.ahridirectory.org.

Appendix D:
Construction Noise Modeling Output

Receptor - Residences 50 ft to the west

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	Recptor. Item Leq, dBA
DEMO									
Excavator	3	81	30	400	40	0.66	0.40	86.9	53.0
Dozer	2	82	30	400	40	0.66	0.40	87.9	54.0
Concrete Saw	1	90	30	400	20	0.66	0.20	95.9	59.0
Tractor	0	84	30	400	40	0.66	0.40	0.0	0.0
							Log Sum	95.9	62.8
SITE PREP									
Grader	0	85	30	400	40	0.66	0.40	0.0	0.0
Tractor	4	84	30	400	40	0.66	0.40	89.9	56.0
Dozer	3	82	30	400	40	0.66	0.40	87.9	54.0
Scraper	0	84	30	400	40	0.66	0.40	0.0	0.0
							Log Sum	89.9	63.7
GRADE									
Dozer	1	82	30	400	40	0.66	0.40	87.9	54.0
Tractor	2	84	30	400	40	0.66	0.40	89.9	56.0
Grader	1	85	30	400	40	0.66	0.40	90.9	57.0
Excavator	2	81	30	400	40	0.66	0.40	86.9	53.0
Scraper	2	84	30	400	40	0.66	0.40	89.9	56.0
								90.9	64.4
BUILD									
Crane	1	81	30	400	16	0.66	0.16	86.9	49.0
Man lift	3	75	30	400	20	0.66	0.20	80.9	44.0
Tractor	3	84	30	400	40	0.66	0.40	89.9	56.0
Welder/Torch	1	74	30	400	40	0.66	0.40	79.9	46.0
Generator	1	81	30	400	50	0.66	0.50	86.9	54.0
								89.9	62.1
PAVE									
Paver	2	77	30	400	50	0.66	0.50	82.9	50.0
Concrete Mixer Truck	0	79	30	400	40	0.66	0.40	0.0	0.0
Roller	2	80	30	400	20	0.66	0.20	85.9	49.0

Tractor	0	84	30	400	40	0.66	0.40	0.0	0.0
Compactor (ground)	2	83	30	400	20	0.66	0.20	88.9	52.0
								88.9	58.3
ARCH COAT									
Compressor (air)	1	78	30	400	40	0.66	0.40	83.9	50.0
								83.9	50.0

¹FHWA Construction Noise Handbook: Table 9.1 RCNM Default Noise Emission Reference Levels and Usage Factors

VIBRATION LEVEL IMPACT

Project: 915 9th St Residential

Date: 8/20/25

Source: Vibratory Roller

Scenario: Unmitigated

Location: North residences

Address: Ramona, San Diego County

 $PPV = PPV_{ref}(25/D)^n$ (in/sec)**DATA INPUT**Equipment =
Type

1

Vibratory Roller

INPUT SECTION IN BLUE

PPVref =

0.21

Reference PPV (in/sec) at 25 ft.

D =

30.00

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 =

0.172

IN/SEC

OUTPUT IN RED