Meyers Industrial Facility

Noise Impact Study

City of Escondido, CA

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1.0 Executive Summary

This report has been prepared to provide the calculated noise projections from the proposed Project located at 2351 Meyers Avenue in Escondido, California. All calculations are compared to the City of Escondido noise ordinance and the City of San Marcos Noise Ordinance as well as the existing ambient condition. The project proposes to construct a 62,700 square foot industrial building with three (3) loading docks. Land uses surrounding the site include mainly light industrial and commercial uses as well as some residential uses. A self-storage facility borders the project site to the north, Meyers Avenue borders the project site to the east with industrial uses further east, an industrial park borders the site to the south, and a mobile home park are located to the west which is in the City of San Marcos.

1.1 Findings and Conclusions

One (1) long-term baseline ambient measurement was performed at the project site to determine the ambient noise condition within the project vicinity. Noise data indicates that the quietest daytime ambient noise level measured 47 dBA at the project site.

This study compares the Project's operational plus ambient noise levels to the ambient conditions The ambient levels are between 39 to 48 dBA Leq at the adjacent uses.

Project plus ambient operational noise levels are anticipated to measure 48 dBA Leq at adjacent uses. The operational noise increases the ambient noise level 1 point and would be considered a less than significant increase.

2.0 Introduction

2.1 Purpose of Analysis and Study Objectives

This purpose of this noise impact study is to evaluate the potential noise impacts for the project study area and compare results to City and CEQA thresholds. The assessment was conducted and compared to the noise standards set forth by the Federal, State and Local agencies. Consistent with the California Environmental Quality Act (CEQA) and CEQA Guidelines, a significant impact related to noise would occur if a proposed project is determined to result in:

- Exposure of persons to or generation of noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable agencies.
- Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels.
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

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 evaluation of the existing ambient noise environment
- An analysis of stationary noise impacts from the project site to adjacent land uses
- Construction noise and vibration evaluation

2.2 Site Location and Study Area

The project site is located at 2351 Meyers Avenue in Escondido, California, as shown in Exhibit A. The site's current land use classification is industrial. Land uses surrounding the site include Industrial to the north, east (across Meyers Avenue), south, and residential to the west.

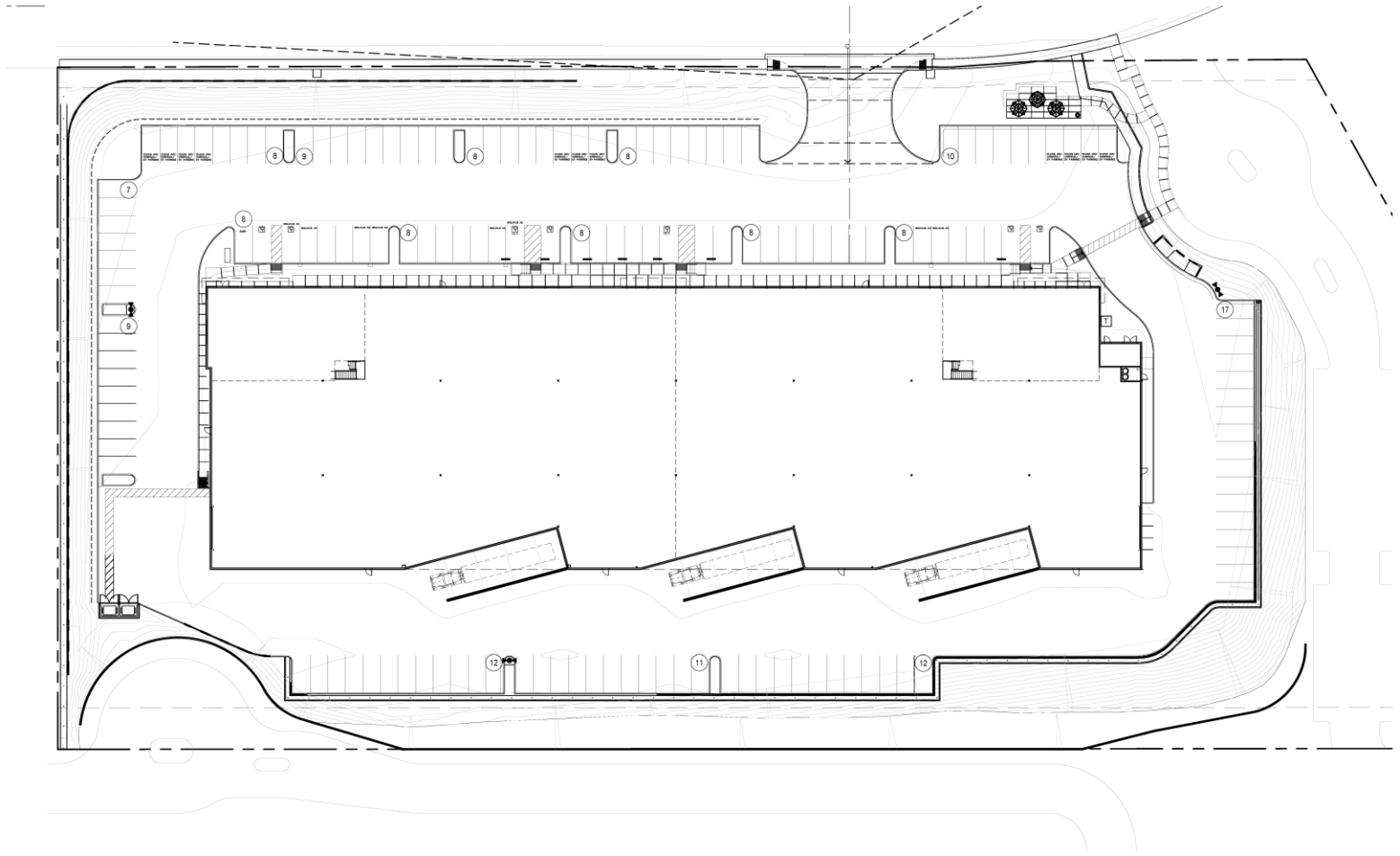
2.3 Proposed Project Description

The project site has a current land use classification of Light Industrial (LI) according to the City of Escondido General Plan Land Use Map and the proposed use is industrial. Land uses surrounding the site include mainly light industrial and commercial uses as well as some residential uses. A self-storage facility borders the project site to the north, Meyers Avenue borders the project site to the east with industrial uses further east, an industrial park borders the site to the south, and vacant land and a mobile home park are located to the west. The closest existing sensitive receptors (to the site area) are the mobile home park located approximately 50 feet to the west and the single-family residential uses located approximately 0.18 miles southwest and 0.19 miles southeast.

Exhibit A
Location Map

Exhibit B

Site Plan



3.0 Fundamentals of Noise

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

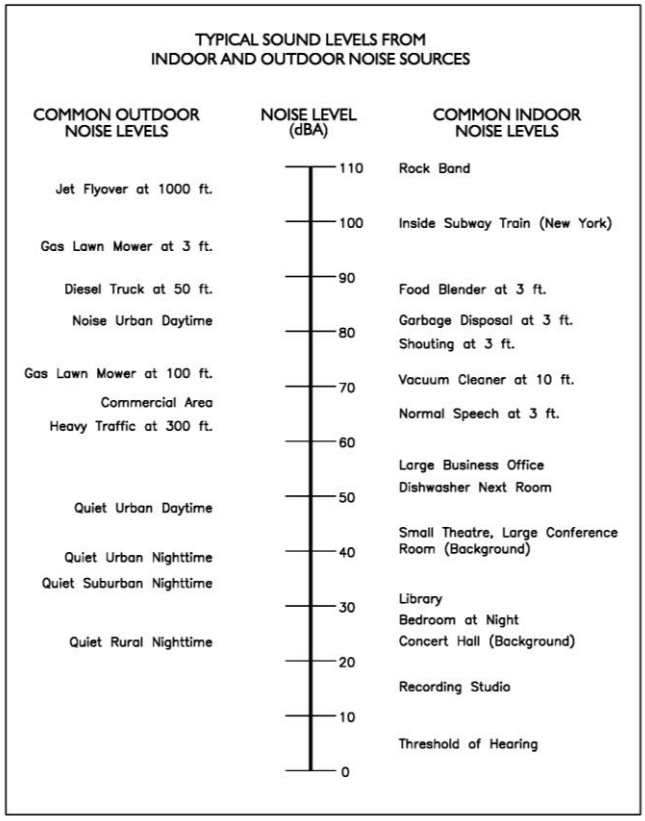
3.1 Sound, Noise and Acoustics

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.

3.2 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.

Exhibit C: Typical A-Weighted Noise Levels



3.3 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 ($\mu N/m^2$), also called micro-Pascal (µPa). One µPa is approximately one hundred billionths (0.00000000001) 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 references sound levels for different noise sources.

3.4 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 or 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.

3.5 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, 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), a scale designed to account for the frequency-dependent sensitivity of the ear. 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.

3.6 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: *A*ny 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.

3.7 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.

3.8 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 have far sound can travel.

4.0 Ground-Borne Vibration Fundamentals

4.1 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.

4.3 Vibration Propagation

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 wavefront, 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 wavefront. 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 wavefront. 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.

5.0 Regulatory Setting

The proposed project is located in the City of Escondido, 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.

5.1 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 for regulating noise from aircraft and airports. The Federal Highway Administration (FHWA) is responsible for regulating 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 Housing and Urban Development (HUD) is responsible for establishing noise regulations as it relates to exterior/interior noise levels for new HUD-assisted housing developments near high noise areas.

The federal government advocates that local jurisdictions 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.

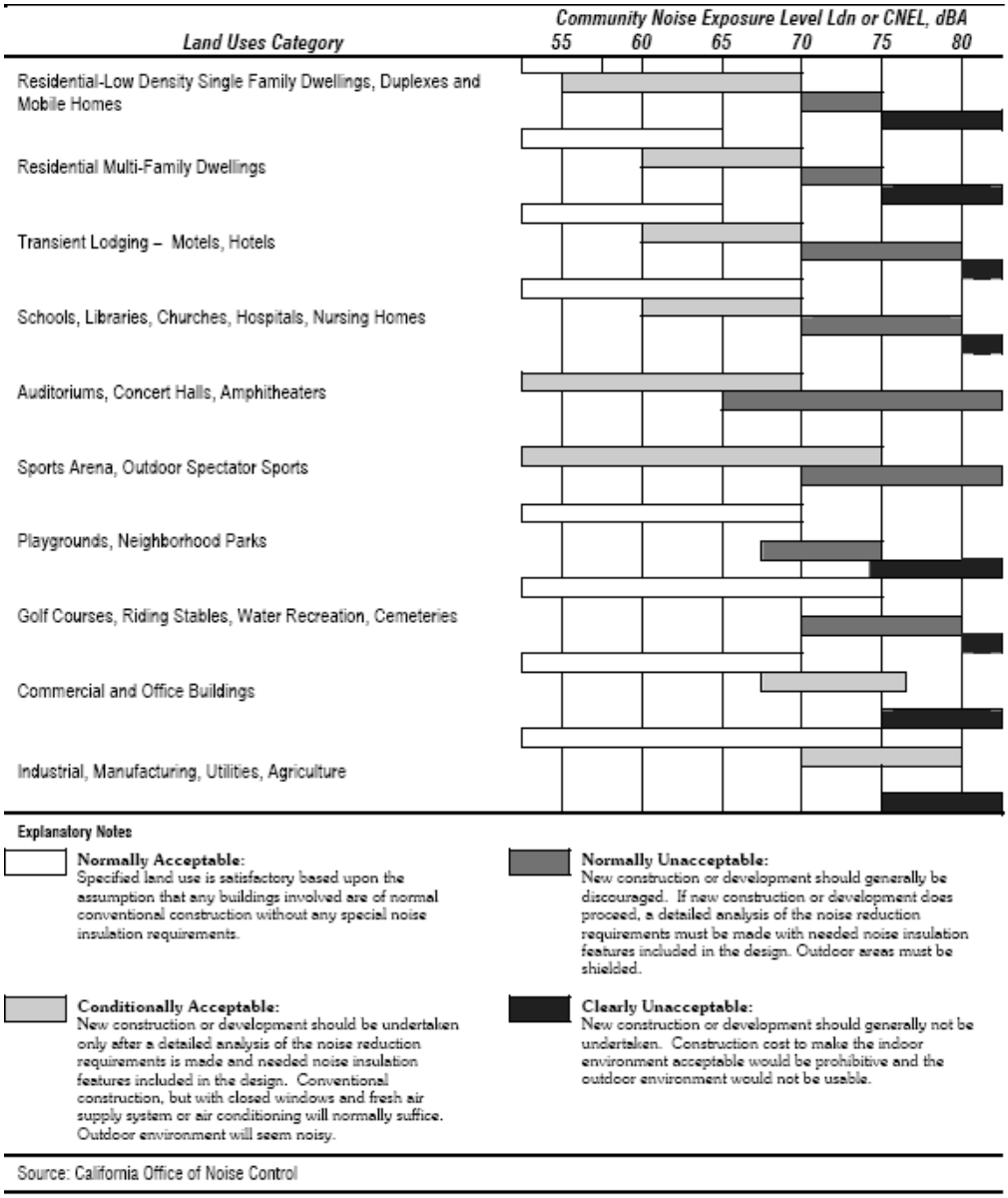
5.2 State Regulations

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 Uniform Building Code (UBC) 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 must recognize 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.

Exhibit D: Land Use Compatibility Guidelines



5.3 City of Escondido Noise Regulations

The City of Escondido outlines their noise regulations and standards within the Municipal Code and the Noise Element of the City of Escondido General Plan.

City of Escondido Municipal Code

SEC. 17-229 – Sound Level Limits

a) Unless a variance has been applied for and granted pursuant to this article, it shall be unlawful for any person to cause or allow the creation of any noise to the extent that the one-hour average sound level, at any point on or beyond the boundaries of the property on which the sound is produced, exceeds the applicable limits set forth in the following table, except that construction noise level limits shall be governed by Section 17-234 of this article.

Table 1: Allowable Exterior Noise Level[1]

Sound Level Standards (dBA Leq)*

General Plan Land Use Designation	Maximum Decibel Level	
	7 a.m. - 10 p.m.	10 p.m. - 7 a.m.
Single-Family Residential	50	45
Multiple Dwelling Residential	55	50
Commercial Zones	60	55
Light Industrial	70	70
Heavy Industrial	75	75

b) Maximum Permissible Sound Levels by Receiving Land Use.

1. The noise standards for the various categories of land use as presented in subsection (a) of this section shall, unless otherwise specifically indicated, apply to each property or portion of property substantially used for a particular type of land use reasonably similar to the land use types shown in subsection (a) of this section. Where two (2) or more dissimilar land uses occur on a single property, the more restrictive noise limits shall apply.
2. Additional land use classifications may be added by action of the city council to reflect both lower and higher existing ambient levels than those shown.
3. Where doubt exists when making identification of receiving land use, the city manager shall make an interpretation.
4. No person shall operate or cause to be operated, any source of sound at any location within the city or allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person, which causes the noise level to exceed the environmental and/or nuisance interpretation of the applicable limits given in subsection (a) of this section.
5. (A) Environmental noise shall be measured by the equivalent sound level (Leq) for such hours as are specified.

   (B) Nuisance noise shall be measured as a sound level not to be exceeded at any time.

(C) Sound levels by receiving land use shall be measured at the boundary or at any point within the boundary of the property affected.

(D) Fixed location public utility distribution or fixed transmission facilities, located on or adjacent to a property line shall be subject to noise level limits of this section measured at or beyond six (6) feet from the boundary of the easement upon which the equipment is located.

Sec. 17-234. – Construction Equipment.

Except for emergency work, it shall be unlawful for any person, including the City of Escondido, to operate construction equipment as follows:

(a) It shall be unlawful for any person, including the City of Escondido, to operate construction equipment at any construction site, except on Monday through Friday during a week between the hours of seven (7) a.m. and six (6) p.m. and on Saturdays between the hours of nine (9) a.m. and five

(5) p.m., and provided that the operation of such construction equipment complies with the requirements of subsection (d) of this section.

(b) It shall be unlawful for any person, including the City of Escondido, to operate construction equipment at any construction site on Sundays and on days designated by the president, governor or city council as public holidays.

(c) A person may operate construction equipment at his/her residence or for the purpose of constructing or modifying a residence for himself/herself on Monday through Friday of a week between the hours of seven (7) a.m. and six (6) p.m., and on Saturdays, Sundays, and holidays between the hours of nine (9) a.m. and five (5) p.m.; provided, that such operation of construction equipment is not carried on for profit or livelihood and complies with the requirements of subsection (d) of this section.

(d) No construction equipment or combination of equipment, regardless of age or date of acquisition, shall be operated so as to cause noise in excess of a one hour average sound level limit of seventy five (75) dB at any time, unless a variance has been obtained in advance from the city manager.

(e) Persons engaged in construction for profit or as a business shall post signs at conspicuous places on a construction site, indicating hours of work as prescribed by this article or authorized by permit and the applicable noise level limits.

Sec. 17-240. – General Noise Regulations.

(a) General Prohibitions. In the absence of objective measurement by use of a sound level meter, it additionally shall be unlawful for any person to make, continue or cause to be made or continued, within the limits of said city, any disturbing, excessive or offensive noise which causes discomfort or annoyance to reasonable persons of normal sensitivity.

The characteristics and conditions which should be considered in determining whether a violation of the provisions of this section exists, include, but are not limited to, the following:

(1) The level of noise;
(2) Whether the nature of the noise is usual or unusual;
(3) Whether the origin of the noise is natural or unnatural;
(4) The level of the background noise;
(5) The proximity of the noise to sleeping facilities;
(6) The nature and zoning of the area within which the noise emanates;
(7) The density of the inhabitation of the area within which the noise emanates;
(8) The time of the day or night the noise occurs;
(9) The duration of the noise;
(10) Whether the noise is recurrent, intermittent or constant; and
(11) Whether the noise is produced by a commercial or noncommercial activity.

(b) Disturbing, Excessive or Offensive Noises. The following acts are declared to be disturbing, excessive and offensive noises in violation of this section, but said enumeration shall not be deemed to be exclusive, namely:

(1) Horns, Signaling Devices, etc. Violations for disturbing, excessive or offensive noises associated with the use or operation of horns, signaling devices, etc., on automobiles, motorcycles, or any other vehicles, except as provided in section 17232 shall be prosecuted under applicable provisions of the California Vehicle Code.

(2) Radios, Television Sets, Phonographs, and Similar Devices.

(i) Uses Restricted. The use, operation or permitting to be played, used or operated, any stereo receiver, radio, cassette tape player, compact disc player, musical instrument, phonograph, television set or other device for the production or reproduction of sound in such manner as to disturb the peace, quiet and comfort of neighboring residents or persons of normal sensitivity located in the area; or in a manner to exceed those levels set forth in section 17229 when measured at a distance of twenty five (25) feet from such device operating in a public right of way or public space, whether from a mobile or fixed source, except that subject to permit issued by the City of Escondido specifying time, location and other conditions, amplified sound may be permitted within city parks, provided that said sound does not exceed a level of ninety decibels (90 dB), fifty (50) feet from the source or exceed those levels set forth in section 17229 at the park boundary.

(ii) Prima Facie Violations. The operation of any such stereo receiver, radio, cassette tape player, compact disc player, instrument, phonograph, television set, machine or similar device between the hours of ten (10) p.m. and eight (8) a.m. in such a manner and whether from a fixed or mobile source as to be plainly audible at a distance of fifty (50) feet from the

building, structure or vehicle in which it is located, or the operation of any sound amplifier, which is part of, or connected to, any radio, stereo receiver, compact disc player, cassette tape player or other similar device, when operated in such a manner and at any time and whether from a fixed or mobile source as to be plainly audible at a distance of fifty (50) feet, or when operated in such a manner as to cause a person to be aware of vibration accompanying the sound at a distance of fifty (50) feet from the source, shall be prima facie evidence of a violation of this section.

(iii) Enforcement of Prima Facie Violations.

(A) Any person who is authorized to enforce the provisions of this article and who encounters prima facie evidence of a violation of this section is empowered to confiscate and impound as evidence, any or all of the components amplifying or transmitting the sound.

(B) Any peace officer, as defined in Chapter 4.5 (commencing with Section 830) of the Penal Code, who encounters prima facie evidence of a violation of this section whereby the component(s) amplifying or transmitting the sound are attached to a vehicle may impound the vehicle, as containing evidence of a criminal offense, when the amplifying and/or transmitting component(s) cannot be readily removed from the vehicle without damaging the component(s) or the vehicle.

(3) Loud Speaking Amplifiers for Advertising. The use, operation, or the permitting to be played, used or operated of any sound production or reproduction device or machine including but not limited to radio receiving sets, phonographs, musical instruments, loudspeakers and sound amplifiers, for commercial or business advertising purposes in, upon, over or across any street, alley, sidewalk, park or public property in such a manner as to violate the provisions of this article is prohibited. This provision shall not be applicable to sound amplifying equipment mounted on any sound truck or vehicle for commercial or noncommercial purposes where the owner or operator complies with the following requirements:

(i) The only sounds permitted are music or human speech;

(ii) Operations are permitted between the hours of eight (8) a.m. and nine (9) p.m. or after nine (9) p.m. during public
events and affairs of interest to the general public;

(iii) Sound amplifying equipment shall not be operated unless the sound truck upon which such equipment is mounted is operated at a speed of at least ten (10) miles per hour, except when said truck is stopped or impeded by traffic. Where stopped by traffic the said sound amplifying equipment shall not be operated for longer than one minute at each stop.

(iv) Sound shall not be issued within one hundred (100) yards of hospitals, schools, churches, or courthouses, or other noise sensitive zones.

(v) The volume of sound shall be controlled so that said volume is not raucous, jarring, disturbing or a nuisance to persons within the area of audibility and so that the volume of sound shall not exceed a sound level of 65 decibels (on the“A” scale) at a distance of 60 feet from the sound amplifying equipment as measured by a sound level meter which meets the American National Standard ANSI SI.41971 or the latest revision thereof.

(vi) No sound amplifying equipment shall be operated unless the axis of the center of any sound reproducing equipment used shall be parallel to the direction of travel of the sound

truck; provided, however, that any sound reproducing equipment may be so placed upon said sound truck as to not vary more than fifteen (15) degrees on either side of the axis of the center of the direction of travel.

(vii) No sound truck with its amplifying device in operation shall be driven on the same street past the same point more than twice in a period of one hour.

(4) Yelling, Shouting, etc. Disturbing or raucous yelling, shouting, hooting, whistling or singing on the public streets, particularly between the hours of ten (10) p.m. and eight (8) a.m. or at any time or place so as to annoy or disturb the quiet, comfort or repose of neighboring residents or persons of normal sensitivity within the area for whatever reason, is prohibited.

(5) Animals. The keeping or maintenance, or the permitting to be kept or maintained upon any premises owned, occupied or controlled by any person of any animal, which includes fowl, which by any frequent or long continued noise shall cause annoyance or discomfort to persons of normal sensitivity in the vicinity; provided, however, that nothing contained herein shall be construed to apply to occasional noises emanating from legally operated dog and cat hospitals, humane societies, pounds, farm or agricultural facilities, or areas where keeping of animals is permitted. The written affirmation by two (2) persons having separate residences in the vicinity of the alleged violation that such violation of this section disturbs the peace and quiet of said persons shall be prima facie evidence of a violation of this section.

(6) Schools, Courts, Churches, Hospitals. The creation of any noise on any street, sidewalk or public place adjacent to any school, institution of learning (except recreational areas of schools), church, court, library or other noise sensitive zone, while the same are in use, or adjacent to a hospital, rest home, or long term medical or mental care facility which noise interferes with the workings of such institution or which disturbs or annoys patients in the hospital, rest home, or long term medical or mental care facility, provided conspicuous signs are displayed in such streets, sidewalks or public places indicating the presence of a school, institution of learning, church, court, library, rest home, long term medical or mental care facility, or other noise sensitive zones, is prohibited.

(7) Steam Whistles. The operation, use or causing to be operated or used of any steam whistle attached to any stationary boiler is prohibited except to give notice of the time to start or stop work or as a sound signal of imminent danger.

(8) Engines and Motor Vehicles. Any disturbing or raucous noises caused off streets or highways by racing or accelerating the engine of any motor vehicle while moving or not moving, by the willful backfiring of any engine and exhaust from the engine tailpipe or muffler, or from the screeching of tires, is prohibited.

(9) Loading, Unloading Vehicles—Opening, Destroying Bales, Boxes. The creation of a loud and excessive noise in connection with loading or unloading any vehicle or the opening and destruction of bales, boxes, crates and containers is a violation of this article.

(10) Transporting Metal Rails, Pillars, Columns. The loading or unloading or transportation of rails, pillars or columns of iron, steel or other material over and along streets and other public places upon carts, drays, cars, trucks, or in any other manner so loaded as to cause loud noises or as to disturb the peace and quiet of such streets or other public places is a violation of this article.

(11) Drums, Other Instruments to Attract Attention. No person shall use any drum or other instrument or device for the purpose of attracting attention by the creation of noise to any performance, show or sale.

(12) Pile Drivers, Pneumatic Hammers, etc. No person shall operate between the hours of six (6) p.m. and seven (7) a.m. on weekdays, or on Saturdays, Sundays or any legal holidays, any pile driver, pneumatic hammer, derrick, or other similar appliance, the use of which is attended by loud or unusual noise, unless a variance has been obtained in advance from the city manager.

(13) Peddlers, Hawkers, Vendors. The shouting and crying of peddlers, hawkers and vendors which disturbs the peace and quiet of the neighborhood is a violation of this article.

(14) Exhaust Emissions. No person shall discharge into the open air the exhaust of any steam engine, stationary internal combustion engine, blower, power fan, or motor vehicle except through a muffler or other device which will effectively prevent loud or explosive noises therefrom.

Sec. 17-42 - Exemptions.

(a) Emergency Work. The provisions of this article shall not apply to any emergency work as defined in section 17227, provided that (1) a variance has been obtained from the city manager, and (2) any vehicle device, apparatus or equipment used, related to or connected with emergency work is designed, modified or equipped to reduce sounds produced to the lowest possible level consistent with effective operation of such vehicle, device, apparatus, or equipment.

(b) Sporting, Entertainment, Public Events. The provisions of this article shall not apply to:

(1) Those reasonable sounds emanating from authorized school bands, school athletic and school entertainment events.

(2) Sporting, entertainment and public events which are conducted pursuant to a license or permit issued by the building director for noise exceeding criteria, standards or levels as set forth in this article.

(3) Those reasonable sounds emanating from a sporting, entertainment or public event; provided, however, it shall be unlawful to exceed those levels set forth in section 17229 when measured at or within the property lines of any property which is developed and used either in part or in whole for residential purposes unless a variance has been granted allowing sounds in excess of said levels.

(c) Federal or State Preempted Activities. The provisions of this article shall not apply to any activity to the extent regulation thereof has been preempted by date or federal law.

(d) Minor Maintenance to Residential Property. The provisions of section 17229 shall not apply to noise sources associated with minor maintenance to property used either in part or in whole for residential purposes provided said activities take place between the hours of seven (7) a.m. and eight (8) p.m. on any day except Sunday, or between the hours of ten (10) a.m. and eight (8) p.m. on Sunday.

(e) Agricultural Operations. The provisions of section 17229 shall not apply to equipment associated with agricultural operations, provided, that all equipment and machinery powered by internal combustion engines is equipped with a proper muffler and air intake silencer in good working order, and provided further that:

(1) Operations do not take place between seven (7) p.m. and the following seven (7) a.m.; or

(2) Such operations and equipment are utilized for the preparation, planting, harvesting, protection or salvage of agricultural crops during periods of potential or actual frost damage or other adverse weather conditions; or
(3) Such operations and equipment are associated with agricultural pest control, provided the application is made in accordance with regulations or procedures administered by the county department of agriculture; or
(4) Such operations and equipment are associated with the application of agricultural chemicals provided the application is made in accordance with acceptable agricultural practices or upon the recommendation of an agricultural specialist.

City of Escondido General Plan

Chapter IV. Community Protection from the City's General Plan includes Section G noise. Section G describes sensitive land uses as Land uses located throughout the city in areas where the impact of noise could affect their operation or activity. Locations of certain noise-sensitive receptors and noise generators are identified in Figure VI-10 and also include:

- Residential Development and care facilities
- Schools, churches and transient lodging
- Hospitals and health care facilities
- Libraries, museums, cultural facilities
- Golf courses and passive recreational sites

Noise exposure levels for a variety of land uses are identified in Figure VI-12. Minimizing noise exposure to sensitive areas is important to ensure the proper function of land uses and to maintain quality of life.

Goals, Policies, and Implementation Measures

Policies, goals and implementation program measures from the Noise Element that would mitigate potential impacts on noise include the following.

Goal 5: Protection of the community from excessive noise exposure.

Noise Policy 5.1 Require development to meet acceptable exterior noise level standards as established in Figure VI-2, and use the future noise contour map (FigureVI-17) as a guide for evaluating the compatibility of new noise sensitive uses with projected noise levels.

Noise Policy 5.2 Apply a CNEL of 60 dB or less for single family and 65 dB or less for multi-family as goals where outdoor use is a major consideration (back yards and single family housing developments, and recreation areas in multifamily housing developments) as discussed in Figure VI-13, and recognize that such levels may not necessarily be achievable in all residential areas.

Noise Policy 5.3 Require noise attenuation for outdoor spaces in all developments where projected incremental exterior noise levels exceed those shown in Figure VI-14.

Noise Policy 5.4 Require noise attenuation for new noise-sensitive uses which include residential, daycare facilities, schools, churches, transient lodging, hotels, motels, hospitals, health care facilities, and libraries if the projected interior noise standard of 45 dBA CNEL is exceeded.

Noise Policy 5.5 Require construction projects and new development to ensure acceptable vibration levels at nearby noise-sensitive uses based on Federal Transit Administrator criteria.

Noise Policy 5.6 Require the preparation of noise studies, as deemed necessary by the Planning Department, to analyze potential noise impacts associated with new development which could significantly alter existing noise levels in accordance with provisions outlined in Figure VI-14.

Noise Policy 5.7 Encourage use of site and building design, noise barriers, and construction methods as outlined in Figure VI-15 to minimize impacts on and from new development.

Noise Policy 5.8 Require that mixed use and multi-family residential developments demonstrate that the design of the structure will adequately isolate noise between adjacent uses (orientation, window insulation, separation of common walls, floors, and ceilings, etc.).

Noise Policy 5.9 Require new mixed-use developments to locate loading areas, parking lots, driveways, trash enclosures, mechanical equipment, and other noise sources away from the residential portion of the development, when physically feasible. Use construction standards to reduce noise between uses.

Noise Policy 5.10 Require development projects that are subject to discretionary approval to assess potential construction noise impacts on nearby sensitive uses and to minimize impacts on these uses, to the extent feasible.

Noise Policy 5.11 Limit direct access from individual properties along Major Roads and Prime Arterials in residential areas in order to minimize gaps in nose barrier sound walls.

Noise Policy 5.12 Limit “through truck traffic” to designated routes to minimize noise impacts to residential neighborhoods and other noise-sensitive uses (see Mobility and Infrastructure Element).

Noise Policy 5.13 Limit the hours of operation for parks and active recreation uses in residential areas to minimize disturbance to residents.

Noise Policy 5.14 Coordinate among city, county, State and other agencies involved in noise abatement to reduce noise generated from outside the city.

Noise Policy 5.15 Coordinate with McClellan-Palomar Airport to distribute property disclosure statements for areas within the Airport Land Use Compatibility Plan.

Noise Policy 5.16 Work with McClellan-Palomar Airport to monitor aircraft noise, implement noise-reducing operation measures, as necessary, and pro-mote pilot awareness of noise sensitive land uses.

Noise Policy 5.17 Periodically review the adopted noise ordinance to address changing conditions.

City of San Marcos Municipal Code

Section 20.300.070 of the San Marcos Municipal Code states that no person shall create or allow the creation of exterior noise that causes the noise level to exceed the noise standards established by Table 20.300-4. Increases in allowable noise levels listed in Table 20.300-4 may be permitted in accordance with the standards outlined in Table 20.300-5.

Zone	Allowable Noise Level (dBA Leq) Measured from the Property Line
Single-Family Residential (A, R-1, R-2) [1, 2]	
7 a.m. to 10 p.m. (daytime)	60
10 p.m. to 7 a.m. (overnight)	50
Multifamily Residential (R-3) [1, 2]	
7 a.m. to 10 p.m. (daytime)	65
10 p.m. to 7 a.m. (overnight)	55
Commercial (C, O-P, SR) [3]	
7 a.m. to 10 p.m. (daytime)	65
10 p.m. to 7 a.m. (overnight)	55
Industrial	
7 a.m. to 10 p.m. (daytime)	65
10 p.m. to 7 a.m. (overnight)	60

6.0 Study Method and Procedure

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

6.1 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 Federal Highway Transportation (FHWA) 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

6.2 Noise Measurement Locations

Noise monitoring locations were selected based on the nearest sensitive receptors relative to the proposed onsite noise sources. one (1) long-term 24-hour noise measurements was conducted at or near the project site and are illustrated in Exhibit E. Appendix A includes photos, field sheet, and measured noise data.

6.3 Stationary Noise Modeling

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, truck loading dock with an idling semi-truck). The model assumes approximately 151 parking spots and three (3) truck loading docks, a proposed 6 foot sound wall and an existing 8 foot CMU wall at the west property line.

The loading dock was calibrated with a reference level of 74 dBA at 10 feet. The reference sound level data is provided in Appendix B.

The SP model assumes that all noise sources are operating simultaneously (worst-case scenario), when in actuality the noise will be intermittent and lower in noise level. SP modeling inputs and outputs ate provided in Appendix C.

6.4 FHWA Traffic Noise Prediction Model

Traffic noise from vehicular traffic was projected using a computer program that replicates the FHWA Traffic Noise Prediction Model (FHWA-RD-77-108). 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 project's Average Daily Trips (ADT) provided by Linscott, Law & Greenspan, Engineers, The City's traffic counts, and roadway classification. The referenced traffic data of 669 daily trips 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 2 indicates the roadway parameters and vehicle distribution utilized for this study.

Table 2: Roadway Parameters and Vehicle Distribution

Roadway	Segment	Existing ADT	Existing Plus Project ADT	Speed (MPH)	Site Conditions
Mission Road	Barham Dr to Nordahl Rd	20,600	21,269	45	Soft
Vehicle Distribution (Truck 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		75.5	14.0	10.5	97.42
Medium Trucks		48.9	2.2	48.9	1.84
Heavy Trucks		47.3	5.4	47.3	0.74

Notes:
[1] Traffic counts provided by Sandag City of Escondido Appendix D.

The following outlines key adjustments to the REMEL for project site parameter inputs:

- Vertical and horizontal distances (Sensitive receptor distance from noise source)
- Noise barrier vertical and horizontal distances (Noise barrier distance from sound source and receptor).
- Traffic noise source spectra
- Topography

6.5 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.

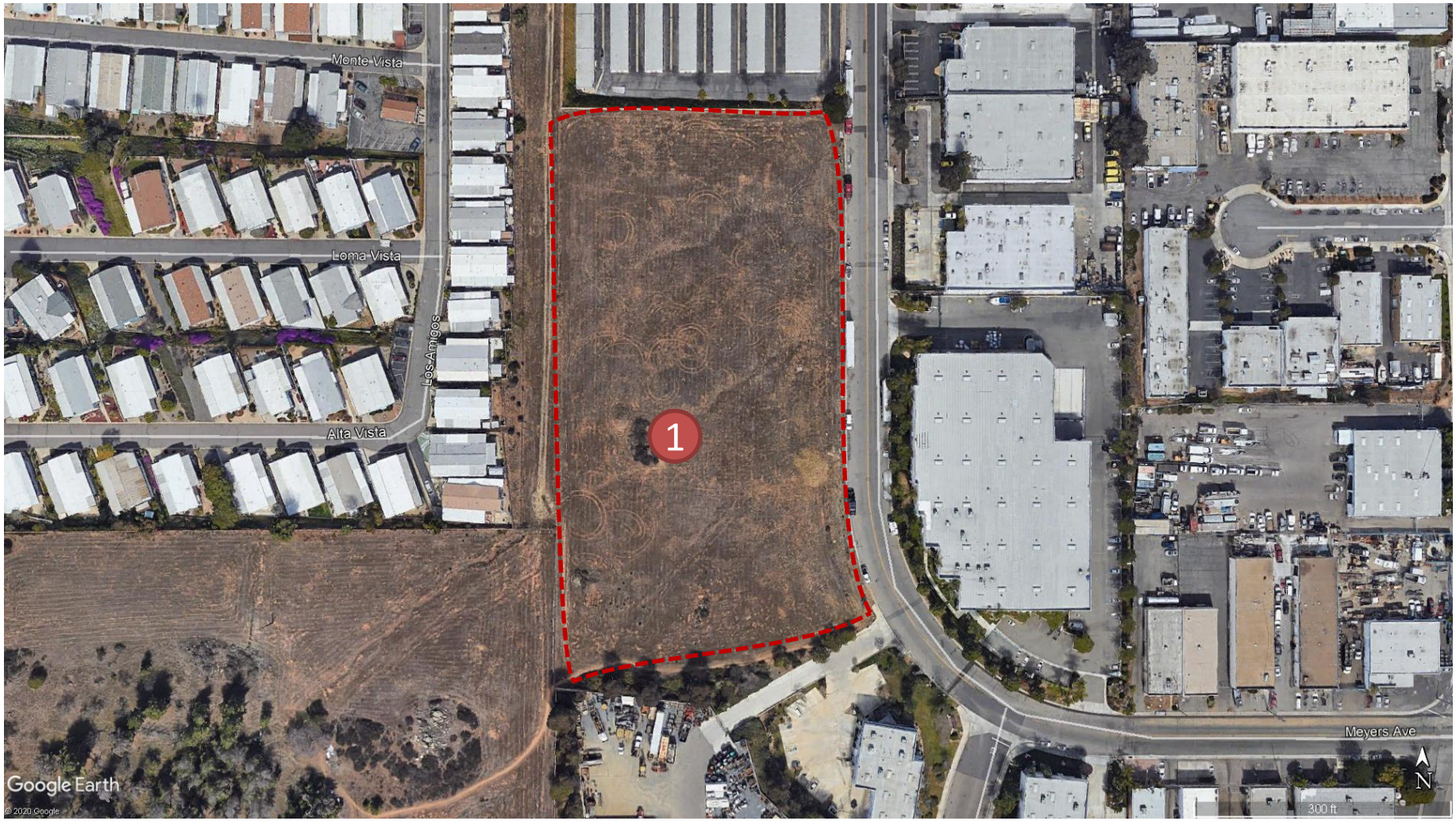
The project was analyzed based on the different construction phases. Construction noise is expected to be loudest during the grading, concrete and building phases of construction. The construction noise calculation output worksheet is located in Appendix E. The following assumptions relevant to short-term construction noise impacts were used:

- It is estimated that construction will occur over a 6 to 8-month time period. Construction noise is expected to be the loudest during the grading, concrete, and building phases.

1 = short-term
Monitoring Location

Exhibit E

Measurement Locations



7.0 Existing Noise Environment

One (1) 24-hour ambient noise measurement was conducted at the project site. Noise measurements were taken to determine the existing ambient noise levels. Noise data indicates that traffic along Meyers Avenue and surrounding businesses are the primary sources of noise impacting the site and the surrounding area.

7.1 Long-Term Noise Measurement Results

The results of the long-term noise data are presented in Table 3.

Table 3: Long-Term Noise Measurement Data[1]

Date	Time	dB(A)							
		L_{EQ}	L_{MAX}	L_{MIN}	L_2	L_8	L_{25}	L_{50}	L_{90}
11/11/2020	8AM-9AM	50.0	60.7	44.6	55.4	52.6	51.7	49.3	47.2
11/11/2020	9AM-10AM	49.0	59.7	43.6	54.4	51.6	50.7	48.3	46.2
11/11/2020	10AM-11AM	48.9	59.6	43.5	54.3	51.5	50.6	48.2	46.1
11/11/2020	11AM-12PM	49.1	59.8	43.7	54.5	51.7	50.8	48.4	46.3
11/11/2020	12PM-1PM	49.2	59.9	43.8	54.6	51.8	50.9	48.5	46.4
11/11/2020	1PM-2PM	49.3	60.0	43.9	54.7	51.9	51.0	48.6	46.5
11/11/2020	2PM-3PM	49.5	60.2	44.1	54.9	52.1	51.2	48.8	46.7
11/11/2020	3PM-4PM	50.7	61.4	45.3	56.1	53.3	52.4	50.0	47.9
11/11/2020	4PM-5PM	52.2	62.9	46.8	57.6	54.8	53.9	51.5	49.4
11/11/2020	5PM-6PM	51.9	62.6	46.5	57.3	54.5	53.6	51.2	49.1
11/11/2020	6PM-7PM	50.1	60.8	44.7	55.5	52.7	51.8	49.4	47.3
11/11/2020	7PM-8PM	48.8	59.5	43.4	54.2	51.4	50.5	48.1	46.0
11/11/2020	8PM-9PM	47.7	58.4	42.3	53.1	50.3	49.4	47.0	44.9
11/11/2020	9PM-10PM	47.0	57.7	41.6	52.4	49.6	48.7	46.3	44.2
11/11/2020	10PM-11PM	46.0	56.7	40.6	51.4	48.6	47.7	45.3	43.2
11/11/2020	11PM-12AM	45.4	56.1	40.0	50.8	48.0	47.1	44.7	42.6
11/12/2020	12AM-1AM	43.8	54.5	38.4	49.2	46.4	45.5	43.1	41.0
11/12/2020	1AM-2AM	41.4	52.1	36.0	46.8	44.0	43.1	40.7	38.6
11/12/2020	2AM-3AM	40.1	50.8	34.7	45.5	42.7	41.8	39.4	37.3
11/12/2020	3AM-4AM	38.4	49.1	33.0	43.8	41.0	40.1	37.7	35.6
11/12/2020	4AM-5AM	39.4	50.1	34.0	44.8	42.0	41.1	38.7	36.6
11/12/2020	5AM-6AM	43.2	53.9	37.8	48.6	45.8	44.9	42.5	40.4
11/12/2020	6AM-7AM	49.6	60.3	44.2	55.0	52.2	51.3	48.9	46.8
11/12/2020	7AM-8AM	51.9	62.6	46.5	57.3	54.5	53.6	51.2	49.1
CNEL		52.6							

Notes:
[1.] Long-term noise monitoring location (LT1) is illustrated in Exhibit E. The quietest hourly daytime noise interval is highlighted in Orange when project operations could occur.

Noise data indicates that the quietest daytime ambient noise level measured 47 dBA at the project site. Additional field notes and photographs are provided in Appendix A.

For this evaluation, MD has utilized the measured Leq and has compared the project's projected noise levels to this level.

8.0 Future Noise Environment Impacts

This assessment analyzes future noise impacts as a result of the project. The analysis details the estimated exterior noise levels. Stationary noise impacts are analyzed from the on-site noise sources such as parking and on-site operations.

8.1 Future Exterior Noise

The following outlines the exterior noise levels associated with the proposed project.

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

Sensitive receptors that may be affected by project operational noise includes residential uses to the west. The worst-case stationary noise was modeled using SoundPLAN acoustical modeling software.
For this study, project activities are assumed always operational when in reality the noise will be intermittent. As a worst-case scenario, the project evaluates the loading dock noise for three (3) docks. Exhibit F provides the site plan with the three (3) loading docks.

A total of three (3) receptors were modeled to evaluate the proposed project's operational impact. A receptor is denoted by a yellow dot. All yellow dots represent either a property line or a sensitive receptor such as an outdoor sensitive area (courtyard, patio, backyard, etc).

This study compares the Project's operational noise levels to two (2) different noise assessment scenarios: 1) Project Only operational noise level projections, 2) Project plus ambient noise level projections.

Project Operational Noise Levels
Exhibit F shows the "project only" operational noise levels at the project site and illustrates how the noise will propagate at the property lines and/or sensitive receptor area. Operational noise levels at the adjacent uses are anticipated to range between 39 dBA to 43 dBA Leq (depending on the location).

Project Plus Ambient Operational Noise Levels
Table 4 demonstrates the project plus the ambient noise levels. Project plus ambient noise level projections are anticipated measure 48 dBA Leq depending on location.

Table 4: Worst-case Predicted Operational Leq

Receptor[1]	Floor	Existing Ambient Noise Level (dBA, Leq)[2]	Project Noise Level (dBA, Leq)[3]	Total Combined Noise Level (dBA, Leq)	Nighttime (10PM – 7AM) Stationary Noise Limit (dBA, Leq)[4]	Change in Noise Level as Result of Project
1	1	47	42	48	**50**	1
2	1		39	48	**60**	1
3	1		42	48	**50**	1
4	1		43	50	**60**	1

Notes:
[1.] Receptors 2 and 3 represent commercial. Receptor1 and 4 represents multi family residential.
[2.] Existing ambient taken as one-hour measurement.
[3.] See Exhibit F for the operational noise level projections at said receptors.
[4.] Sec 17-29 of the Escondido Municipal code used as it is the most restrictive noise ordinance.

As shown in Table 4, the project will increase the worst-case noise level by approximately 1 dBA Leq depending on location. It takes a change of 3 dBA to hear a noticeable difference.

Table 5 provides the characteristics associated with changes in noise levels.

Table 5: Change in Noise Level Characteristics[1]

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 fall within the “Not Perceptible” to “Just Perceptible” acoustic characteristic depending on location and only in a worst-case scenario with three semi-trucks idling at the same time. Therefore, the change in noise level would be less than significant at the adjacent uses.

8.1.2 Noise Impacts to On/Off-Site Receptors Due to Project Generated Traffic

A worst-case project generated traffic noise level was modeled utilizing the FHWA Traffic Noise Prediction Model - FHWA-RD-77-108. Traffic noise levels were calculated 50 feet from the centerline of the analyzed roadway. The modeling is theoretical and does not take into account any existing barriers, structures, and/or topographical features that may further reduce noise levels. Therefore, the levels are shown for comparative purposes only to show the difference in with and without project conditions. In addition, the noise contours for 60, 65 and 70 dBA CNEL were calculated. The potential off-site noise impacts caused by an increase of traffic from operation of the proposed project on the nearby roadways were calculated for the following scenarios:

Existing Year (without Project): This scenario refers to existing year traffic noise conditions.

Existing Year (Plus Project): This scenario refers to existing year + project traffic noise conditions.

Table 6 compares the without and with project scenario and shows the change in traffic noise levels as a result of the proposed project. It takes a change of 3 dB or more to hear a perceptible difference. As demonstrated in Table 6, the project is anticipated to change the noise 0.1 dBA CNEL.

Although there is an increase in traffic noise levels the impact is considered to have no impact as the noise levels at or near any existing proposed sensitive receptor would be 73.0 dBA CNEL or less and the change in noise level is 3 dBA or less.

Table 6: Existing Scenario - Noise Levels Along Roadways (dBA CNEL)

Existing Without Project Exterior Noise Levels

Roadway	Segment	CNEL at 50 Ft (dBA)	Distance to Contour (Ft)			
			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
Mission Rd	Barham Dr to Nordahl Road	73.0	79	170	366	789

Existing With Project Exterior Noise Levels

Roadway	Segment	CNEL at 50 Ft (dBA)	Distance to Contour (Ft)			
			70 dBA CNEL	65 dBA CNEL	60 dBA CNEL	55 dBA CNEL
Mission Rd	Barham Dr to Nordahl Road	73.1	81	174	374	806

Change in Existing Noise Levels as a Result of Project

Roadway[1]	Segment	CNEL at 50 Feet dBA[2]			
		Existing Without Project	Existing With Project	Change in Noise Level	Potential Significant Impact
Mission Rd	Barham Dr to Nordahl Road	73.0	73.1	0.1	No

Notes:
[1] Exterior noise levels calculated at 5 feet above ground level.
[2] Noise levels calculated from centerline of subject roadway.

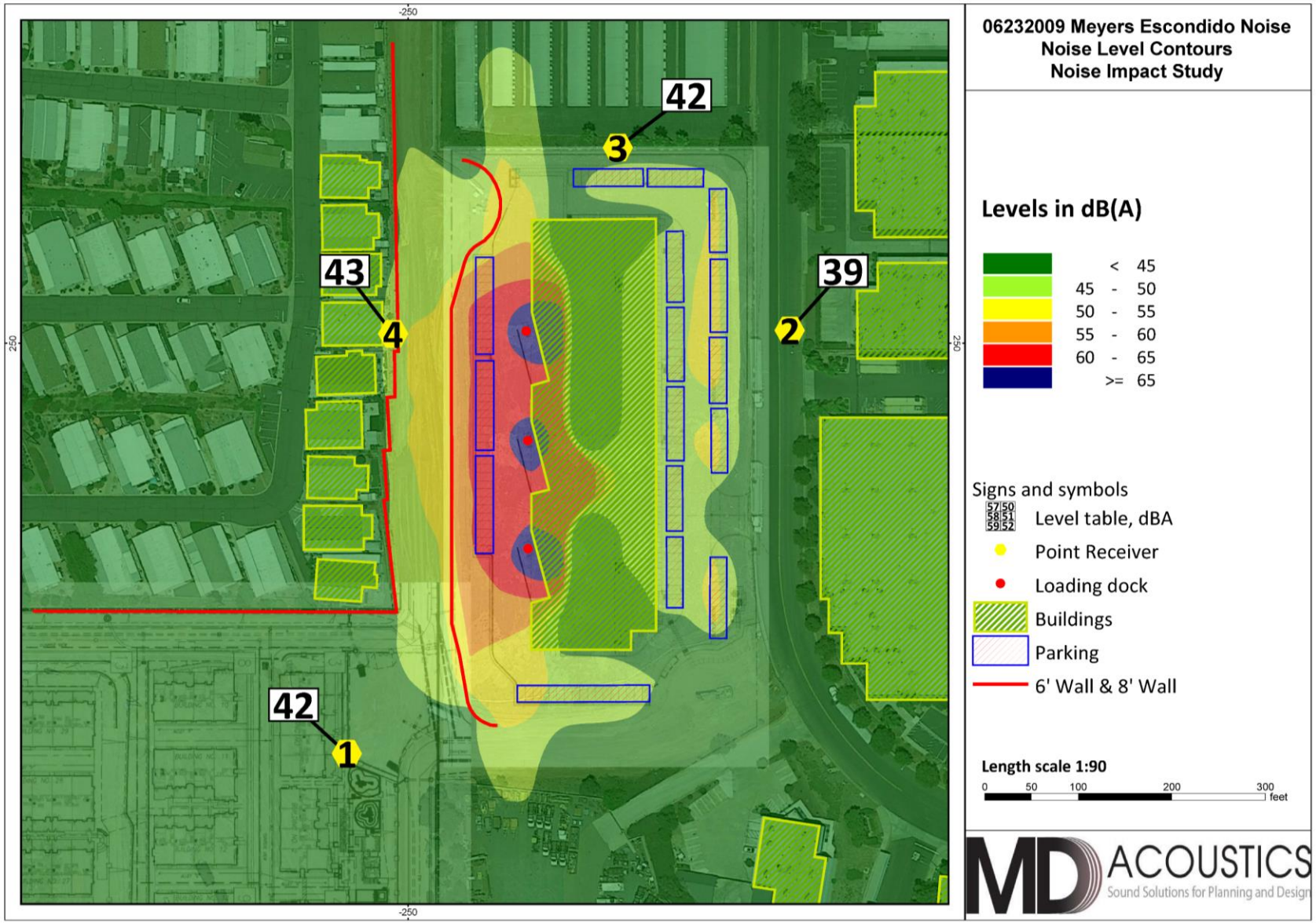
8.2 Project Design Features

The following noise reduction measure has been implemented into the plan:

- All roof-top exterior equipment will be shielded from view with solid parapets that are taller than the equipment constructed with material with a density of at least 4 lb/ft2.

Exhibit F

Operational Noise Levels Leq(h)



9.0 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.

9.1 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 7.

Table 7: Typical Construction Equipment Noise Levels[1]

Type	Lmax (dBA) at 50 Feet
Backhoe	80
Truck	88
Concrete Mixer	85
Pneumatic Tool	85
Pump	76
Saw, Electric	76
Air Compressor	81
Generator	81
Paver	89
Roller	74

Notes:
[1] Referenced Noise Levels from FTA noise and vibration manual.

Construction noise is considered a short-term impact and would be considered significant if construction activities are taken outside the allowable times as described in the City's Municipal Code Section 17-234. Construction is anticipated to occur during the permissible hours according to 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. Furthermore, noise reduction measures are provided to further reduce construction noise. The impact is considered to have no impact however construction noise level projections are provided.

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 will be loudest during grading phase. A likely worst-case construction noise scenario during grading assumes the use of 1-grader, 1-dozer, 1-excavators, 1-scrapers and 3-backhoes operating at 225 feet from the nearest sensitive receptor.

Assuming a usage factor of 40 percent for each piece of equipment, unmitigated noise levels at 225 feet have the potential to reach 71 dBA L_{eq} at the nearest sensitive receptors during building construction. Noise levels for the other construction phases would be lower, approximately 69 dBA.

9.2 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 bulldozer. A large bulldozer has a vibration impact of 0.089 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:

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

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 Equipment[1]

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.

At a distance of 30 feet, a large bulldozer would yield a worst-case 0.073 PPV (in/sec) which may be perceptible for short periods of time during grading along the southern property line of the project site, but is below any threshold of damage. The project will have no impact and no mitigation is required.

9.3 Construction Noise Reduction Measures

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

1. Construction should occur during the permissible hours as defined in Section 17-234.

2. During construction, the contractor shall ensure all construction equipment is equipped with appropriate noise attenuating devices.

3. The contractor should locate equipment staging areas that will create the greatest distance between construction-related noise/vibration sources and sensitive receptors nearest the project site during all project construction.

4. Idling equipment should be turned off when not in use.

5. Equipment shall be maintained so that vehicles and their loads are secured from rattling and banging.

10.0 References

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

City of Escondido: General Plan Noise Element. Chapter IV.

City of Lake Elsinore: Municipal Code. Chapter 17 Noise Abatement and Control

Sandag City of Escondido Traffic Counts

Appendix A:

Photographs and Field Measurement Data

MD ACOUSTICS
Sound Solutions for Planning and Design
www.mdacoustics.com

AZ Office
4960 S. Gilbert Rd, Ste 1-461
Chandler, AZ 85249

CA Office
1197 E Los Angeles Ave, C-256
Simi Valley, CA 93065

24-Hour Continuous Noise Measurement Datasheet

Project:	Meyers Industrial	**Site Observations:**	Clear sky, Temps in The 70's
Site Address/Location:	2351 Meyers Avenue		
Date:	11/11/2020-11/12/2020		
Field Tech/Engineer:	Jason Schuyler		

General Location:

Sound Meter:	NTi XL2	**SN:** 80206	
Settings:	A-weighted, slow, 1-min, 24-hour duration		
Meteorological Con.:	77 degrees F, 2 to 5 mph wind, eastern direction		
Site ID:	LT-1		

Site Topo: Flat

Ground Type: Soft site, Open raw ground with a road

Noise Source(s) w/ Distance:

LT1 is 182' From Meyers Ave

LT1 is 242'. from nearest residential property

Figure 1: LT-1 Monitoring Location

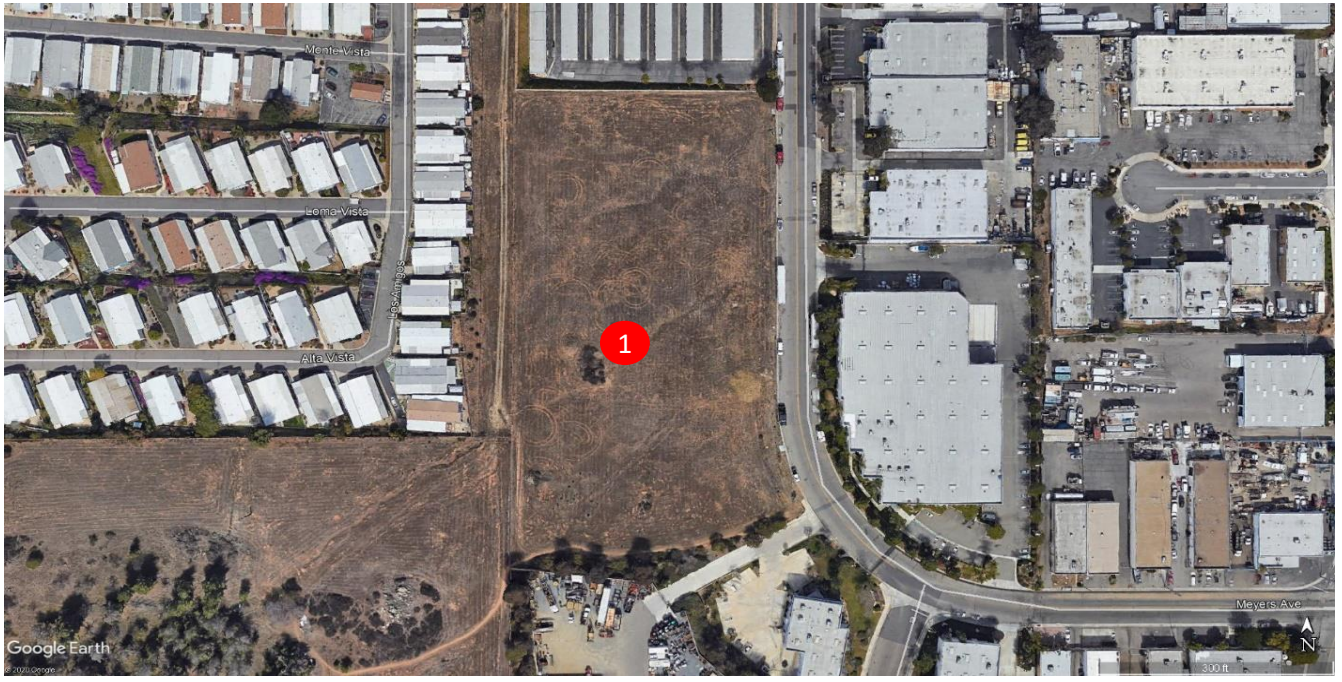


Figure 2: LT-1 Photo

MD ACOUSTICS
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AZ Office
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Chandler, AZ 85249

CA Office
1197 E Los Angeles Ave, C-256
Simi Valley, CA 93065

24-Hour Noise Measurement Datasheet - Cont.

Project: Meyers Industrial **Day:** 1 of 1

Site Address/Location: 2351 Meyers Avenue

Site ID: LT-1

Date	Start	Stop	Leq	Lmax	Lmin	L2	L8	L25	L50	L90
11/11/2020	8:00 AM	9:00 AM	50.0	60.7	44.6	55.4	52.6	51.7	49.3	47.2
11/11/2020	9:00 AM	10:00 AM	49.0	59.7	43.6	54.4	51.6	50.7	48.3	46.2
11/11/2020	10:00 AM	11:00 AM	48.9	59.6	43.5	54.3	51.5	50.6	48.2	46.1
11/11/2020	11:00 AM	12:00 PM	49.1	59.8	43.7	54.5	51.7	50.8	48.4	46.3
11/11/2020	12:00 PM	1:00 PM	49.2	59.9	43.8	54.6	51.8	50.9	48.5	46.4
11/11/2020	1:00 PM	2:00 PM	49.3	60.0	43.9	54.7	51.9	51.0	48.6	46.5
11/11/2020	2:00 PM	3:00 PM	49.5	60.2	44.1	54.9	52.1	51.2	48.8	46.7
11/11/2020	3:00 PM	4:00 PM	50.7	61.4	45.3	56.1	53.3	52.4	50.0	47.9
11/11/2020	4:00 PM	5:00 PM	52.2	62.9	46.8	57.6	54.8	53.9	51.5	49.4
11/11/2020	5:00 PM	6:00 PM	51.9	62.6	46.5	57.3	54.5	53.6	51.2	49.1
11/11/2020	6:00 PM	7:00 PM	50.1	60.8	44.7	55.5	52.7	51.8	49.4	47.3
11/11/2020	7:00 PM	8:00 PM	48.8	59.5	43.4	54.2	51.4	50.5	48.1	46.0
11/11/2020	8:00 PM	9:00 PM	47.7	58.4	42.3	53.1	50.3	49.4	47.0	44.9
11/11/2020	9:00 PM	10:00 PM	47.0	57.7	41.6	52.4	49.6	48.7	46.3	44.2
11/11/2020	10:00 PM	11:00 PM	46.0	56.7	40.6	51.4	48.6	47.7	45.3	43.2
11/11/2020	11:00 PM	12:00 AM	45.4	56.1	40.0	50.8	48.0	47.1	44.7	42.6
11/12/2020	12:00 AM	1:00 AM	43.8	54.5	38.4	49.2	46.4	45.5	43.1	41.0
11/12/2020	1:00 AM	2:00 AM	41.4	52.1	36.0	46.8	44.0	43.1	40.7	38.6
11/12/2020	2:00 AM	3:00 AM	40.1	50.8	34.7	45.5	42.7	41.8	39.4	37.3
11/12/2020	3:00 AM	4:00 AM	38.4	49.1	33.0	43.8	41.0	40.1	37.7	35.6
11/12/2020	4:00 AM	5:00 AM	39.4	50.1	34.0	44.8	42.0	41.1	38.7	36.6
11/12/2020	5:00 AM	6:00 AM	43.2	53.9	37.8	48.6	45.8	44.9	42.5	40.4
11/12/2020	6:00 AM	7:00 AM	49.6	60.3	44.2	55.0	52.2	51.3	48.9	46.8
11/12/2020	7:00 AM	8:00 AM	51.9	62.6	46.5	57.3	54.5	53.6	51.2	49.1

CNEL: 52.6

MD ACOUSTICS
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AZ Office
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Chandler, AZ 85249

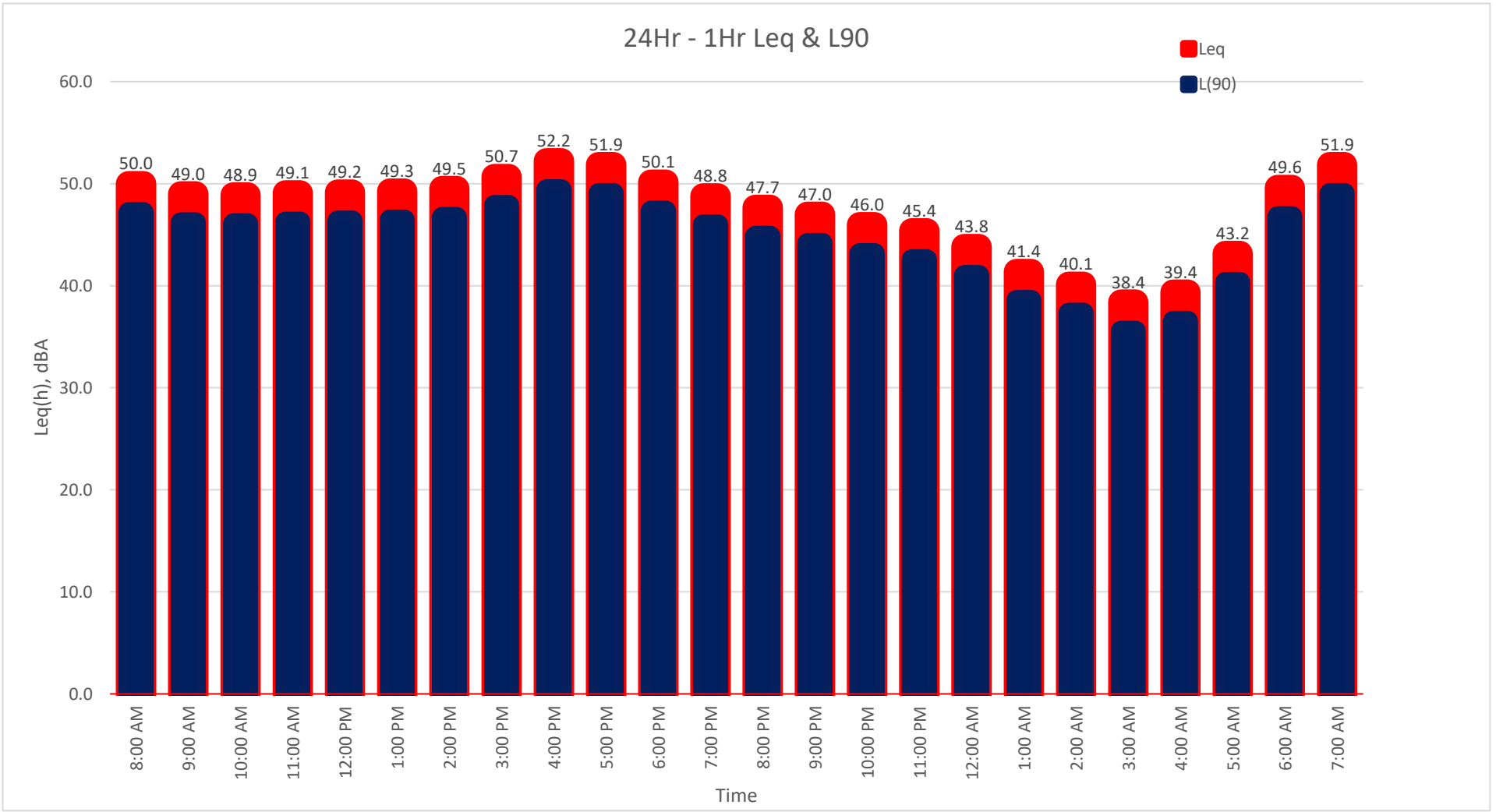
CA Office
1197 E Los Angeles Ave, C-256
Simi Valley, CA 93065

24-Hour Continuous Noise Measurement Datasheet - Cont.

Project: Meyers Industrial **Day:** 1 of 1

Site Address/Location: 2351 Meyers Avenue

Site ID: LT-1



Appendix B:

Manufacturers Cut Sheet

MD ACOUSTICS
Sound Solutions for Planning and Design
www.mdacoustics.com

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: N/A
Site Location: MD Acoustics and Labs 170 S. William Dillard Dr. Suite 103
Date: 8/11/2020
Field Tech/Engineer: Shon Baldwin
Source/System: Semi Truck

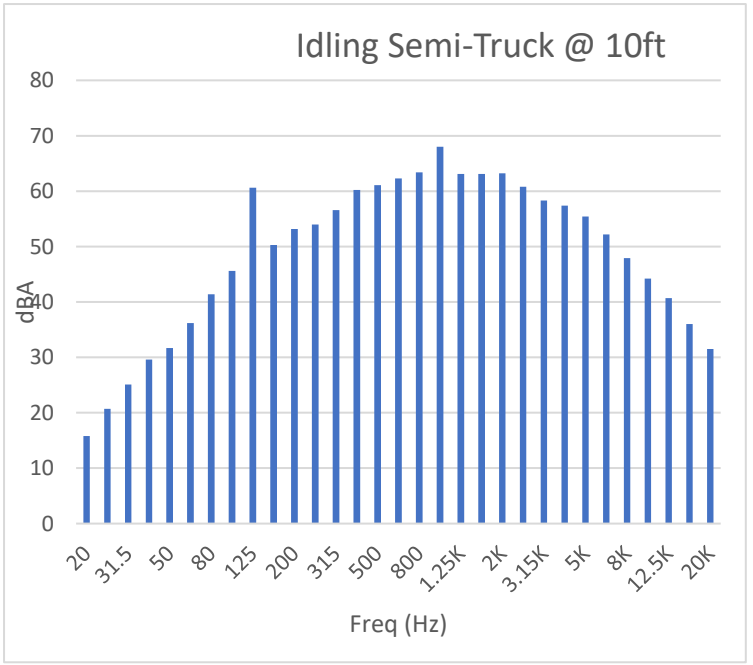
Site Observations:
Clear sky, 95 degrees, F

Location: Loading dock
Sound Meter: NTi XL2 **SN:** A2A-05967-E0
Settings: A-weighted, fast, 1-sec, 30-sec duration
Meteorological Cond.: N/A

Table 1: Summary Measurement Data

Source	System	Overall dB(A)	3rd Octave Band Data (dBA)																																
			20	25	32	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.15K	4K	5K	6.3K	8K	10K	12.5K	16K	20K
Semi-Truck Idle	Semi-Truck	73.8	16	21	25	30	32	36	41	46	61	50	53	54	57	60	61	62	63	68	63.1	63	63	61	58	57	55	52	48	44	41	36	32

Figure 1: Semi Truck



Appendix C:

SoundPlan Input/Output

Meyers Escondido Noise
Contribution spectra - Situaton 1: Outdoor SP

Source	Time slice	Sum	25Hz	31.5Hz	40Hz	50Hz	63Hz	80Hz	100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz	5kHz	6.3kHz	8kHz	10kHz
		dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
Receiver -270,116 Fl G dB(A) Leq 42.0 dB(A) Sigma(Leq) 0.0 dB(A)																													
Loading dock	Leq	38.4	-56.2	-46.3	-37.5	-31.6	-20.5	-11.6	-7.3	10.6	3.5	7.1	10.2	15.1	20.7	23.6	25.4	28.8	33.5	29.2	29.4	28.8	26.0	22.9	19.4	17.3	10.4	0.6	-10.9
Loading dock	Leq	37.2	-56.7	-46.8	-38.0	-32.2	-23.4	-12.6	-8.9	8.9	1.7	4.4	7.5	12.4	18.7	21.6	23.4	27.2	32.4	28.1	28.4	27.8	25.0	21.9	18.3	14.0	6.3	-4.0	-16.5
Loading dock	Leq	35.1	-58.8	-48.9	-40.1	-34.3	-25.5	-16.7	-11.2	6.6	-0.5	2.2	5.2	10.1	16.6	19.6	21.4	25.4	30.2	26.0	26.4	25.8	23.1	19.9	16.1	12.1	5.0	-6.6	-21.1
Parking	Leq	2.1														2.1													
Parking	Leq	1.8														1.8													
Parking	Leq	1.6														1.6													
Parking	Leq	1.5														1.5													
Parking	Leq	20.0														20.0													
Parking	Leq	18.0														18.0													
Parking	Leq	15.0														15.0													
Parking	Leq	-1.8														-1.8													
Parking	Leq	-2.3														-2.3													
Parking	Leq	24.1														24.1													
Parking	Leq	-1.1														-1.1													
Parking	Leq	10.3														10.3													
Parking	Leq	-1.8														-1.8													
Parking	Leq	-2.3														-2.3													
Parking	Leq	-3.4														-3.4													
Parking	Leq	-2.8														-2.8													
Receiver East reciever 1 Fl G dB(A) Leq 39.0 dB(A) Sigma(Leq) 0.0 dB(A)																													
Loading dock	Leq	22.6	-62.2	-53.1	-45.3	-40.5	-32.8	-25.1	-22.4	-5.6	-13.8	-10.6	-8.6	-4.7	-0.7	1.3	2.2	11.5	19.1	14.2	13.9	12.7	9.2	5.2	1.1	-4.1	-12.1	-22.4	-34.2
Loading dock	Leq	24.4	-61.0	-51.9	-44.0	-39.3	-31.6	-23.9	-20.8	-4.1	-12.4	-9.1	-7.1	-3.2	2.2	4.2	5.1	15.5	20.5	15.6	15.4	14.2	10.8	7.0	2.9	-1.8	-9.1	-18.5	-29.3
Loading dock	Leq	25.1	-60.1	-50.9	-43.0	-38.1	-30.4	-22.7	-19.6	-2.9	-11.2	-7.9	-6.0	-2.1	3.2	5.2	6.1	16.8	20.9	16.1	16.3	15.1	11.7	8.0	3.8	-0.6	-8.0	-17.1	-27.5
Parking	Leq	27.1														27.1													
Parking	Leq	32.2														32.2													
Parking	Leq	32.6														32.6													
Parking	Leq	27.3														27.3													
Parking	Leq	7.1														7.1													
Parking	Leq	7.0														7.0													
Parking	Leq	8.6														8.6													
Parking	Leq	23.2														23.2													
Parking	Leq	26.9														26.9													
Parking	Leq	13.9														13.9													
Parking	Leq	20.7														20.7													
Parking	Leq	20.9														20.9													

Meyers Escondido Noise
Contribution spectra - Situaton 1: Outdoor SP

Source	Time slice	Sum	25Hz	31.5Hz	40Hz	50Hz	63Hz	80Hz	100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz	5kHz	6.3kHz	8kHz	10kHz
		dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
Parking	Leq	20.0														20.0													
Parking	Leq	21.7														21.7													
Parking	Leq	28.0														28.0													
Parking	Leq	29.1														29.1													
Receiver North reciever 2 Fl G dB(A) Leq 42.2 dB(A) Sigma(Leq) 0.0 dB(A)																													
Loading dock	Leq	15.8	-62.3	-53.3	-45.3	-40.3	-32.3	-24.3	-21.7	-4.7	-12.8	-10.8	-8.7	-4.8	-0.4	1.6	2.5	6.4	10.5	6.7	6.9	6.3	3.4	0.2	-3.5	-8.1	-16.0	-24.1	-38.7
Loading dock	Leq	27.8	-60.1	-51.0	-43.0	-38.1	-30.2	-22.2	-19.1	-2.2	-10.2	-8.2	-6.2	-2.2	2.2	4.2	5.1	19.7	23.9	19.1	18.8	17.6	14.1	10.3	5.9	2.6	4.6	-3.4	-16.2
Loading dock	Leq	26.7	-56.0	-46.8	-38.7	-33.7	-25.8	-17.9	-14.5	2.3	-5.8	-4.1	-2.1	1.8	6.3	8.3	14.7	18.0	22.2	17.4	17.2	16.2	13.1	9.8	9.3	5.6	-2.0	-11.4	-21.5
Parking	Leq	8.2														8.2													
Parking	Leq	14.3														14.3													
Parking	Leq	22.3														22.3													
Parking	Leq	26.2														26.2													
Parking	Leq	6.0														6.0													
Parking	Leq	7.3														7.3													
Parking	Leq	16.3														16.3													
Parking	Leq	3.9														3.9													
Parking	Leq	6.0														6.0													
Parking	Leq	2.2														2.2													
Parking	Leq	2.4														2.4													
Parking	Leq	4.4														4.3													
Parking	Leq	40.7														40.7													
Parking	Leq	34.6														34.6													
Parking	Leq	23.4														23.4													
Parking	Leq	9.7														9.7													
Receiver West reciever 3 Fl G dB(A) Leq 43.3 dB(A) Sigma(Leq) 0.0 dB(A)																													
Loading dock	Leq	37.7	-56.6	-46.7	-37.9	-32.2	-23.5	-14.9	-11.0	6.4	-1.3	7.5	10.1	17.3	22.0	24.4	25.8	28.9	33.1	28.3	28.0	26.9	24.1	20.6	16.7	12.2	5.0	-4.8	-16.2
Loading dock	Leq	37.6	-53.4	-43.6	-34.8	-29.0	-20.4	-6.9	-2.7	14.7	7.1	10.8	13.2	17.4	21.6	23.8	24.9	28.0	32.9	28.6	28.2	27.0	23.8	20.4	16.9	14.0	7.0	-1.8	-11.5
Loading dock	Leq	39.7	-51.3	-41.5	-32.7	-27.0	-13.9	-5.2	-1.0	16.4	8.6	13.7	16.0	20.2	24.3	26.5	27.6	30.5	35.1	30.2	29.7	28.6	25.4	22.1	19.2	15.6	9.0	0.9	-8.1
Parking	Leq	6.1														6.1													
Parking	Leq	6.3														6.3													
Parking	Leq	6.3														6.3													
Parking	Leq	6.1														6.1													
Parking	Leq	21.7														21.7													
Parking	Leq	23.6														23.6													
Parking	Leq	24.3														24.3													
Parking	Leq	2.3														2.3													

Meyers Escondido Noise
Contribution spectra - Situaton 1: Outdoor SP

Source	Time slice	Sum	25Hz	31.5Hz	40Hz	50Hz	63Hz	80Hz	100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz	5kHz	6.3kHz	8kHz	10kHz
		dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
Parking	Leq	3.3														3.3													
Parking	Leq	15.2														15.2													
Parking	Leq	2.0														2.0													
Parking	Leq	6.0														6.0													
Parking	Leq	12.8														12.8													
Parking	Leq	7.2														7.2													
Parking	Leq	3.4														3.4													
Parking	Leq	3.6														3.6													

Meyers Escondido Noise
Contribution level - Situaton 1: Outdoor SP

Source	Source group	Source ty	Tr. lane	Leq dB(A)	A dB	
Receiver -270,116 Fl G dB(A) Leq 42.0 dB(A) Sigma(Leq) 0.0 dB(A)						
Parking	Default parking lot noise	PLot		10.3	0.0	
Parking	Default parking lot noise	PLot		-1.1	0.0	
Parking	Default parking lot noise	PLot		24.1	0.0	
Parking	Default parking lot noise	PLot		-2.3	0.0	
Parking	Default parking lot noise	PLot		-2.8	0.0	
Parking	Default parking lot noise	PLot		-3.4	0.0	
Parking	Default parking lot noise	PLot		-2.3	0.0	
Parking	Default parking lot noise	PLot		-1.8	0.0	
Parking	Default parking lot noise	PLot		1.5	0.0	
Parking	Default parking lot noise	PLot		1.6	0.0	
Parking	Default parking lot noise	PLot		1.8	0.0	
Parking	Default parking lot noise	PLot		2.1	0.0	
Parking	Default parking lot noise	PLot		-1.8	0.0	
Parking	Default parking lot noise	PLot		15.0	0.0	
Parking	Default parking lot noise	PLot		18.0	0.0	
Parking	Default parking lot noise	PLot		20.0	0.0	
Loading dock	Default industrial noise	Point		35.1	0.0	
Loading dock	Default industrial noise	Point		37.2	0.0	
Loading dock	Default industrial noise	Point		38.4	0.0	
Receiver East reciever 1 Fl G dB(A) Leq 39.0 dB(A) Sigma(Leq) 0.0 dB(A)						
Parking	Default parking lot noise	PLot		20.9	0.0	
Parking	Default parking lot noise	PLot		20.7	0.0	
Parking	Default parking lot noise	PLot		13.9	0.0	
Parking	Default parking lot noise	PLot		26.9	0.0	
Parking	Default parking lot noise	PLot		29.1	0.0	
Parking	Default parking lot noise	PLot		28.0	0.0	
Parking	Default parking lot noise	PLot		21.7	0.0	
Parking	Default parking lot noise	PLot		20.0	0.0	
Parking	Default parking lot noise	PLot		27.3	0.0	
Parking	Default parking lot noise	PLot		32.6	0.0	
Parking	Default parking lot noise	PLot		32.2	0.0	
Parking	Default parking lot noise	PLot		27.1	0.0	
Parking	Default parking lot noise	PLot		23.2	0.0	
Parking	Default parking lot noise	PLot		8.6	0.0	
Parking	Default parking lot noise	PLot		7.0	0.0	
Parking	Default parking lot noise	PLot		7.1	0.0	
Loading dock	Default industrial noise	Point		25.1	0.0	
Loading dock	Default industrial noise	Point		24.4	0.0	
Loading dock	Default industrial noise	Point		22.6	0.0	
Receiver North reciever 2 Fl G dB(A) Leq 42.2 dB(A) Sigma(Leq) 0.0 dB(A)						
Parking	Default parking lot noise	PLot		4.3	0.0	
Parking	Default parking lot noise	PLot		2.4	0.0	
Parking	Default parking lot noise	PLot		2.2	0.0	

Source	Source group	Source ty	Tr. lane	Leq dB(A)	A dB	
Parking	Default parking lot noise	PLot		6.0	0.0	
Parking	Default parking lot noise	PLot		9.7	0.0	
Parking	Default parking lot noise	PLot		23.4	0.0	
Parking	Default parking lot noise	PLot		34.6	0.0	
Parking	Default parking lot noise	PLot		40.7	0.0	
Parking	Default parking lot noise	PLot		26.2	0.0	
Parking	Default parking lot noise	PLot		22.3	0.0	
Parking	Default parking lot noise	PLot		14.3	0.0	
Parking	Default parking lot noise	PLot		8.2	0.0	
Parking	Default parking lot noise	PLot		3.9	0.0	
Parking	Default parking lot noise	PLot		16.3	0.0	
Parking	Default parking lot noise	PLot		7.3	0.0	
Parking	Default parking lot noise	PLot		6.0	0.0	
Loading dock	Default industrial noise	Point		26.7	0.0	
Loading dock	Default industrial noise	Point		27.8	0.0	
Loading dock	Default industrial noise	Point		15.8	0.0	
Receiver West reciever 3 Fl G dB(A) Leq 43.3 dB(A) Sigma(Leq) 0.0 dB(A)						
Parking	Default parking lot noise	PLot		6.0	0.0	
Parking	Default parking lot noise	PLot		2.0	0.0	
Parking	Default parking lot noise	PLot		15.2	0.0	
Parking	Default parking lot noise	PLot		3.3	0.0	
Parking	Default parking lot noise	PLot		3.6	0.0	
Parking	Default parking lot noise	PLot		3.4	0.0	
Parking	Default parking lot noise	PLot		7.2	0.0	
Parking	Default parking lot noise	PLot		12.8	0.0	
Parking	Default parking lot noise	PLot		6.1	0.0	
Parking	Default parking lot noise	PLot		6.3	0.0	
Parking	Default parking lot noise	PLot		6.3	0.0	
Parking	Default parking lot noise	PLot		6.1	0.0	
Parking	Default parking lot noise	PLot		2.3	0.0	
Parking	Default parking lot noise	PLot		24.3	0.0	
Parking	Default parking lot noise	PLot		23.6	0.0	
Parking	Default parking lot noise	PLot		21.7	0.0	
Loading dock	Default industrial noise	Point		39.7	0.0	
Loading dock	Default industrial noise	Point		37.6	0.0	
Loading dock	Default industrial noise	Point		37.7	0.0	

Meyers Escondido Noise
3rd octave spectra of the sources in dB(A) - Situaton 1: Outdoor SP

Name	l or A	Li	R'w	L'w	Lw	25Hz	31.5Hz	40Hz	50Hz	63Hz	80Hz	100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz	5kHz	6.3kHz	8kHz	10kHz
	m,m²	dB(A)	dB	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
Loading dock				85.4	85.4	-12.0	-2.0	7.0	13	22.0	31.0	38.0	56.0	49.0	54.0	57.0	62.0	67.0	70.0	72.0	75.0	80.0	76.0	76.0	76.0	74.0	72.0	70.0	68.1	64.0	59.0	54.0
Loading dock				85.4	85.4	-12.0	-2.0	7.0	13	22.0	31.0	38.0	56.0	49.0	54.0	57.0	62.0	67.0	70.0	72.0	75.0	80.0	76.0	76.0	76.0	74.0	72.0	70.0	68.1	64.0	59.0	54.0
Loading dock				85.4	85.4	-12.0	-2.0	7.0	13	22.0	31.0	38.0	56.0	49.0	54.0	57.0	62.0	67.0	70.0	72.0	75.0	80.0	76.0	76.0	76.0	74.0	72.0	70.0	68.1	64.0	59.0	54.0
Parking	111.22			55.6	76.0														76.0													
Parking	121.22			55.2	76.0														76.0													
Parking	131.02			54.9	76.0														76.0													
Parking	114.43			55.4	76.0														76.0													
Parking	184.38			56.3	79.0														79.0													
Parking	169.16			55.9	78.2														78.2													
Parking	180.83			56.4	79.0														79.0													
Parking	111.73			55.5	76.0														76.0													
Parking	136.47			54.7	76.0														76.0													
Parking	233.67			57.9	81.6														81.6													
Parking	122.10			55.2	76.0														76.0													
Parking	143.48			55.4	77.0														77.0													
Parking	130.12			55.4	76.5														76.5													
Parking	106.13			55.2	75.5														75.5													
Parking	125.88			55.0	76.0														76.0													
Parking	133.94			54.8	76.0														76.0													

Appendix D:

Traffic Noise Modeling Output

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Meyers Escondido
ROADWAY Mission Rd
SEGMENT Barham Dr to Nordahl Road
LOCATION: City of Escondido SCENARIO: Existing

JOB #: 0623-20-09
DATE: 11-Nov-20
ENGINEER: R. Pearson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	20,600
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	66
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	2,060

RECEIVER INPUT DATA

RECEIVER DISTANCE =		50
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		50
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

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

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.755	0.140	0.105	0.974
MEDIUM TRUCKS	0.489	0.022	0.489	0.018
HEAVY TRUCKS	0.473	0.054	0.473	0.007

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	37.7	- -
MEDIUM TRUCKS=	4.00	37.6	- -
HEAVY TRUCKS =	8.01	37.7	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	71.1	69.1	67.7	61.7	70.2	70.8
MEDIUM TRUCKS	62.1	58.2	50.8	59.5	65.7	65.7
HEAVY TRUCKS	62.7	58.6	55.2	59.9	66.1	66.2
VEHICULAR NOISE	72.1	69.8	68.1	65.3	72.6	**73.0**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	79	170	366	789
LDN	74	160	345	742

FHWA-RD-77-108 ROADWAY TRAFFIC NOISE PREDICTION MODEL (CNEL) - CALVENO

PROJECT: Meyers Escondido
ROADWAY Mission Rd
SEGMENT Barham Dr to Nordahl Road
LOCATION: City of Escondido SCENARIO: E+P

JOB #: 0623-20-09
DATE: 11-Nov-20
ENGINEER: R. Pearson

NOISE INPUT DATA

ROADWAY CONDITIONS

ADT =	21,680
SPEED =	45
PK HR % =	10
NEAR LANE/FAR LANE DIST =	66
ROAD ELEVATION =	0
GRADE =	0
PK HR VOL =	2,168

RECEIVER INPUT DATA

RECEIVER DISTANCE =		50
DIST C/L TO WALL =		0
RECEIVER HEIGHT =		5
WALL DISTANCE FROM RECEIVER =		50
PAD ELEVATION =		0
ROADWAY VIEW:	LF ANGLE	-90
	RT ANGLE	90
	DF ANGLE	180

SITE CONDITIONS

AUTOMOBILES	15	
MED TRUCKS	15	(HARD SITE=10, SOFT SITE=15)
HVY TRUCKS	15	

WALL INFORMATION

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

VEHICLE MIX DATA

VEHICLE TYPE	DAY	EVE	NIGHT	DAILY
AUTOMOBILES	0.755	0.140	0.105	0.974
MEDIUM TRUCKS	0.489	0.022	0.489	0.018
HEAVY TRUCKS	0.473	0.054	0.473	0.007

MISC. VEHICLE INFO

VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT
AUTOMOBILES =	2.00	37.7	- -
MEDIUM TRUCKS=	4.00	37.6	- -
HEAVY TRUCKS =	8.01	37.7	0.0

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	71.3	69.3	68.0	62.0	70.4	71.0
MEDIUM TRUCKS	62.4	58.5	51.0	59.7	65.9	65.9
HEAVY TRUCKS	62.9	58.9	55.5	60.1	66.3	66.4
VEHICULAR NOISE	72.3	70.0	68.3	65.5	72.8	**73.2**

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	82	176	379	816
LDN	77	165	357	768

City of Escondido

Primary Street	1st Cross Street	2nd Cross Street	2011	2012	2013	2014	2015
MIDWAY DR	MISSION AVE	WASHINGTON AVE	10900 N	10900	10900 N	10900 N	10900 N
MIDWAY DR	WASHINGTON AVE	VALLEY PKWY	16000 N	15500	15500 N	15500 N	15500 N
MIDWAY DR	VALLEY PKWY	GRAND AVE	15800 N	15000	15000 N	15000 N	15000 N
MIDWAY DR	GRAND AVE	OAK HILL DR	12400 N	12400	12400 N	12400 N	12400 N
MIDWAY DR	OAK HILL DR	BEAR VALLEY PKWY	10000 N	7500	7500 N	7500 N	7500 N
MISSION AVE	MISSION RD/ANDREASEN DR	ROCK SPRINGS RD	21400 N	20000	20000 N	20000 N	20000 N
MISSION AVE	ROCK SPRINGS RD	QUINCE ST	27900 N	28100	28100 N	28100 N	28100 N
MISSION AVE	QUINCE ST	CENTRE CITY PKWY	28400 N	27900	20500	20500 N	20500 N
MISSION AVE	CENTRE CITY PKWY	ESCONDIDO BLVD	24600 N	24600	19300	19300 N	19300 N
MISSION AVE	ESCONDIDO BLVD	BROADWAY	22000 N	21000	21000 N	21000 N	21000 N
MISSION AVE	BROADWAY	FIG ST	17300 N	18500	18500 N	18500 N	18500 N
MISSION AVE	FIG ST	ASH ST	14600 N	15500	15500 N	15500 N	15500 N
MISSION AVE	ASH ST	ROSE ST	10500 N	9900	9900 N	9900 N	9900 N
MISSION AVE	ROSE ST	MIDWAY DR	7600 N	9200	9200 N	9200 N	9200 N
MISSION AVE	MIDWAY DR	CITRUS AVE	4400 N	7600	7600 N	7600 N	7600 N
MISSION RD	BARHAM DR	NORDAHL RD/CITRACADO PKWY	20300 N	20600	20600 N	20600 N	20600 N
MISSION RD	NORDAHL RD/CITRACADO PKWY	MISSION AVE/ANDREASEN DR	21700 N	18900	18000	18000 N	18000 N
MORNING VIEW DR	EL NORTE PKWY	LINCOLN AVE	6000 N	8200	8200 N	8200 N	8200 N
NORDAHL RD	ROUTE 78	MISSION RD	33500 N	33500 N	33500 N	33500 N	33500 N
NORTH AVE	BROADWAY	LAURASHAWN LN	3100 N	3100	3100 N	3100 N	3100 N
NUTMEG ST	CENTRE CITY PKWY	COUNTRY CLUB LN	4200 N	4200	4200 N	4200 N	4200 N
NUTMEG ST	COUNTRY CLUB LN	EL NORTE PKWY	8000 N	7400	7400 N	7400 N	7400 N
OAK HILL DR	SAN PASQUAL VLLY RD/RT 78	ROSE ST	7500 N	9000	9000 N	9000 N	9000 N
OAK HILL DR	ROSE ST	MIDWAY DR	5200 N	5200	5200 N	5200 N	5200 N
OAK HILL DR	MIDWAY DR	BEAR VALLEY PKWY	2500 N	2500	2500 N	2500 N	2500 N
OAK HILL DR	BEAR VALLEY PKWY	CITRUS AVE	1200 N	1200 N	1200 N	1200 N	1200 N
ORANGE ST	VALLEY PKWY	2ND AVE	3800 N	3800 N	3800 N	3800 N	3800 N
ORANGE ST	5TH AVE	13TH AVE	1900 N	1900 N	1900 N	1900 N	1900 N
PENNSYLVANIA AVE	BROADWAY	HICKORY ST	3100 N	3100 N	3100 N	3100 N	3100 N
QUINCE ST	MISSION AVE	WASHINGTON AVE	7000 N	8700	8700 N	8700 N	8700 N
QUINCE ST	WASHINGTON AVE	VALLEY PKWY	9700 N	10700	10700 N	10700 N	10700 N
QUINCE ST	VALLEY PKWY	GRAND AVE	9000 N	9500	9500 N	9500 N	9500 N

N = Link not counted in that year. Previous year's count carried forward.
E = No actual count. ADT was estimated by the reporting jurisdiction.

Industrial
Trip Generation

Land Use	Size	Daily Trip Ends (ADTs)		AM Peak Hour					PM Peak Hour				
		Rate [a]	Volume	% of ADT	In:Out Split [a]	Volume			% of ADT	In:Out Split	Volume		
						In	Out	Total			In	Out	Total
Industrial	67.5 KSF	16 /KSF	**1,080**	12%	80 : 20	**104**	**26**	130	12%	20 : 80	**26**	**104**	130

Footnotes:

a. Trip Rate Source: SANDAG Brief Guide

Industrial
Trip Generation

Land Use	Size	Daily Trip Ends (ADTs)		AM Peak Hour					PM Peak Hour				
		Rate [a]	Volume	% of ADT	In:Out Split [a]	Volume			% of ADT	In:Out Split	Volume		
						In	Out	Total			In	Out	Total
Industrial	67.5 KSF	16 /KSF	**1,080**	12%	80 : 20	**104**	**26**	130	12%	20 : 80	**26**	**104**	130

Footnotes:

a. Trip Rate Source: SANDAG Brief Guide

Appendix E:

Construction Noise Modeling Output

Activity	L_{eq} at 225 feet dBA	L_{Max} at 225 feet dBA
Grading	71	72
Building Construction	71	72
Paving	69	71

Equipment Summary	Reference (dBA) 50 ft Lmax
Rock Drills	96
Jack Hammers	82
Pneumatic Tools	85
Source: MD Acoustics, Nov 2020.	80
Dozers	85
Scrappers	87
Haul Trucks	88
Cranes	82
Portable Generators	80
Rollers	80
Tractors	80
Front-End Loaders	86
Hydraulic Excavators	86
Graders	86
Air Compressors	86
Trucks	86

Grading **L_{Max} at 137 feet dBA**

Noise Level Calculation Prior to Implementation of Noise Attenuation Requirements

No.	Equipment Description	Reference (dBA) 50 ft Lmax	Quantity	Usage Factor[1]	Distance to Receptor (ft)	Ground Effect	Shielding (dBA)	Calculated (dBA) Lmax	Calculated (dBA) Leq	Energy
1	Grader	86	1	40	225	0.5	0	69.7	65.7	3707052.25
2	Dozer	85	1	40	225	0.5	0	68.7	64.7	2944616.27
3	Excavator	86	1	40	225	0.5	0	69.7	65.7	3707052.25
4	Tractor/Backhoe	80	3	40	225	0.5	0	68.4	64.5	2793508.27
							Lmax*	**72**	**Leq**	**71**
							Lw	**104**	**Lw**	**103**

Source: MD Acoustics, Nov 2020.

1- Percentage of time that a piece of equipment is operating at full power.

dBA – A-weighted Decibels

Lmax- Maximum Level

Leq- Equivalent Level

Feet	Meters	Ground Effect	No Shielding Leq dBA	1 dBA Shielding Leq dBA	2 dBA Shielding Leq dBA	3 dBA Shielding Leq dBA	4 dBA Shielding Leq dBA	5 dBA Shielding Leq dBA	6 dBA Shielding Leq dBA	7 dBA Shielding Leq dBA	8 dBA Shielding Leq dBA	9 dBA Shielding Leq dBA	10 dBA Shielding Leq dBA	11 dBA Shielding LeqdBA	12 dBA Shielding Leq dBA	13 dBA Shielding Leq dBA	14 dBA Shielding Leq dBA	15 dBA Shielding Leq dBA
50	**15.2**	**0.5**	**71**	**70**	**69**	**68**	**67**	**66**	**65**	**64**	**63**	**62**	**61**	**60**	**59**	**58**	**57**	**56**
60	18.3	0.5	69	68	67	66	65	64	63	62	61	60	59	58	57	56	55	54
70	21.3	0.5	68	67	66	65	64	63	62	61	60	59	58	57	56	55	54	53
80	24.4	0.5	66	65	64	63	62	61	60	59	58	57	56	55	54	53	52	51
90	27.4	0.5	65	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50
100	30.5	0.5	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
110	33.5	0.5	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48
120	36.6	0.5	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47
130	39.6	0.5	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46
140	42.7	0.5	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45
150	45.7	0.5	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44
160	48.8	0.5	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44
170	51.8	0.5	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43
180	54.9	0.5	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42
190	57.9	0.5	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42
200	61.0	0.5	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41
210	64.0	0.5	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41
220	67.1	0.5	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40
230	70.1	0.5	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40
240	73.1	0.5	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39
250	76.2	0.5	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39
260	79.2	0.5	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38
270	82.3	0.5	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38
280	85.3	0.5	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37
290	88.4	0.5	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37
300	91.4	0.5	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37
310	94.5	0.5	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36
320	97.5	0.5	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36
330	100.6	0.5	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36
340	103.6	0.5	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35
350	106.7	0.5	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35
360	109.7	0.5	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35
370	112.8	0.5	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34

Building Construction L_{Max} **at 137 feet dBA**

		Noise Level Calculation Prior to Implementation of Noise Attenuation Requirements								
								Calculated (dBA)		
No.	Equipment Description	Reference (dBA) 50 ft Lmax	Quantity	Usage Factor[1]	Distance to Receptor (ft)	Ground Effect	Shielding (dBA)	Lmax	Leq	Energy
1	Cranes	82	2	40	225	0.5	0	68.7	64.7	2951608.16
2	Forklift/Tractor	80	4	40	225	0.5	0	69.7	65.7	3724677.7
3	Generator	80	2	40	225	0.5	0	66.7	62.7	1862338.85
4	Tractor/Backhoe	80	4	40	225	0.5	0	69.7	65.7	3724677.7
							Lmax*	**72**	**Leq**	**71**
							Lw	**104**	**Lw**	**103**

Source: MD Acoustics, Nov 2020.

1- Percentage of time that a piece of equipment is operating at full power.

dBA – A-weighted Decibels

Lmax- Maximum Level

Leq- Equivalent Level

Feet	Meters	Ground Effect	No Shielding Leq dBA	1 dBA Shielding Leq dBA	2 dBA Shielding Leq dBA	3 dBA Shielding Leq dBA	4 dBA Shielding Leq dBA	5 dBA Shielding Leq dBA	6 dBA Shielding Leq dBA	7 dBA Shielding Leq dBA	8 dBA Shielding Leq dBA	9 dBA Shielding Leq dBA	10 dBA Shielding Leq dBA	11 dBA Shielding LeqdBA	12 dBA Shielding Leq dBA	13 dBA Shielding Leq dBA	14 dBA Shielding Leq dBA	15 dBA Shielding Leq dBA
50	**15.2**	**0.5**	**71**	**70**	**69**	**68**	**67**	**66**	**65**	**64**	**63**	**62**	**61**	**60**	**59**	**58**	**57**	**56**
60	18.3	0.5	69	68	67	66	65	64	63	62	61	60	59	58	57	56	55	54
70	21.3	0.5	67	66	65	64	63	62	61	60	59	58	57	56	55	54	53	52
80	24.4	0.5	66	65	64	63	62	61	60	59	58	57	56	55	54	53	52	51
90	27.4	0.5	65	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50
100	30.5	0.5	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48
110	33.5	0.5	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47
120	36.6	0.5	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46
130	39.6	0.5	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46
140	42.7	0.5	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45
150	45.7	0.5	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44
160	48.8	0.5	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43
170	51.8	0.5	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43
180	54.9	0.5	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42
190	57.9	0.5	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41
200	61.0	0.5	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41
210	64.0	0.5	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40
220	67.1	0.5	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40
230	70.1	0.5	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39
240	73.1	0.5	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39
250	76.2	0.5	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38
260	79.2	0.5	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38
270	82.3	0.5	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38
280	85.3	0.5	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37
290	88.4	0.5	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37
300	91.4	0.5	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36
310	94.5	0.5	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36
320	97.5	0.5	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36
330	100.6	0.5	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35
340	103.6	0.5	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35
350	106.7	0.5	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35
360	109.7	0.5	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34
370	112.8	0.5	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34

Paving L_{Max} **at 137 feet dBA**

Noise Level Calculation Prior to Implementation of Noise Attenuation Requirements

No.	Equipment Description	Reference (dBA) 50 ft Lmax	Quantity	Usage Factor[1]	Distance to Receptor (ft)	Ground Effect	Shielding (dBA)	Calculated (dBA) Lmax	Calculated (dBA) Leq	Energy
1	Pavers	86	1	40	225	0.5	0	69.7	65.7	3707052.25
2	Rollers	80	2	40	225	0.5	0	66.7	62.7	1862338.85
3	Paving Equipment	80	2	40	225	0.5	0	66.7	62.7	1862338.85
							Lmax*	**71**	**Leq**	**69**
							Lw	**103**	**Lw**	**100**

Source: MD Acoustics, Nov 2020.

1- Percentage of time that a piece of equipment is operating at full power.

dBA – A-weighted Decibels

Lmax- Maximum Level

Leq- Equivalent Level

Feet	Meters	Ground Effect	No Shielding Leq dBA	1 dBA Shielding Leq dBA	2 dBA Shielding Leq dBA	3 dBA Shielding Leq dBA	4 dBA Shielding Leq dBA	5 dBA Shielding Leq dBA	6 dBA Shielding Leq dBA	7 dBA Shielding Leq dBA	8 dBA Shielding Leq dBA	9 dBA Shielding Leq dBA	10 dBA Shielding Leq dBA	11 dBA Shielding LeqdBA	12 dBA Shielding Leq dBA	13 dBA Shielding Leq dBA	14 dBA Shielding Leq dBA	15 dBA Shielding Leq dBA
50	**15.2**	**0.5**	**69**	**68**	**67**	**66**	**65**	**64**	**63**	**62**	**61**	**60**	**59**	**58**	**57**	**56**	**55**	**54**
60	18.3	0.5	67	66	65	64	63	62	61	60	59	58	57	56	55	54	53	52
70	21.3	0.5	65	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50
80	24.4	0.5	64	63	62	61	60	59	58	57	56	55	54	53	52	51	50	49
90	27.4	0.5	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47
100	30.5	0.5	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46
110	33.5	0.5	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45
120	36.6	0.5	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44
130	39.6	0.5	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43
140	42.7	0.5	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43
150	45.7	0.5	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42
160	48.8	0.5	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41
170	51.8	0.5	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40
180	54.9	0.5	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40
190	57.9	0.5	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39
200	61.0	0.5	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39
210	64.0	0.5	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38
220	67.1	0.5	53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38
230	70.1	0.5	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37
240	73.1	0.5	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37
250	76.2	0.5	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36
260	79.2	0.5	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36
270	82.3	0.5	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35
280	85.3	0.5	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35
290	88.4	0.5	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35
300	91.4	0.5	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34
310	94.5	0.5	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34
320	97.5	0.5	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34
330	100.6	0.5	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
340	103.6	0.5	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
350	106.7	0.5	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33
360	109.7	0.5	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32
370	112.8	0.5	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32

VIBRATION LEVEL IMPACT

Project:	2351 Meyers Ave	Date: 11/10/20
Source:	Large Bulldozer	
Scenario:	Unmitigated	
Location:	Project Site	
Address:		

PPV = PPVref(25/D)^n (in/sec)

DATA INPUT

Equipment = Type	2	Large Bulldozer	INPUT SECTION IN BLUE
PPVref =	0.089	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 =	**0.073**	IN/SEC	OUTPUT IN RED