Appendix G: Noise Study

1500 S. Raymond Industrial Project

Noise Impact Study

City of Fullerton, CA

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1.0 Introduction

1.1 Purpose of Analysis and Study Objectives

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

The following is provided in this report:

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

1.2 Site Location and Study Area

The 1500 S. Raymond Industrial Project (Project) site is located in the City of Fullerton within the County of Orange; see Exhibit A. The Project site is located at 1500 Raymond Avenue. The Project site is comprised of 2 parcels which total approximately 7.22-acres. The parcel located at APN 267-031-06 north of Burton Street has an existing hotel (former Fullerton Hotel) with a restaurant, courtyard, and pool. Parcel APN 267-031-25, located north of the hotel, is paved with a parking lot, which will be utilized for the same use.

Uses surrounding the Project site include:

- North: Immediately north, bordering the Project site, are railroad tracks. Directly across the railroad tracks are developed industrial buildings within the City of Fullerton. Areas to the north are zoned Manufacturing Park (M-P).

- East: Immediately east of the Project site are developed industrial buildings within the City of Fullerton. Areas to the north are zoned Manufacturing Park (M-P).

- South: Directly south of the site is the 91 Freeway. Across the 91 freeway is residential use within the City of Anaheim.

- West: West of the Project site Raymond Ave. Directly across Raymond Ave is a developed industrial building within the City of Anaheim. Areas to the west are zoned industrial.

1.3 Proposed Project Description

The Project proposes to remove the existing on-site structures and develop a new 138,487-square foot industrial building for warehousing/distribution uses, including a 6,000-square foot mezzanine designated for office use; see Exhibit B. The building would consist of 126,419 square feet of warehouse and 12,000 square feet of office (6,000 square feet within the mezzanine and 6,000 square feet on the ground floor). Although the specific end user is not currently known, the building size and design would provide for light industrial end use; high density/distribution or uses requiring refrigeration would not occur within the site. It is anticipated that the use would operate 24 hours a day, seven days a week and be accessed by trucks during these hours. The proposed building would have a building footprint of 132,419 square feet and a maximum height of 46 feet six inches with a clear height of 32 feet within the warehouse; 16 dock-high doors would be located along the northern side of the building. A trash enclosure with roof covering would also be located along the northern side of the building.

A total of 112 automobile parking spaces would be distributed throughout the site, primarily adjacent to the proposed industrial building to the west and northwest and along the northern and northeastern perimeters of the site. The 112 parking spaces would include four standard accessible stalls, one van accessible stall, seven clean air stalls, 11 future EV charging only stalls, one future EV charging only standard accessible stall, and one future EV charging only van accessible stall. Forty trailer parking stalls would also be provided in the northeastern portion of the site.

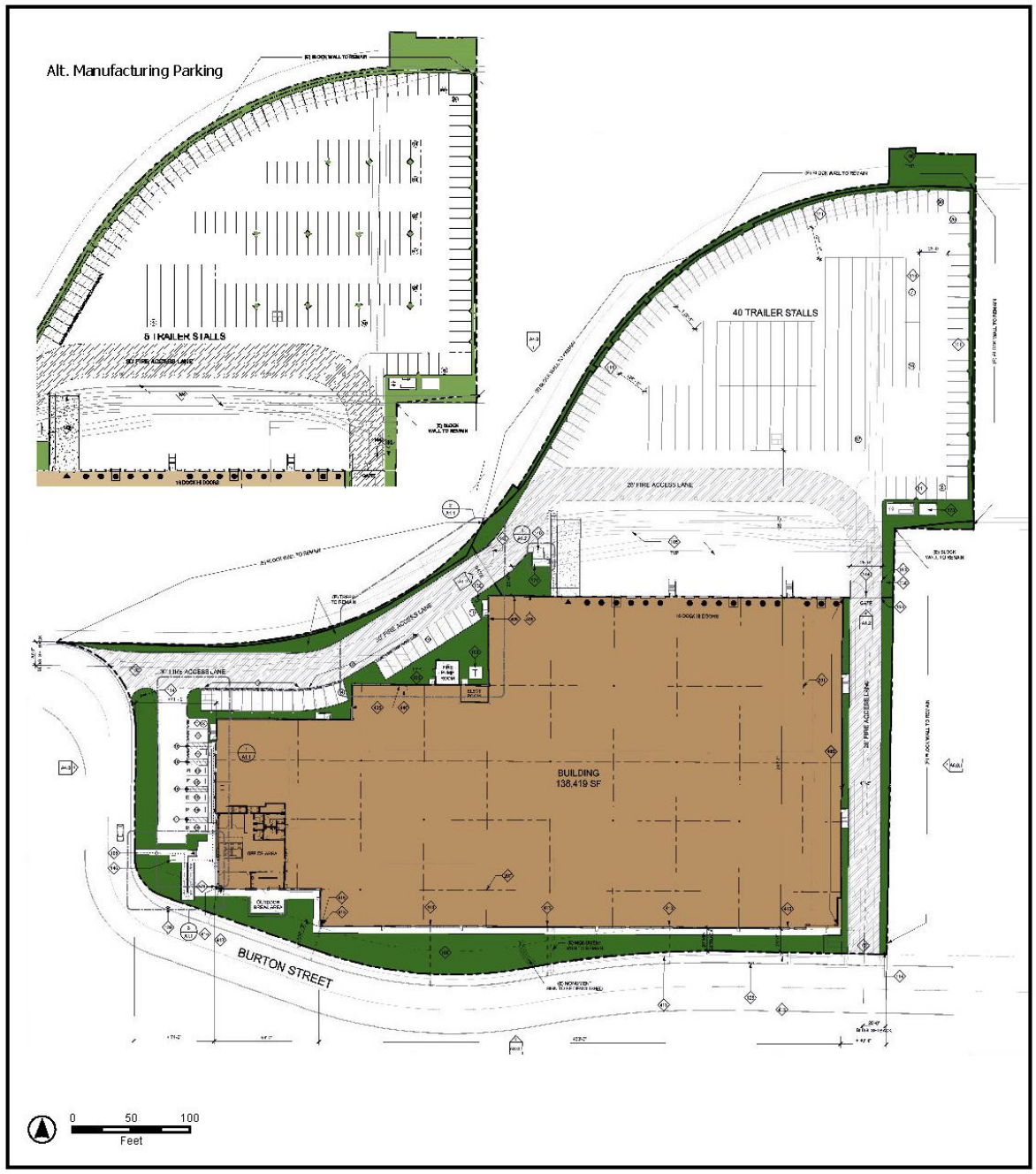
Access to the Project site would continue to occur from the two existing driveways along the westerly property line on East Burton Street and the easternmost driveway along the southerly property line on East Burton Street. The existing driveway along the southerly property line in the central portion of the site would be closed and a new curb would be constructed. Vehicles exiting the site from the western driveway on East Burton Street would be limited to right-turns only. Fire access would be provided from the driveways. From the westerly driveway a 30-foot-wide fire access lane would extend east into the site from East Burton Street and continue east/northeast along the perimeter of the Project site and then extend east within the center of the site providing access to the industrial building and loading docks to the south and parking area to the north. The fire access lane would then extend south between the industrial building and the eastern property line to the easterly driveway.

Exhibit A
Location Map



Exhibit B

Site Plan



2.0 Fundamentals of Noise

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

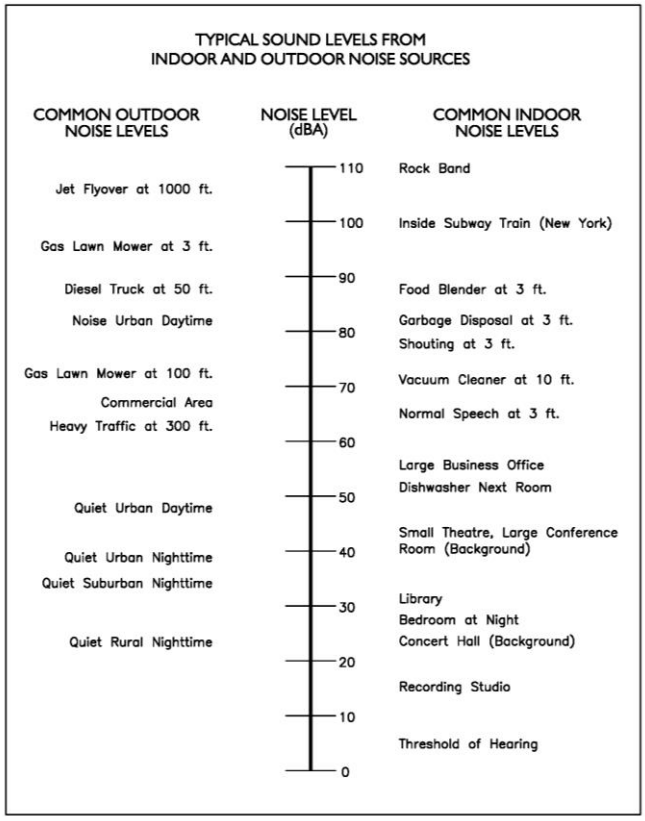
2.1 Sound, Noise, and Acoustics

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

2.2 Frequency and Hertz

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

Exhibit C: Typical A-Weighted Noise Levels



2.3 Sound Pressure Levels and Decibels

The *amplitude* of a sound determines its loudness. The loudness of sound increases or decreases as the amplitude increases or decreases. Sound pressure amplitude is measured in units of micro-Newton per square inch meter (N/m2), also called micro-Pascal (µPa). One µPa is approximately one hundred billionths (0.00000000001) 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.

2.4 Addition of Decibels

Because decibels are on a logarithmic scale, sound pressure levels cannot be added or subtracted by simple plus or minus addition. When two sounds 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.

2.5 Human Response to Changes in Noise Levels

In general, the healthy human ear is most sensitive to sounds between 1,000 Hz and 5,000 Hz, (A-weighted scale) and it perceives a sound within that range as being more intense than a sound with a higher or lower frequency with the same magnitude. For purposes of this report as well as with most environmental documents, the A-scale weighting is typically reported in terms of A-weighted decibel (dBA). Typically, the human ear can barely perceive the change in the 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.

2.6 Noise Descriptors

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

A-Weighted Sound Level: The sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighting filter de-emphasizes the very low and very high-frequency components of the sound in a manner similar to the response of the human ear. A numerical method of rating human judgment of loudness.

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

Community Noise Equivalent Level (CNEL): The average equivalent A-weighted sound level during a 24-hour day, obtained after the addition of five (5) decibels to sound levels in the evening from 7:00 to 10:00 PM and after the 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, is intense enough to damage hearing, or is otherwise annoying. The State Noise Control Act defines noise as "...excessive undesirable sound...".

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

Percent Noise Levels: See L(n).

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

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

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

2.7 Traffic Noise Prediction

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

2.8 Sound Propagation

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

versus a spherical spreading that results from a point source. The sound level attenuates for a line source at a rate of 3 dB per doubling of distance.

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

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

3.0 Ground-Bourne Vibration Fundamentals

3.1 Vibration Descriptors

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

Several different methods are used to quantify vibration amplitude.

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

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

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

3.2 Vibration Perception

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

3.3 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, to identify potential vibration impacts that may need to be studied through actual field tests.

4.0 Regulatory Setting

The proposed Project is located in the City of Fullerton and adjacent to the City of Anaheim. Noise regulations are addressed through the efforts of various federal, state, and local government agencies. The agencies responsible for regulating noise are discussed below.

4.1 Federal Regulations

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

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

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

The federal government advocates that local 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 that the developments are planned and constructed in such a manner that potential noise impacts are minimized.

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

4.2 State Regulations

Established in 1973, the California Department of Health Services Office of Noise Control (ONC) was instrumental in developing 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 the 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 and can be found in Table 8 of the City's General Plan Noise Element.

Exhibit D: Land Use Compatibility Guidelines

Table 8
Land Use Compatibility For Community Noise Environments

Land Use Category	Community Noise Exposure (CNEL)			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential-Low Density, Single-Family, Duplex, Mobile Homes	50 - 60	55 - 70	70 – 75	75 – 85
Residential – Multiple Family	50 – 65	60 – 70	70 – 75	70 – 85
Transient Lodging – Motel, Hotels	50 – 65	60 – 70	70 – 80	80 – 85
Schools, Libraries, Churches, Hospitals, Nursing Homes	50 – 70	60 – 70	70 – 80	80 – 85
Auditoriums, Concert Halls, Amphitheaters	NA	50 – 70	NA	65 – 85
Sports Arenas, Outdoor Spectator Sports	NA	50 – 75	NA	70 – 85
Playgrounds, Neighborhood Parks	50 – 70	NA	67.5 – 77.5	72.5 – 85
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50 – 70	NA	70 – 80	80 – 85
Office Buildings, Business Commercial and Professional	50 – 70	67.5 – 77.5	75 – 85	N/A
Industrial, Manufacturing, Utilities, Agriculture	50 – 75	70 – 80	75 – 85	N/A

CNEL = community noise equivalent level; NA = not applicable

NORMALLY ACCEPTABLE: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

CONDITIONALLY ACCEPTABLE: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features have been included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning, will normally suffice.

NORMALLY UNACCEPTABLE: New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise-insulation features must be included in the design.

CLEARLY UNACCEPTABLE: New construction or development should generally not be undertaken.

Source: Office of Planning and Research, California, General Plan Guidelines, October 2003.

4.3 City of Fullerton and Anaheim Noise Regulations

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

City of Fullerton General Plan

Applicable policies and standards governing environmental noise in the City are set forth in the General Plan Noise Element. Chapter 15.90 of the Fullerton Municipal Code outlines the acceptable 55 dBA 30-minute Leq limit for residential property lines. Therefore, the Project must demonstrate compliance with the City's noise standards. Noise caused by vehicular traffic on public streets is exempt.

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

Goals, Policies, and Implementation Measures

Policies, goals, and implementation program measures from the Noise Element that apply to the Project include the following:

P8.1: **Noise Reduction Measures.** Support regional and subregional efforts to implement projects or programs that abate and/or attenuate noise across jurisdictions, particularly where the source is not under the City's authority.

P8.2: **Mobile Sources.** Support projects, programs, policies and regulations to control and abate noise generated by mobile sources.

P8.3: **Consideration of Noise in Land Use Decisions.** Support projects, programs, policies and regulations which ensure noise-compatible land use planning recognizing the relative importance of noise sources in order of community impact, the local attitudes towards these sources, and the suburban or urban characteristics or the environment, while identifying noise sensitive uses.

P8.4: **Noise Reduction Measures Support**. projects, programs, policies and regulations to control and abate noise generated by stationary sources

P8.5: **Focus Area Planning Support**. projects, programs, policies and regulations to evaluate ways to ensure noise-compatible land use planning as part of community-based planning of Focus Areas.

P8.6: **Noise Receptors**. Support projects, programs, policies and regulations to permit uses where the noise level of the surroundings—after taking into account noise insulation features and other control techniques of the use—is not detrimental to the use.

P8.7: **Noise Generators.** Support projects, programs, policies and regulations to permit uses and/or activities where the noise generated by the use and/or activity is not detrimental or otherwise a nuisance to the surroundings.

City of Fullerton – Noise Ordinance

From Chapter 15.90 of the municipal code, residential zones have an exterior daytime noise limit of 55 dBA 30-minute Leq and a nighttime noise limit of 50 dBA. at residential property lines with the exemption of vehicular traffic. The code does not have limits for industrial properties.

Section 15.90.050(B) air conditioning, refrigeration, and pool equipment must be certified within the noise limits of the code.

Construction Noise Regulations

Section 15.90.050(A)(1) exempts construction noise from the hours of 7 AM to 8 PM on any day except Sunday or a City-recognized holiday.

City of Anaheim – Noise Ordinance

Section 6.70.010:

No person shall within the City create any sound radiated for extended periods from any premises which produces a sound pressure level at any point on the property line in excess of sixty decibels (Re 0.0002 Microbar) read on the A-scale of a sound level meter.

Sound created by construction or building repair of any premises within the City shall be exempt from the applications of this chapter during the hours of 7:00 a.m. to 7:00 p.m.

5.0 Study Method and Procedure

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

5.1 Noise Measurement Procedure and Criteria

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

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

MD conducted the sound level measurements in accordance with Caltrans technical noise specifications and the City's noise ordinance. All measurements 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
- Temperature and sky conditions were observed and documented

5.2 Noise Measurement Location

The noise monitoring location was selected based on the distance of the Project's proposed stationary noise sources to the nearest sensitive on-site receptors. Four (4) short-term noise measurements were conducted on the project site and represents ambient levels at the site and nearby surrounding areas. Appendix A includes photos, the field sheet, and measured noise data. Exhibit E illustrates the location of the measurements.

5.3 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 and loading docks). The model assumes that the building facility has 6 trucks loading and unloading within the same hour, four (4) rooftop HVAC units, and approximately 116 parking spaces.

Trucks idling at the loading and unloading area were modeled as point sources with a reference noise level of 74 dBA at 10 feet. Reverse beepers were modeled as point sources with a reference of 107 dBA sound power level.

Rooftop HVAC units were modeled as point sources with a reference noise level per manufacturer cut sheets. The model does not include parapets, which are anticipated and will further reduce the noise levels.

Parking was modeled as 1 car movement per parking space per hour.

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.

Finally, the model is able to evaluate the noise attenuating effects of any existing or proposed property line walls. Input and output calculations are provided in Appendix B.

Table 1: Reference Sound Level Measurements for SoundPLAN Model

Source	Source Type	Reference Level (dBA)	Descriptor
Idling Heavy Truck	Point Source	74	10 ft
Backup Beeper	Point Source	107	Sound Power
Rooftop HVAC Unit	Point Source	79-83	Sound Power
Parking	Area (SP Parking Tool)	-	1 movement per hr

5.4 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 usage factor and equipment reference levels are taken from the FHWA Construction Noise Handbook.

Construction activities would include demolition, site preparation, grading, building construction, paving, architectural coating, and landscaping.

The Project was analyzed based on the different construction phases. Construction noise is expected to be loudest during the grading phase of construction. The construction noise calculation output worksheet is located in Appendix C.

Exhibit E

Noise Measurement Location



X = Measurement location

6.0 Existing Noise Environment

Four (4) 15-minute noise measurements were conducted at the project site in order to document the existing noise environment. The measurements include the Leq, Lmin, Lmax, and other statistical data (e.g. L2, L8). The results of the noise measurement are presented in Table 2. Noise measurement field sheets are provided in Appendix A.

Table 2: Long-Term Noise Measurement Data for (LT1) (dBA)[1]

Location	Time	1-Hour dB(A)							
		L_{EQ}	L_{MAX}	L_{MIN}	L_2	L_8	L_{25}	L_{50}	L_{90}
NM-1	8:46AM-9:01AM	67.0	75.3	63.9	69.9	59.3	67.4	66.6	65.4
NM-2	9:08AM-9:23AM	57.1	64.8	53.8	60.5	58.7	57.6	56.8	55.0
NM-3	9:27AM-9:42AM	70.2	75.9	67.4	72.5	71.6	70.8	70.0	68.7
NM-4	9:44AM-9:59AM	75.5	79.2	72.9	77.4	76.7	76.0	75.4	74.3

Notes:
[1.] Short-term noise monitoring location (NM1 – NM4) is illustrated in Exhibit E.

The data presented in Table 2 and the field notes provided in Appendix A indicate that ambient noise levels in the project vicinity range between 76 and 57 dBA Leq depending on location. The field data indicates that traffic and industrial uses are the dominant noise sources.

7.0 Future Noise Environment Impacts and Mitigation

This assessment analyzes future noise impacts to and from the Project compares the results to the City's Noise Standards. The analysis details the estimated exterior noise levels associated with traffic from adjacent roadways and on-site stationary noise sources.

7.1 Future Exterior Noise

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

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

Due to the location of the proposed loading dock facilities, sensitive residential receptors that may be affected by project operational noise include the residences approximately 400 feet across the Riverside Freeway to the southeast. The worst-case stationary noise was modeled using SoundPLAN acoustical modeling software. The model utilizes SoundPLAN's sound level data for the loading docks and parking specified within Section 5.4 of this report. Loading activity constitutes the Project's maximum operational noise levels.

A total of six (6) receptor locations were modeled to evaluate the proposed Project's operational noise impact to adjacent land uses. A receptor is denoted by a yellow dot in Exhibit F.

Project Operational Noise Levels

Exhibit F shows the "project only" operational noise levels at the property lines and/or sensitive receptor areas and illustrates how the noise will propagate at the site. Worst-case operational noise levels are anticipated to range between 44 to 75 dBA Leq at the receptors R2 – R6 which does not exceed the City's 80 dBA Land Use Compatibility limits. The noise projections at R1 and R3 are below the Anaheim noise limit of 60 dBA at the property line.

Project Plus Ambient Operational Noise Levels

Table 3 demonstrates the Project plus ambient noise levels. Project plus ambient noise level projections are anticipated to range between 60 to 76 dBA Leq at the receptors R1 – R6.

<Table 3, next page>

Table 3: Worst-case Predicted Operational Noise Levels (dBA)

Receptor[1]	Existing Ambient Noise Level (dBA, Leq)[2]	Project Noise Level (dBA, Leq)[3]	Total Combined Noise Level (dBA, Leq)	Ordinance at Property Line[4]	Change in Noise Level as Result of Project
R1	67	48	67	**60**	0
R2	57	57	60	**80**	3
R3	76	44	76	**60**	0
R4	70	59	71	**80**	0
R5		75	76	**80**	6
R6	57	63	64	**80**	7

Notes:
[1] Receptor 2,4,5, and 6 represents Fullerton Industrial uses, Receptors 1 represents Anahiem Industrial use, Receptor 3 represent Anahiem single family residential..
[2] The existing ambient Leq.
[3] Project only noise level.
[4] Industrial uses in Fullerton are acceptable up to 80 dBA Leq.

In addition, Table 3 provides the anticipated change in noise level as a result of the proposed Project during daytime operable conditions.

As already demonstrated, the Project's maximum operational noise levels do not exceed Anaheim's noise limit given by the City's Municipal Code of 60 dBA Leq and the Fullerton acceptable noise limit of 80 dBA at the affected property lines.

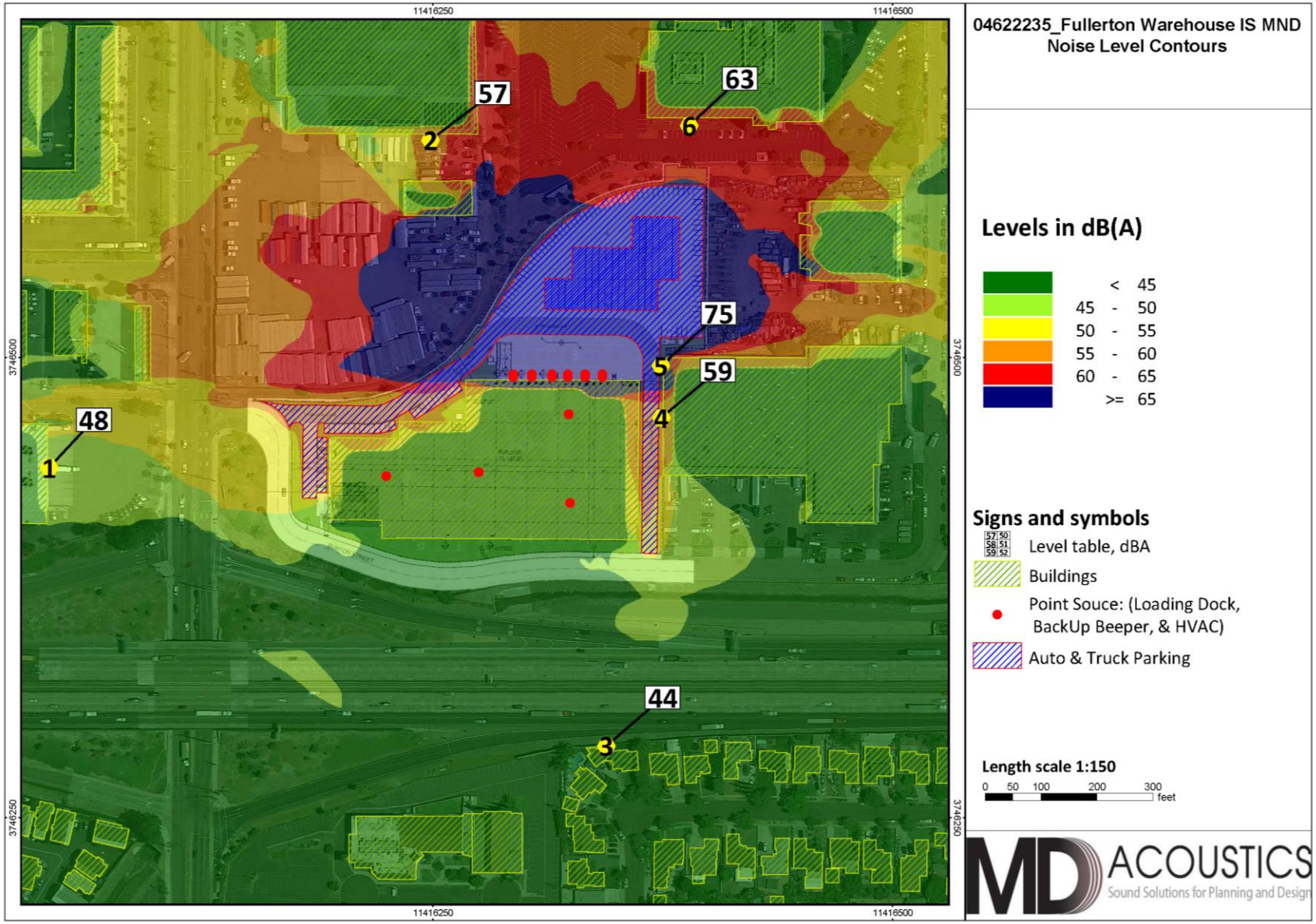
7.1.2 Noise Impacts to On/Off-Site Receptors Due to Project Generated Traffic

Per the City of Fullerton, the Project is expected to generate 85 to 90 total truck trips per day; therefore, the Project is presumed to have a less than significant impact on VMT and a traffic impact study for LOS evaluation is not required.

Traffic along the subject roadways would need to double in average daily traffic volumes to generate a 3 dBA increase in noise level. Since the Project generates a nominal amount of traffic relative to the existing ADTs, the Project's traffic noise level increase would be nominal and therefore less than significant.

Exhibit F

Operational Noise Levels



8.0 Construction Noise Impact

The degree of construction noise may vary for different areas of the project site and also vary depending on the construction activities. Noise levels associated with the construction will vary with the different phases of construction.

8.1 Construction Noise

Construction is considered a short-term impact and would be considered significant if construction activities are taken outside the allowable times of 7 AM to 8 PM as permitted by the Fullerton Municipal and 7 AM to 7 PM as permitted by the Anaheim 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. As construction is anticipated to occur within the hours of 7 AM to 7 PM, the impact is considered less than significant however construction noise level projections are provided in Appendix C.

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 the loudest during the grading phase. A likely worst-case construction noise scenario during grading assumes the use of 1-grader, 1-dozer, and 1-backhoes operating at 253 feet from the nearest receptor to the east.

Assuming a usage factor of 40 percent for each piece of equipment, unmitigated noise levels at 253 feet have the potential to reach 69 dBA L_{eq} at the property boundary during building construction.

8.2 Construction Vibration

Construction activities can produce vibration that may be felt by adjacent land uses. The construction of the proposed Project would not require the use of equipment such as pile drivers, which are known to generate substantial construction vibration levels. The primary vibration source during construction may be from a bulldozer. A large bulldozer has a vibration impact of 0.089 inches per second peak particle velocity (PPV) at 25 feet which is likely 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:

$$PPV_{equipment} = PPV_{ref} (25/D_{rec})^{n}$$

Where: PPV_{ref} = reference PPV at 25ft.
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 4 (below) provide general thresholds and guidelines as to the vibration damage potential from vibratory impacts.

Table 4: 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 5 gives approximate vibration levels for particular construction activities. This data provides a reasonable estimate for a wide range of soil conditions.

Table 5: 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.

The closest building to the site is the industrial building about 35 feet east of the site. No construction activities will take place within 35 feet of an occupied structure. At a distance of 50 feet, a large bulldozer would yield a worst-case 0.042 PPV (in/sec) which is below any risk of damage. Per Fullerton Noise Ordinance Section 15.90.050(A)(1) and Anaheim Noise Ordinance Section 6.70.010, construction staging areas along with the operation of earthmoving equipment within the city would be located as far away from vibration and noise-sensitive sites as possible. The impact is less than significant, and no mitigation is required.

8.3 Construction Best Management Practices

Per Fullerton Noise Ordinance Section 15.90.050(A)(1) and Anaheim Noise Ordinance Section 6.70.010, Construction operations will ensure through contract specifications that the following construction Best Management Practices are implemented by contractors to further reduce construction noise impact.

- Ensure that construction equipment is properly muffled according to industry standards and be in good working condition.

- Place noise-generating construction equipment and locate construction staging areas away from sensitive uses, where feasible.

- Schedule high noise-producing activities between the hours of 7:00 AM and 8:00 PM in Fullerton and 7:00 AM and 7:00 PM in Anahiem on any day except Sunday or a City-recognized holiday to minimize disruption on sensitive uses.

- Implement noise attenuation measures to the extent feasible, which may include, but are not limited to, temporary noise barriers or noise blankets around stationary construction noise sources.

- Use electric air compressors and similar power tools rather than diesel equipment, where feasible.

- Construction-related equipment, including heavy-duty equipment, motor vehicles, and portable equipment, shall be turned off when not in use for more than 5 minutes.

- Construction hours, allowable workdays, and the phone number of the job superintendent shall be clearly posted at all construction entrances to allow for surrounding owners and residents to contact the job superintendent. If the City or the job superintendent receives a complaint, the superintendent shall investigate, take appropriate corrective action, and report the action taken to the reporting party.

In addition to these Best Management Practices, heavily loaded trucks used during construction will be routed away from residential streets to the extent feasible per contract specifications per Section 15.90.050(A)(1).

9.0 References

FHWA: Highway Traffic Noise Analysis and Abatement Policy and Guidance. 1995.

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

City of Fullerton: General Plan Noise Element. 2016.

City of Fullerton: Municipal Code Chapter 9.24.

City of Fullerton: 24-Hour 2-Way Traffic Volumes. April 2016.

Caltrans: Traffic Census Program. 2020.

FHWA: Construction Noise Handbook. 2006.

Caltrans: Transportation and Construction Vibration Guidance Manual. April 2020.

FTA: Transit Noise and Vibration Impact Assessment. Sept. 2018.

Appendix A:

Field Measurement Data

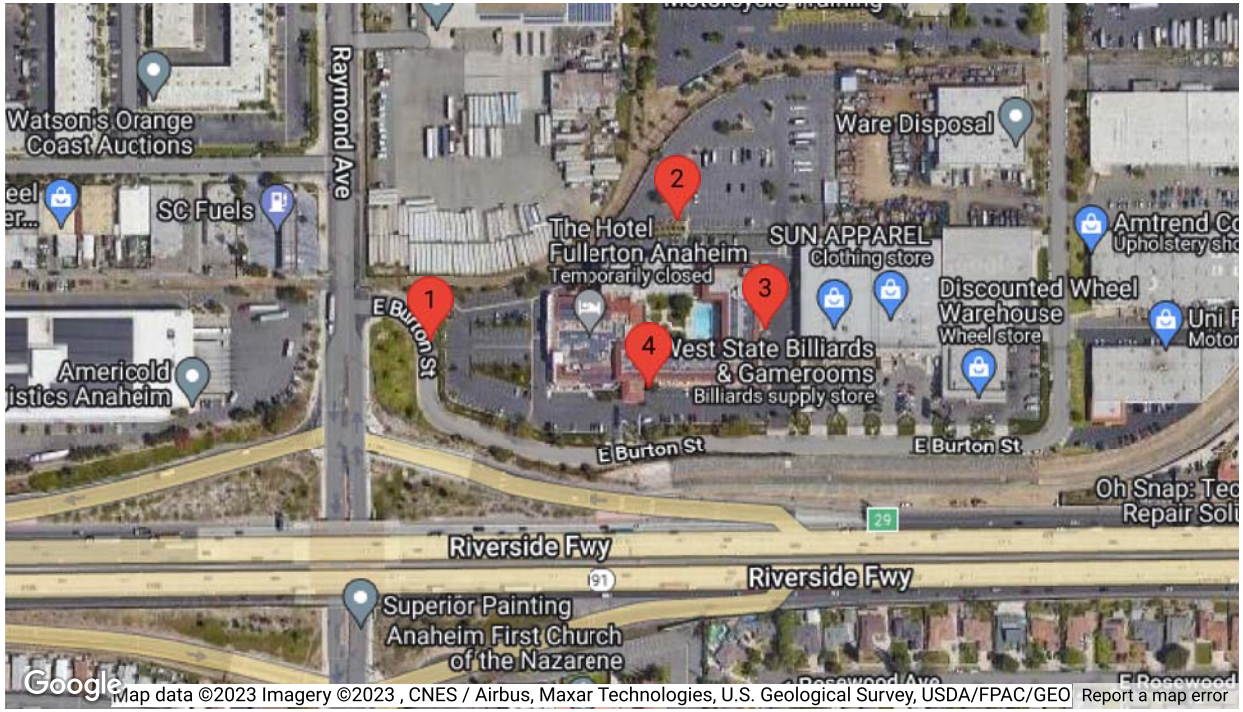
15-Minute Continuous Noise Measurement Datasheet

Project Name:	Fullerton Warehouse IS/MND
Project: #/Name:	0462-2022-035
Site Address/Location:	1500 Raymond Ave
Date:	03/03/2023
Field Tech/Engineer:	Jason Schuyler / Robert Pearson

Site Observations:

Sunny Temps in the mid to high 50's. No wind, clear skys.

Sound Meter:	XL2, NTI	**SN:**	A2A-08562-E0
Settings:	A-weighted, slow, 1-sec, 15-minute interval		
Site Id:	NM1, NM2, NM3, NM4		



MD ACOUSTICS

15-Minute Continuous Noise Measurement Datasheet - Cont.

Project Name: Fullerton Warehouse IS/MND

Site Address/Location: 1500 Raymond Ave

Site Id: NM1, NM2, NM3, NM4

Figure 1: NM1



Figure 2: NM2



Figure 3: NM3



15-Minute Continuous Noise Measurement Datasheet - Cont.

Project Name: Fullerton Warehouse IS/MND

Site Address/Location: 1500 Raymond Ave

Site Id: NM1, NM2, NM3, NM4

Figure 4: NM4



15-Minute Continuous Noise Measurement Datasheet - Cont.

Project Name: Fullerton Warehouse IS/MND

Site Address/Location: 1500 Raymond Ave

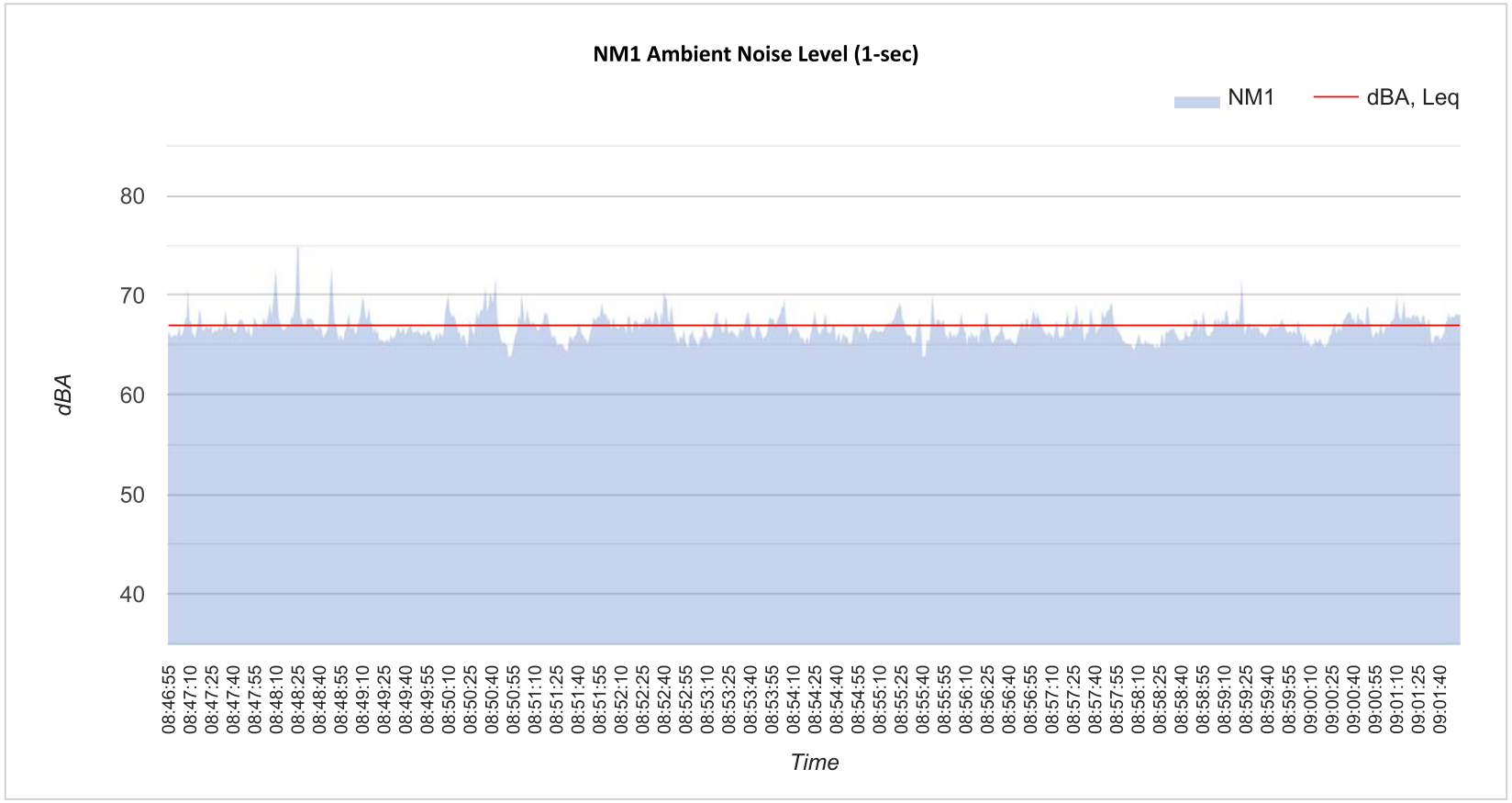
Site Id: NM1, NM2, NM3, NM4

Table 1: Baseline Noise Measurement Summary

Location	Start	Stop	Leq	Lmax	Lmin	L2	L8	L25	L50	L90
NM1	8:46 AM	9:01 AM	67	75.3	63.9	69.9	68.3	67.4	66.6	65.4
NM2	9:08 AM	9:23 AM	57.1	64.8	53.8	60.5	58.7	57.6	56.8	55
NM3	9:27 AM	9:42 AM	70.2	75.9	67.4	72.5	71.6	70.8	70	68.7
NM4	9:44 AM	9:59 AM	75.5	79.2	72.9	77.4	76.7	76	75.4	74.3

15-Minute Continuous Noise Measurement Datasheet - Cont.

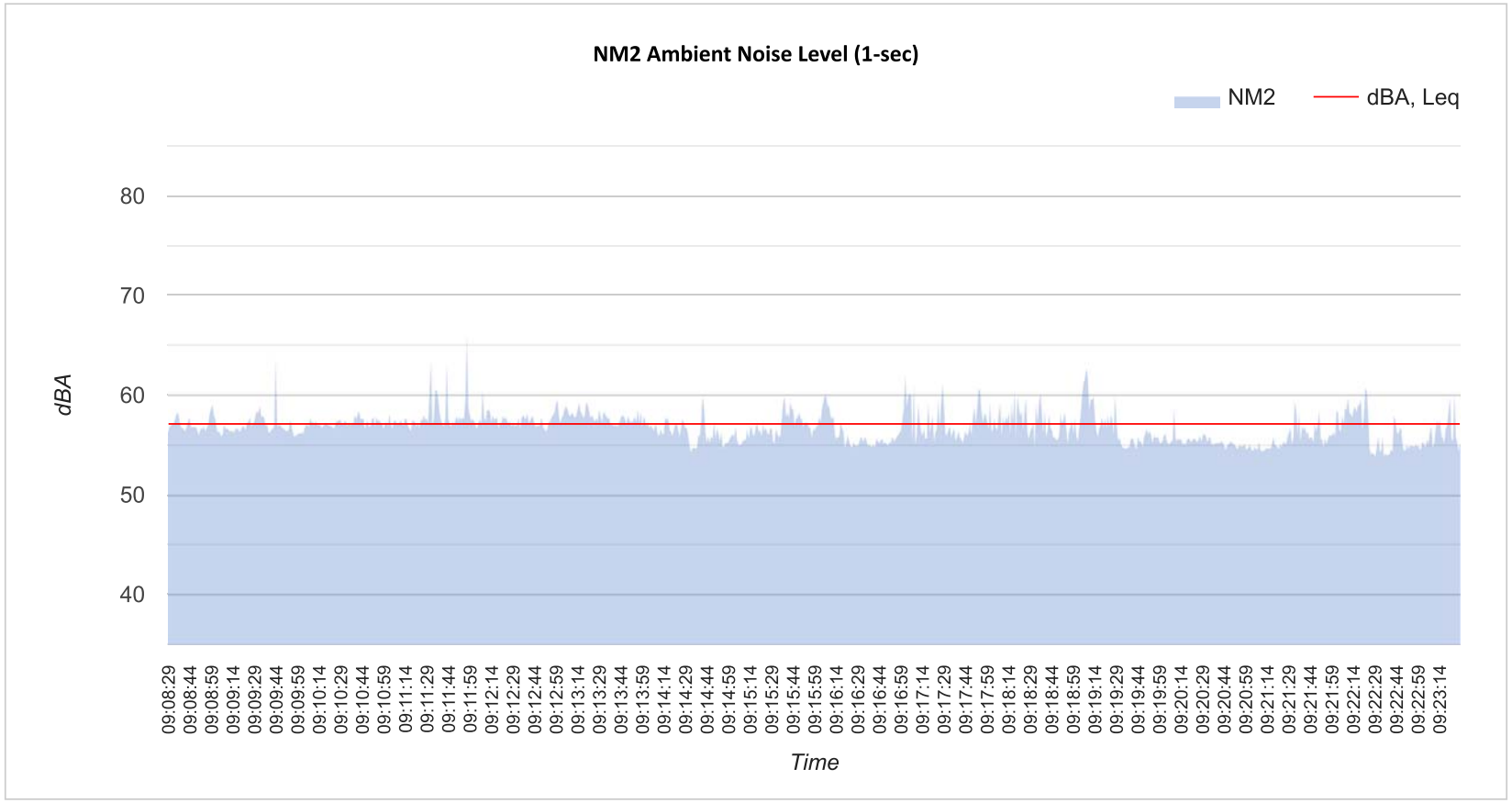
Project Name:	Fullerton Warehouse IS/MND	**Site Topo:**	On side of 91 E. Flat site	**Noise Source(s) w/ Distance:**	
Site Address/Location:	1500 Raymond Ave	**Meteorological Cond.:**	56F and Sunny NO wind	Road Noise	
Site Id:	NM1	**Ground Type:**	buildings and asphalt		



MD ACOUSTICS

15-Minute Continuous Noise Measurement Datasheet - Cont.

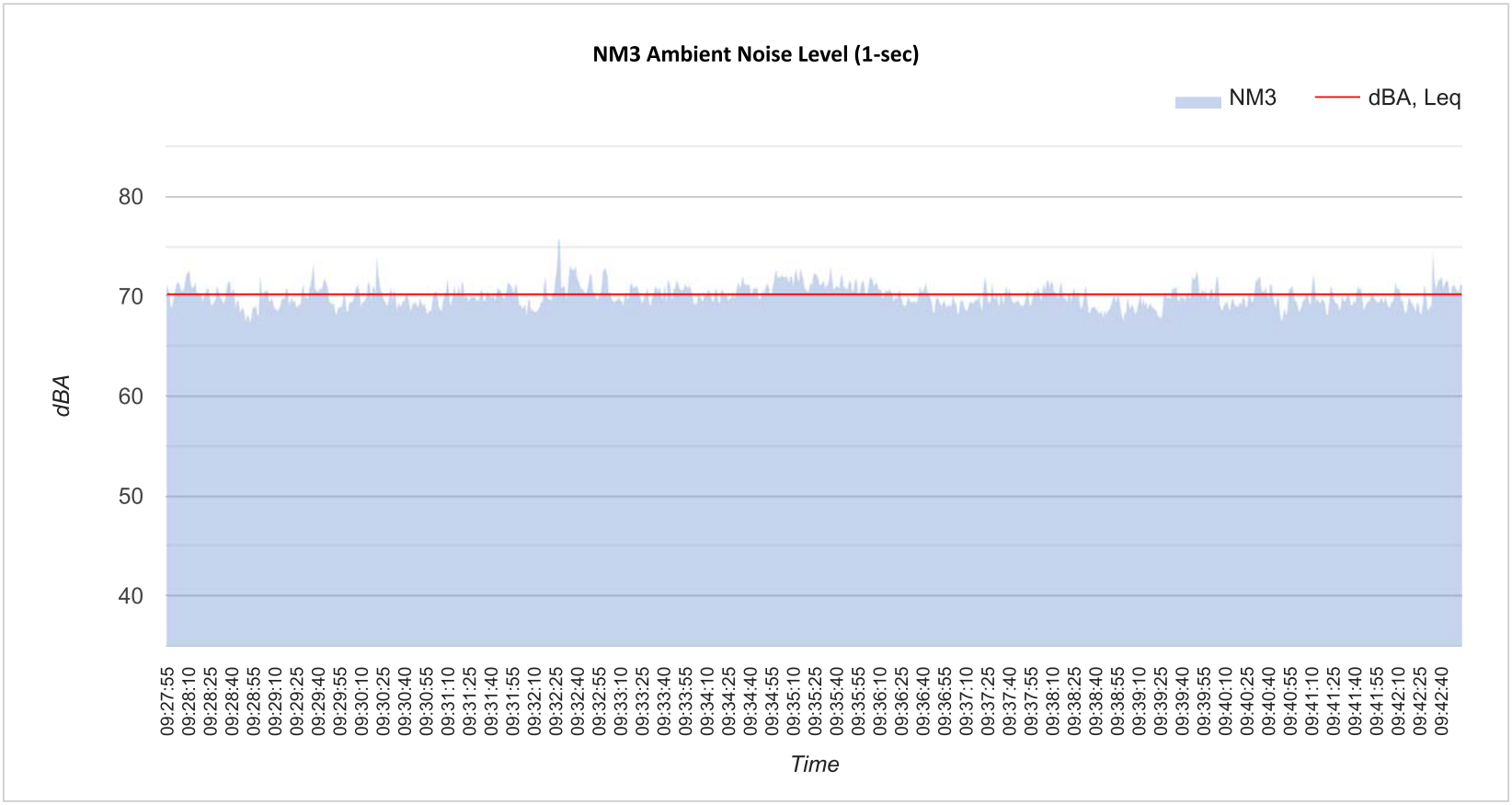
Project Name:	Fullerton Warehouse IS/MND	**Site Topo:**	Buildings; site is flat land	**Noise Source(s) w/ Distance:**	
Site Address/Location:	1500 Raymond Ave	**Meteorological Cond.:**	56F and Sunny NO wind	Road Noise	
Site Id:	NM2	**Ground Type:**	buildings and asphalt		



MD ACOUSTICS

15-Minute Continuous Noise Measurement Datasheet - Cont.

Project Name:	Fullerton Warehouse IS/MND	**Site Topo:**	Buildings 1-2 stories tall	**Noise Source(s) w/ Distance:**	
Site Address/Location:	1500 Raymond Ave	**Meteorological Cond.:**	56F and Sunny	Road Noise	
Site Id:	NM3	**Ground Type:**	buildings and asphalt		



MD ACOUSTICS

Appendix B:

SoundPLAN Input and Output



3000 SERIES
ACCURATE & RELIABLE



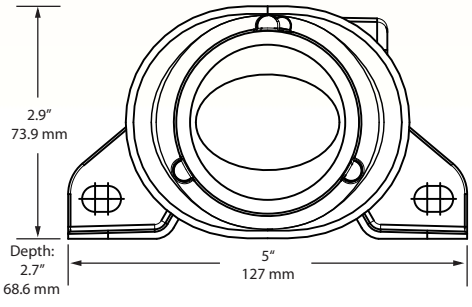
Model: 3002

The 3000 Series Alarm from Preco brings reliability and accuracy to a compact form for the first time. The 3000 Series alarm exceeds industry standards and provides you with an accurate back-up alarm that produces an audible warning that is +/- 2 dB, far superior to the +/- 4 dB of competitors and SAE requirements.

Vehicle Life Warranty

Decibels	Model	Sound Level	Voltage	Connection	SAE
97 & 107	3002	Manual Adjust	12-36 VDC	Wire Leads	B, C

The 3000 Series alarms utilize reverse mounted speaker technology to increase output while maintaining ruggedness and a small size. At only 5" x 2.9" and switchable between 97 and 107 dB, this alarm is extremely flexible and suitable for a large selection of vehicles and equipment. The added durability of a reverse mounted speaker and epoxy sealed electronics make this a great choice for many fleet types. This 3000 Series comes with 18 gauge wires that are 12" (300mm) nominal in length. Factory set to 97 dB, switchable volume levels are accomplished by connecting the grounding leads together to switch to the 107 dB level. Vehicle Life Warranty.



Adjustable Sound Levels

3002	Manually Adjustable	97 and 107 decibels	12-36 volt systems	SAE J994 Type B, C	'e' CE

Project:	Nance and Arrow Warehouse
Job Number:	0551-2020-16
Site Address/Location:	170 S William Dillard Dr, Ste A105, Gilbert, AZ 85233
Date:	08/11/2020
Field Tech/Engineer:	Shon Baldwin
Source/System:	Idling Semi-Truck
General Location:	Loading Docks - 10ft from source
Sound Meter:	NTi XL2 **SN:** A2A-05967-E0
Settings:	A-weighted, slow, 1-sec, 30-sec duration
Meteorological Cond.:	95 degrees F, no wind

Site Observations:

SLM was placed 10-ft from idiling semi-truck

Leq	Lmin	Lmax
73.8	73.0	74.9

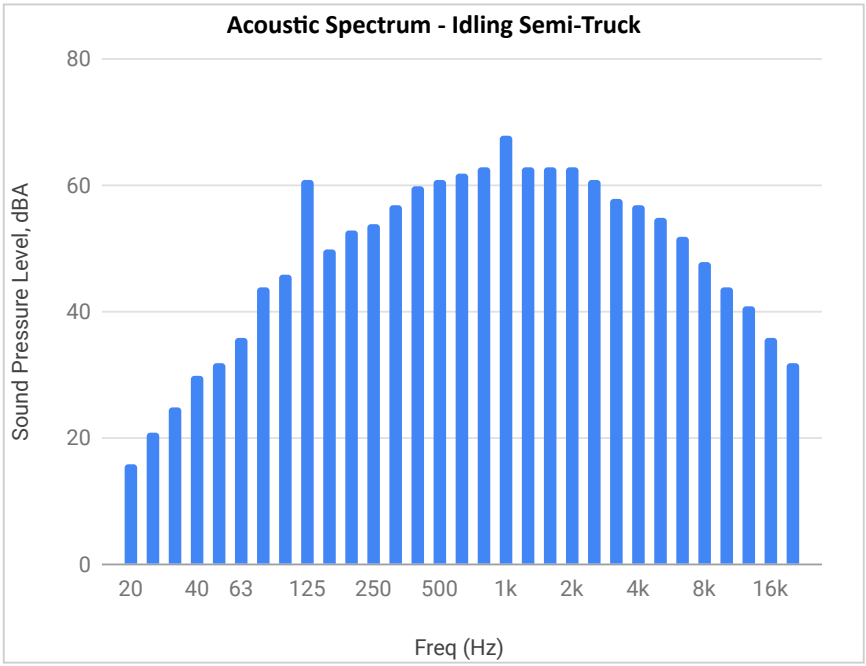
Ln 2	Ln 8	Ln 25	Ln 50	Ln 90	Ln 99
74.2	74.1	73.9	73.8	73.5	73.4

Table 1: Summary Measurement Data

Source/System	Overall Source	Overall dB(A)	3rd Octave Band Data (dBA)																														
			20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1k	12.5	1.6k	2k	2.5k	3.15	4k	5k	6.3k	8k	10k	12.5	16k	20k
Idling Semi-Truck	Semi-Truck	73.8	16.0	21.0	25.0	30.0	32.0	36.0	44.0	46.0	61.0	50.0	53.0	54.0	57.0	60.0	61.0	62.0	63.0	68.0	63.0	63.0	63.0	61.0	58.0	57.0	55.0	52.0	48.0	44.0	41.0	36.0	32.0

Figure 1: Idling Semi-Truck





Capacity ratings

AHRI RATINGS

COOLING MODE

50GCQ	NOM. CAPACITY (tons)	NET COOLING CAPACITY (Btuh)	TOTAL POWER (kW)	SEER	EER
M04	3	35,000	2.8	16.2	12.5
M05	4	47,500	3.9	16.2	12.2
M06	5	60,000	4.9	16.2	12.2

HEATING MODE

50GCQ	HSPF	HIGH HEATING CAPACITY (Btuh)	HIGH HEAT COP	LOW HEATING CAPACITY (Btuh)	LOW HEAT COP
M04	8.3	34,000	3.8	17,600	2.4
M05	8.3	45,500	3.7	24,400	2.3
M06	8.3	55,500	3.9	30,000	2.4

LEGEND

AHRI — Air Conditioning, Heating and Refrigeration Institute
ASHRAE — American Society of Heating, Refrigerating and Air Conditioning Engineers
COP — Coefficient of Performance
EER — Energy Efficiency Ratio
HSPF — Heating Seasonal Performance Factor
SEER — Seasonal Energy Efficiency Ratio

NOTES:

1. Rated and certified under AHRI Standard 210/240.
2. Ratings are based on:
   Cooling Standard: 80°F (27°C) db, 67°F (19°C) wb indoor air temperature and 95°F (35°C) db outdoor air temperature.
   High Temperature Heating Ratings: 47°F (8°C) db, 43°F (6°C) wb outdoor air temperature and 70°F (21°C) entering indoor coil air.
   Low Temperature Heating Ratings: 17°F (–8°C) db, 15°F (–9°C) wb outdoor air temperature and 70°F (21°C) entering indoor coil air.
3. All 50GCQ units comply with ASHRAE 90.1 Energy Standard for minimum SEER and EER requirements.

SOUND RATINGS TABLE

50GCQ UNIT	COOLING STAGES	OUTDOOR SOUND (dB) AT 60 Hz								
		A-WEIGHTED	63	125	250	500	1000	2000	4000	8000
M04	2	75.4	81.8	81.8	77.0	72.6	69.9	64.6	59.3	55.6
M05	2	79.0	85.6	84.7	80.5	76.0	72.4	68.0	62.8	59.3
M06	2	79.0	85.6	84.7	80.5	76.0	72.4	68.0	62.8	59.3

LEGEND

dB — Decibel

NOTES:

1. Outdoor sound data is measured in accordance with AHRI.
2. Measurements are expressed in terms of sound power. Do not compare these values to sound pressure values because sound pressure depends on specific environmental factors which normally do not match individual applications. Sound power values are independent of the environment and therefore more accurate.
3. A-weighted sound ratings filter out very high and very low frequencies, to better approximate the response of “average” human ear. A-weighted measurements for Carrier units are taken in accordance with AHRI.

MINIMUM - MAXIMUM AIRFLOW RATINGS (CFM) — COOLING UNITS AND ACCESSORY ELECTRIC HEAT

UNIT	COOLING				ELECTRIC HEAT*	
	MINIMUM AIRFLOW CFM	MINIMUM 2-SPEED AIRFLOW (LOW SPEED)	MINIMUM 2-SPEED AIRFLOW (HIGH SPEED)	MAXIMUM AIRFLOW CFM	MINIMUM AIRFLOW CFM	MAXIMUM ARIFLOW CFM
50GCQM04	900	675	900	1500	900	1500
50GCQM05	1200	900	1200	2000	1200	2000
50GCQM06	1500	1125	1500	2500	1500	2500

* Electric heat modules are available as both factory-installed options or field-installed accessories for 50GCQ units.

MINIMUM - MAXIMUM AIRFLOWS (CFM) COOLING AND ELECTRIC HEAT

UNIT	COOLING			ELECTRIC HEATERS		
	Minimum CFM	Minimum CFM 2-Speed Fan Motor (at High Speed)	Minimum CFM 2-Speed Fan Motor (at Low Speed)	Maximum CFM	Minimum CFM	Maximum CFM
50HCQA04	900	N/A	N/A	1500	900	1500
50HCQA05	1200	N/A	N/A	2000	1200	2000
50HCQA06	1500	N/A	N/A	2500	1500	2500
50HCQA07	1800	N/A	N/A	3000	1800	3000
50HCQD07	1800	1800	1200	3000	1800	3000
50HCQD08	2250	2250	1500	3750	2250*	3750
50HCQD09	2550	2873	1915	4250	2252*	4250
50HCQD12	3000	3380	2253	5000	3000*	5000

* Minimum electric heat CFM exceptions:

UNIT	UNIT VOLTAGE	HEATER kW	UNIT CONFIGURATION	REQUIRED MINIMUM CFM
50HCQD08 50HCQD09	575	17.0	Horizontal or Vertical	2800
		34.0		2350
50HCQD12	230	50.0	Vertical	3550
		50.0	Horizontal	3420
		43.5	Horizontal or Vertical	3040
	575	50.0	Vertical	3150
		33.5	Vertical	3520
		33.5	Horizontal	3420
		26.5	Vertical	3610

SOUND PERFORMANCE

50HCQ UNIT	OUTDOOR SOUND (dB) AT 60 Hz								
	A-Weighted	63	125	250	500	1000	2000	4000	8000
A04	76	51.8	69.0	64.6	67.8	70.7	63.8	60.9	59.0
A05	79	56.1	69.6	68.7	72.5	72.8	68.9	65.0	61.2
A06	79	57.7	66.6	68.7	72.9	74.5	71.1	67.6	62.6
A07	81	86.7	82.7	79.1	78.4	75.4	71.2	67.8	62.9
D07	81	86.7	82.7	79.1	78.4	75.4	71.2	67.8	62.9
D08	83	87.3	81.6	79.7	80.6	79.0	73.5	69.2	66.1
D09	87	61.7	74.7	77.4	82.6	84.9	81.9	78.8	75.9
D12	83	61.0	67.3	75.1	77.7	78.1	75.5	71.2	66.7

LEGEND

dB —Decibel

NOTES:

1. Outdoor sound data is measure in accordance with AHRI standard 270.
2. Measurements are expressed in terms of sound power. Do not compare these values to sound pressure values because sound pressure depends on specific environmental factors which normally do not match individual applications. Sound power values are independent of the environment and therefore more accurate.
3. A-weighted sound ratings filter out very high and very low frequencies, to better approximate the response of “average” human ear. A-weighted measurements for Carrier units are taken in accordance with AHRI standard 270.

Fullerton Warehouse IS MND
Octave spectra of the sources in dB(A) - 001 - Fullerton Warehouse: Outdoor SP

Name	Source type	l or A	Li	R'w	L'w	Lw	KI	KT	LwMax	DO-Wall	Time histogram	Emission spectrum	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	16kHz
		m,m²	dB(A)	dB	dB(A)	dB(A)	dB	dB	dB(A)	dB			dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)
Auto Parking	PLot	10515.31			52.8	93.0	0.0	0.0		0	100%/24h	Typical spectrum	76.4	88.0	80.5	85.0	85.1	85.5	82.8	76.6	63.8
Truck Parking	PLot	2465.88			65.4	99.3	0.0	0.0		0	100%/24h	Idling Semi Truck 10' - Calibrated	66.8	86.1	84.8	91.4	96.0	92.7	87.6	79.2	66.5
Back Up Beeper	Point				107.0	107.0	0.0	0.0		0	100%/24h	Back up Beeper	92.1	88.1	88.1	96.8	94.5	105.9	90.0	82.4	68.1
Back Up Beeper	Point				107.0	107.0	0.0	0.0		0	100%/24h	Back up Beeper	92.1	88.1	88.1	96.8	94.5	105.9	90.0	82.4	68.1
Back Up Beeper	Point				107.0	107.0	0.0	0.0		0	100%/24h	Back up Beeper	92.1	88.1	88.1	96.8	94.5	105.9	90.0	82.4	68.1
Back Up Beeper	Point				107.0	107.0	0.0	0.0		0	100%/24h	Back up Beeper	92.1	88.1	88.1	96.8	94.5	105.9	90.0	82.4	68.1
Back Up Beeper	Point				107.0	107.0	0.0	0.0		0	100%/24h	Back up Beeper	92.1	88.1	88.1	96.8	94.5	105.9	90.0	82.4	68.1
Back Up Beeper	Point				107.0	107.0	0.0	0.0		0	100%/24h	Back up Beeper	92.1	88.1	88.1	96.8	94.5	105.9	90.0	82.4	68.1
HVAC	Point				79.0	79.0	0.0	0.0		0	100%/24h	HVAC: 67.7dB @ 3ft - Carrier 50TFQ0006 -	56.1	64.6	67.0	71.3	73.6	73.2	70.2	65.3	53.0
HVAC	Point				79.0	79.0	0.0	0.0		0	100%/24h	HVAC: 67.7dB @ 3ft - Carrier 50TFQ0006 -	56.1	64.6	67.0	71.3	73.6	73.2	70.2	65.3	53.0
HVAC	Point				79.0	79.0	0.0	0.0		0	100%/24h	HVAC: 67.7dB @ 3ft - Carrier 50TFQ0006 -	56.1	64.6	67.0	71.3	73.6	73.2	70.2	65.3	53.0
HVAC	Point				79.0	79.0	0.0	0.0		0	100%/24h	HVAC: 67.7dB @ 3ft - Carrier 50TFQ0006 -	56.1	64.6	67.0	71.3	73.6	73.2	70.2	65.3	53.0
Idling Truck	Point				90.7	90.7	0.0	0.0		0	100%/24h	Idling Semi Truck 10' - Calibrated	58.2	77.5	76.2	82.8	87.4	84.1	79.0	70.6	57.9
Idling Truck	Point				90.7	90.7	0.0	0.0		0	100%/24h	Idling Semi Truck 10' - Calibrated	58.2	77.5	76.2	82.8	87.4	84.1	79.0	70.6	57.9
Idling Truck	Point				90.7	90.7	0.0	0.0		0	100%/24h	Idling Semi Truck 10' - Calibrated	58.2	77.5	76.2	82.8	87.4	84.1	79.0	70.6	57.9
Idling Truck	Point				90.7	90.7	0.0	0.0		0	100%/24h	Idling Semi Truck 10' - Calibrated	58.2	77.5	76.2	82.8	87.4	84.1	79.0	70.6	57.9
Idling Truck	Point				90.7	90.7	0.0	0.0		0	100%/24h	Idling Semi Truck 10' - Calibrated	58.2	77.5	76.2	82.8	87.4	84.1	79.0	70.6	57.9
Idling Truck	Point				90.7	90.7	0.0	0.0		0	100%/24h	Idling Semi Truck 10' - Calibrated	58.2	77.5	76.2	82.8	87.4	84.1	79.0	70.6	57.9

Source group	Source ty	Tr. lane	Leq,d dB(A)	A dB	
Receiver 11416041,3746440 Fl G Lr,lim dB(A) Leq,d 48.4 dB(A)					
Default parking lot noise	PLot		32.7	0.0	
Default industrial noise	Point		22.3	0.0	
Default industrial noise	Point		21.6	0.0	
Default industrial noise	Point		21.1	0.0	
Default industrial noise	Point		21.2	0.0	
Default industrial noise	Point		22.3	0.0	
Default industrial noise	Point		22.1	0.0	
Default industrial noise	Point		40.9	0.0	
Default industrial noise	Point		40.1	0.0	
Default industrial noise	Point		39.6	0.0	
Default industrial noise	Point		39.5	0.0	
Default industrial noise	Point		40.3	0.0	
Default industrial noise	Point		40.8	0.0	
Default parking lot noise	PLot		35.1	0.0	
Default industrial noise	Point		16.0	0.0	
Default industrial noise	Point		15.6	0.0	
Default industrial noise	Point		19.7	0.0	
Default industrial noise	Point		17.4	0.0	
Receiver 11416249,3746618 Fl G Lr,lim dB(A) Leq,d 57.2 dB(A)					
Default parking lot noise	PLot		38.0	0.0	
Default industrial noise	Point		26.4	0.0	
Default industrial noise	Point		31.8	0.0	
Default industrial noise	Point		33.2	0.0	
Default industrial noise	Point		32.6	0.0	
Default industrial noise	Point		31.7	0.0	
Default industrial noise	Point		30.3	0.0	
Default industrial noise	Point		41.6	0.0	
Default industrial noise	Point		49.7	0.0	
Default industrial noise	Point		51.2	0.0	
Default industrial noise	Point		50.3	0.0	
Default industrial noise	Point		48.4	0.0	
Default industrial noise	Point		46.9	0.0	
Default parking lot noise	PLot		46.1	0.0	
Default industrial noise	Point		17.6	0.0	
Default industrial noise	Point		14.6	0.0	
Default industrial noise	Point		13.0	0.0	
Default industrial noise	Point		11.4	0.0	
Receiver 11416344,3746289 Fl G Lr,lim dB(A) Leq,d 44.0 dB(A)					
Default parking lot noise	PLot		32.0	0.0	
Default industrial noise	Point		15.9	0.0	
Default industrial noise	Point		16.1	0.0	
Default industrial noise	Point		16.4	0.0	
Default industrial noise	Point		16.8	0.0	

Source group	Source ty	Tr. lane	Leq,d dB(A)	A dB	
Default industrial noise	Point		16.9	0.0	
Default industrial noise	Point		16.5	0.0	
Default industrial noise	Point		33.8	0.0	
Default industrial noise	Point		34.0	0.0	
Default industrial noise	Point		34.2	0.0	
Default industrial noise	Point		34.6	0.0	
Default industrial noise	Point		34.7	0.0	
Default industrial noise	Point		34.3	0.0	
Default parking lot noise	PLot		38.3	0.0	
Default industrial noise	Point		19.7	0.0	
Default industrial noise	Point		24.2	0.0	
Default industrial noise	Point		19.5	0.0	
Default industrial noise	Point		20.9	0.0	
Receiver 11416374,3746467 Fl G Lr,lim dB(A) Leq,d 58.7 dB(A)					
Default parking lot noise	PLot		52.8	0.0	
Default industrial noise	Point		27.4	0.0	
Default industrial noise	Point		28.4	0.0	
Default industrial noise	Point		29.4	0.0	
Default industrial noise	Point		30.7	0.0	
Default industrial noise	Point		32.0	0.0	
Default industrial noise	Point		33.4	0.0	
Default industrial noise	Point		44.8	0.0	
Default industrial noise	Point		45.8	0.0	
Default industrial noise	Point		46.9	0.0	
Default industrial noise	Point		48.2	0.0	
Default industrial noise	Point		49.6	0.0	
Default industrial noise	Point		51.0	0.0	
Default parking lot noise	PLot		51.6	0.0	
Default industrial noise	Point		29.2	0.0	
Default industrial noise	Point		27.8	0.0	
Default industrial noise	Point		19.7	0.0	
Default industrial noise	Point		23.0	0.0	
Receiver 11416374,3746496 Fl G Lr,lim dB(A) Leq,d 75.3 dB(A)					
Default parking lot noise	PLot		53.4	0.0	
Default industrial noise	Point		45.7	0.0	
Default industrial noise	Point		47.1	0.0	
Default industrial noise	Point		48.7	0.0	
Default industrial noise	Point		50.2	0.0	
Default industrial noise	Point		52.1	0.0	
Default industrial noise	Point		54.4	0.0	
Default industrial noise	Point		62.5	0.0	
Default industrial noise	Point		63.8	0.0	
Default industrial noise	Point		65.4	0.0	
Default industrial noise	Point		66.8	0.0	

Source group	Source ty	Tr. lane	Leq,d dB(A)	A dB	
Default industrial noise	Point		68.8	0.0	
Default industrial noise	Point		71.0	0.0	
Default parking lot noise	PLot		54.9	0.0	
Default industrial noise	Point		27.1	0.0	
Default industrial noise	Point		25.8	0.0	
Default industrial noise	Point		18.1	0.0	
Default industrial noise	Point		19.9	0.0	
Receiver 11416389,3746626 Fl G Lr,lim dB(A) Leq,d 63.1 dB(A)					
Default parking lot noise	PLot		43.7	0.0	
Default industrial noise	Point		35.5	0.0	
Default industrial noise	Point		36.1	0.0	
Default industrial noise	Point		36.7	0.0	
Default industrial noise	Point		37.6	0.0	
Default industrial noise	Point		38.6	0.0	
Default industrial noise	Point		39.0	0.0	
Default industrial noise	Point		52.0	0.0	
Default industrial noise	Point		52.5	0.0	
Default industrial noise	Point		53.5	0.0	
Default industrial noise	Point		55.1	0.0	
Default industrial noise	Point		56.7	0.0	
Default industrial noise	Point		57.0	0.0	
Default parking lot noise	PLot		51.2	0.0	
Default industrial noise	Point		22.2	0.0	
Default industrial noise	Point		18.4	0.0	
Default industrial noise	Point		16.8	0.0	
Default industrial noise	Point		18.1	0.0	

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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	12.5kHz	16kHz	20kHz	
	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)	dB(A)	dB(A)	
Receiver 11416041,3746440 Fl G Lr,lim dB(A) Leq,d 48.4 dB(A)																																
Leq,d	32.7					19.9			27.1			17.0			23.4			25.7			27.1			20.3			0.3			-49.2		
Leq,d	35.1	-12.1	-7.3	-3.2	-1.6	3.3	8.6	7.1	22.0	12.1	13.0	13.7	16.6	21.1	22.5	23.0	26.1	30.0	25.0	24.9	23.7	20.2	15.9	10.5	3.3	-8.7	-25.4	-47.4	-76.7			
Leq,d	39.6	16.9	18.6	13.7	27.2	33.3	31.4	22.2	19.0	17.5	16.7	17.5	21.6	29.1	20.4	19.9	23.3	23.1	21.5	21.5	29.9	32.0	12.3	4.9	-3.4	-13.8	-27.2	-50.2	-78.6			
Leq,d	40.1	17.3	19.0	14.2	27.6	33.8	32.0	22.9	19.8	18.2	17.1	17.9	22.0	29.5	20.8	20.3	23.9	23.6	22.1	22.1	30.6	32.6	13.0	5.7	-2.4	-12.5	-25.5	-47.9	-75.3			
Leq,d	40.9	17.7	19.4	14.6	28.1	34.3	32.6	23.6	20.6	19.2	17.5	18.3	22.7	30.2	21.5	20.9	25.0	24.7	23.2	23.3	31.8	33.9	14.4	7.2	-0.7	-10.5	-23.1	-44.9	-71.5			
Leq,d	40.8	16.0	17.7	12.7	26.1	32.2	30.4	21.0	17.8	16.3	16.0	16.9	21.1	28.6	19.9	22.6	26.0	26.0	24.8	25.0	33.6	35.6	15.8	7.9	-1.3	-13.1	-28.5	-54.1	-85.2			
Leq,d	40.3	16.3	18.0	13.1	26.5	32.6	30.8	21.4	18.3	16.8	16.3	17.2	21.5	29.0	20.4	20.0	25.5	25.3	23.9	24.0	32.4	34.3	14.3	6.5	-2.5	-13.8	-28.4	-52.7	-82.6			
Leq,d	39.5	16.6	18.3	13.4	26.8	32.9	31.1	21.8	18.6	17.1	16.6	17.4	21.6	29.1	20.5	20.1	23.4	23.2	21.7	21.7	30.1	32.1	12.4	4.9	-3.5	-14.1	-27.8	-51.3	-80.3			
Leq,d	16.0	-31.1	-25.1	-21.2	-8.3	-3.4	-9.5	-2.9	-1.1	-2.3	-0.7	-0.8	1.0	2.1	3.0	6.8	8.9	4.6	6.2	7.0	4.1	3.8	-1.4	-3.6	-10.5	-18.2	-34.6	-56.3	-81.5			
Leq,d	15.6	-33.0	-27.0	-23.0	-10.0	-5.1	-11.1	-4.1	-2.1	-3.2	-1.3	-1.3	0.6	1.5	2.5	6.3	8.4	4.2	5.8	6.7	3.8	3.5	-1.6	-3.7	-10.7	-18.3	-34.7	-56.3	-81.5			
Leq,d	17.4	-31.8	-25.8	-21.8	-8.8	-3.8	-9.9	-2.4	-0.4	-1.5	0.4	0.5	2.4	3.3	4.2	8.1	10.1	5.8	7.6	8.5	5.8	5.7	1.0	-0.6	-6.7	-13.0	-27.4	-46.0	-67.2	-96.6		
Leq,d	19.7	-30.2	-24.2	-20.2	-7.2	-2.3	-8.3	-0.2	1.7	0.6	2.6	2.6	4.5	5.5	6.5	10.4	12.1	8.0	9.8	10.8	8.3	8.5	4.2	3.2	-2.0	-6.8	-19.1	-34.7	-51.6	-75.3		
Leq,d	22.3	-17.4	-12.7	-8.7	-7.3	-2.6	2.3	0.8	15.2	4.7	4.8	4.7	6.7	9.5	10.0	9.6	13.2	16.2	10.4	9.4	7.5	3.3	-1.5	-7.1	-14.1	-25.3	-40.6	-60.3	-86.0			
Leq,d	22.1	-19.0	-14.4	-10.5	-9.2	-4.6	0.3	-1.6	12.7	2.3	3.6	3.7	5.9	8.5	9.1	11.2	13.8	16.8	11.0	9.9	7.8	3.3	-2.0	-8.4	-16.6	-29.5	-47.1	-69.8				
Leq,d	22.3	-18.7	-14.1	-10.2	-8.8	-4.3	0.7	-1.2	13.2	2.8	3.9	4.1	6.3	8.9	9.5	9.2	14.0	17.1	11.3	10.2	8.1	3.6	-1.6	-7.9	-16.0	-28.6	-45.8	-67.9	-97.3			
Leq,d	21.2	-18.4	-13.8	-9.9	-8.5	-3.9	1.0	-0.9	13.5	3.1	4.0	4.1	6.3	8.9	9.5	9.2	12.0	15.1	9.2	8.2	6.2	1.8	-3.1	-9.1	-16.6	-28.6	-45.1	-66.4	-95.0			
Leq,d	21.1	-18.2	-13.5	-9.6	-8.3	-3.7	1.2	-0.6	13.7	3.3	3.9	4.0	6.1	8.7	9.3	9.0	11.9	14.9	9.1	8.0	6.0	1.8	-3.2	-9.0	-16.4	-28.2	-44.3	-65.2	-93.1			
Leq,d	21.6	-17.8	-13.1	-9.1	-7.8	-3.2	1.8	0.1	14.4	3.9	4.3	4.3	6.4	9.0	9.6	9.2	12.4	15.4	9.6	8.6	6.6	2.4	-2.5	-8.2	-15.4	-26.9	-42.6	-62.8	-89.7			
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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	12.5kHz	16kHz	20kHz	
	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)	dB(A)	dB(A)	
Leq,d																																
Receiver 11416249,3746618 Fl G Lr,lim dB(A) Leq,d 57.2 dB(A)																																
Leq,d	38.0					23.0			32.6			21.9			27.4			31.0			32.5			27.2			11.1			-27.8		
Leq,d	46.1	-7.0	-2.3	1.9	3.4	8.3	13.7	15.2	30.7	21.3	21.3	22.0	24.9	29.8	31.2	31.8	36.1	40.7	36.5	36.9	36.7	34.4	31.7	28.6	24.9	18.2	9.2	-1.5	-15.5	-33.0	-52.7	
Leq,d	51.2	19.1	20.5	15.3	28.4	34.1	33.7	25.3	21.5	20.5	20.1	20.1	23.7	30.7	21.6	20.9	31.0	33.1	32.9	34.5	45.3	49.0	30.8	25.3	19.5	12.3	3.3	-13.6	-33.6	-58.7	-88.9	
Leq,d	49.7	19.0	20.4	15.2	28.2	33.9	33.6	25.2	21.4	21.4	20.2	20.2	23.8	30.7	21.6	20.9	29.7	31.9	31.5	32.8	43.0	47.7	29.6	24.1	18.3	11.3	2.5	-14.1	-33.6	-57.9	-86.9	
Leq,d	41.6	19.0	20.4	15.1	28.1	33.8	33.5	25.2	21.4	21.4	20.3	20.3	23.8	30.7	21.7	20.9	25.3	25.6	24.0	24.1	32.8	35.3	16.3	10.4	4.6	-1.8	-9.2	-23.4	-39.6	-60.1	-86.1	
Leq,d	46.9	19.3	20.9	15.8	29.1	35.0	34.6	26.3	22.9	21.1	21.5	21.6	25.2	32.2	23.0	22.1	25.3	30.7	29.9	30.8	40.3	43.7	25.6	20.5	15.1	8.8	-0.2	-17.2	-38.0	-64.2	-96.1	
Leq,d	48.4	19.3	20.8	15.7	28.9	34.7	34.3	26.0	22.5	20.5	20.9	20.9	24.5	31.4	22.3	21.4	30.4	32.0	31.3	32.4	42.0	45.6	27.8	23.0	17.9	11.3	2.3	-15.1	-35.7	-61.7	-93.3	
Leq,d	50.3	19.2	20.7	15.5	28.6	34.3	33.9	25.6	21.9	19.9	20.4	20.4	24.0	30.9	21.8	21.1	30.7	32.6	32.2	33.6	43.7	48.1	30.6	25.1	19.2	12.0	2.9	-14.3	-34.5	-60.1	-90.9	
Leq,d	17.6	-30.3	-24.6	-21.0	-8.5	-4.1	-8.7	-1.5	-0.4	-2.4	-1.6	-2.6	-1.6	-1.4	-1.4	1.5	8.6	6.5	8.5	9.9	8.0	9.3	5.0	3.6	-2.1	-7.9	-21.5	-39.0	-58.3	-84.6		
Leq,d	14.6	-32.5	-26.9	-23.2	-10.7	-6.2	-10.6	-3.6	-2.5	-4.4	-3.5	-4.5	-3.6	-3.4	-3.5	-0.5	0.5	5.5	7.1	7.9	5.0	4.8	-0.1	-2.0	-8.6	-15.6	-30.9	-51.0	-73.7			
Leq,d	11.4	-31.7	-26.1	-22.5	-10.0	-5.6	-10.0	-2.7	-1.6	-3.6	-2.8	-3.8	-2.9	-2.9	-2.9	0.0	4.0	0.6	1.6	1.7	-1.8	-2.7	-8.2	-10.5	-17.2	-23.7	-37.6	-54.5	-72.2	-96.5		
Leq,d	13.0	-31.4	-25.8	-22.2	-9.7	-5.3	-9.8	-2.6	-1.5	-3.5	-2.7	-3.7	-2.8	-2.7	-2.7	0.2	4.1	0.7	1.6	5.1	3.7	3.4	-1.7	-3.7	-10.3	-18.4	-35.0	-54.1	-72.5	-97.0		
Leq,d	26.4	-15.9	-11.6	-7.9	-6.8	-2.5	6.4	5.7	19.6	8.8	9.3	9.0	10.8	13.0	13.4	12.9	16.8	20.5	14.8	13.9	12.2	8.5	4.4	0.0	-4.9	-12.6	-22.8	-34.9	-50.6	-70.5	-93.7	
Leq,d	30.3	-15.6	-11.1	-7.2	-5.9	-1.3	5.1	6.3	20.6	10.1	10.4	10.3	12.1	14.4	14.7	14.1	16.7	25.6	20.6	20.5	19.7	16.8	13.7	10.0	5.5	-2.3	-13.5	-28.7	-49.0	-74.7		
Leq,d	31.7	-15.6	-11.1	-7.3	-6.1	-1.7	4.9	6.1	20.3	9.6	9.9	9.6	11.4	13.7	13.9	13.4	21.8	26.9	22.1	22.1	21.5	18.8	15.8	12.5	8.6	0.5	-11.3	-26.6	-46.8	-72.2		
Leq,d	32.6	-15.7	-11.3	-7.5	-6.4	-2.0	4.5	5.8	19.8	9.0	9.4	9.1	10.9	13.2	13.5	13.1	22.2	27.5	23.0	23.3	23.2	21.4	18.7	14.7	9.7	1.1	-10.8	-25.7	-45.6	-70.6	-98.5	
Leq,d	33.2	-15.8	-11.4	-7.7	-6.6	-2.3	4.3	5.6	19.5	8.7	9.1	8.8	10.7	12.9	13.3	12.9	22.5	28.0	23.6	24.3	24.7	22.2	18.9	14.9	10.0	1.5	-10.3	-25.1	-44.7	-69.2	-96.5	
Leq,d	31.8	-15.9	-11.5	-7.8	-6.7	-2.4	6.3	5.6	19.6	8.7	9.2	8.9	10.7	13.0	13.3	12.9	21.2	26.8	22.2	22.5	22.3	20.5	17.6	13.7	8.8	0.4	-11.2	-25.7	-44.8	-68.5	-94.5	
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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	12.5kHz	16kHz	20kHz	
	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)	dB(A)	dB(A)	
Leq,d																																
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Receiver 11416344,3746289 Fl G Lr,lim dB(A) Leq,d 44.0 dB(A)																																
Leq,d	32.0					18.8			27.5			17.3			22.5			24.7			25.3			17.8			-1.4			-44.9		
Leq,d	38.3	-11.4	-6.7	-2.6	-1.1	3.7	9.0	9.8	24.6	14.7	15.0	15.7	18.6	23.1	24.4	24.9	28.0	33.5	28.8	28.8	27.7	24.3	20.3	15.4	9.1	-1.4	-16.1	-35.0	-60.4	-93.0		
Leq,d	34.2	13.7	15.0	9.6	22.5	28.1	25.7	19.1	15.4	13.4	13.0	13.1	16.9	23.8	14.8	14.4	17.0	16.8	15.2	15.3	24.0	26.4	7.2	0.8	-5.5	-13.3	-23.0	-41.0	-62.4	-90.1		
Leq,d	34.0	13.6	14.9	9.5	22.4	28.0	25.6	16.5	15.3	13.4	12.9	13.1	16.8	23.8	14.8	14.4	17.0	16.5	14.9	15.0	23.6	25.9	6.7	0.4	-5.9	-13.6	-23.4	-41.4	-63.0	-90.9		
Leq,d	33.8	13.5	14.8	9.4	22.3	27.9	25.5	16.4	15.2	13.2	12.8	12.9	16.7	23.6	14.6	14.2	16.8	16.4	14.8	14.8	23.4	25.8	6.5	0.2	-5.9	-13.7	-23.7	-41.8	-63.6	-91.7		
Leq,d	34.3	13.8	15.1	9.7	22.6	28.2	25.8	19.2	15.6	13.6	13.2	13.3	17.1	24.0	15.0	14.6	17.2	16.8	15.2	15.2	23.8	26.2	7.0	0.6	-5.6	-13.2	-22.8	-40.6	-61.8	-89.3		
Leq,d	34.7	13.9	15.3	9.9	22.9	28.5	26.1	19.5	15.9	14.0	13.5	13.7	17.5	24.4	15.4	15.0	17.6	17.4	15.8	15.9	24.5	26.9	7.7	1.2	-5.4	-13.1	-22.8	-40.6	-61.9	-89.4		
Leq,d	34.6	13.9	15.2	9.8	22.8	28.4	26.0	19.4	15.8	13.8	13.4	13.6	17.3	24.3	15.3	14.9	17.4	17.2	15.6	15.7	24.4	26.8	7.6	1.0	-5.4	-13.1	-22.9	-40.8	-62.1	-89.7		
Leq,d	19.7	-32.6	-26.5	-22.6	-9.6	-4.6	-10.6	-0.2	1.7	0.7	2.6	2.7	4.6	5.5	6.5	10.4	12.2	8.1	9.8	10.9	8.3	8.5	4.1	3.1	-2.1	-7.0	-19.3	-35.0	-51.8	-75.6		
Leq,d	24.2	-29.9	-23.9	-19.9	-6.9	-1.9	-7.9	2.5	4.5	3.5	5.5	5.6	7.6	8.6	9.7	13.7	15.7	11.8	13.9	15.4	13.5	14.8	12.1	12.0	7.7	4.0	-6.4	-19.3	-32.2	-50.9	-75.1	
Leq,d	20.9	-31.8	-25.7	-21.7	-8.7	-3.8	-9.8	-1.7	2.7	1.6	3.6	3.6	5.6	6.5	7.5	11.4	13.2	9.2	11.0	12.1	9.7	10.1	6.0	5.4	0.8	-3.3	-14.4	-28.4	-42.7	-63.7	-92.0	
Leq,d	19.5	-33.0	-27.0	-23.0	-10.0	-5.0	-11.0	-3.0	-1.1	0.4	2.3	2.4	4.3	5.3	6.3	10.2	12.0	7.8	9.7	10.8	8.3	8.6	4.3	3.4	-1.6	-6.3	-18.4	-33.8	-50.0	-74.0		
Leq,d	15.9	-22.1	-18.1	-14.7	-14.0	-10.0	-5.6	-7.2	9.2	-1.5	-0.4	-0.6	1.4	3.6	4.0	4.1	6.1	9.1	3.4	2.5	0.8	-2.3	-5.9	-10.1	-15.2	-24.4	-36.9	-52.9	-74.1			
Leq,d	16.5	-21.7	-17.6	-14.2	-13.5	-9.4	-5.0	-4.0	9.9	-0.8	0.3	0.1	2.1	4.3	4.7	4.7	6.7	9.8	4.1	3.2	1.5	-2.0	-5.5	-9.7	-14.9	-23.8	-36.1	-51.6	-72.3	-98.9		
Leq,d	16.9	-21.6	-17.5	-14.1	-13.3	-9.3	-4.8	-3.8	10.1	-0.6	0.5	0.4	2.3	4.5	5.0	5.0	7.0	10.3	4.7	3.8	2.2	-1.5	-5.1	-9.3	-14.7	-23.7	-36.0	-51.6	-72.4	-99.0		
Leq,d	16.8	-21.7	-17.6	-14.2	-13.4	-9.4	-5.0	-4.0	10.0	-0.8	0.4	0.2	2.2	4.4	4.8	4.8	6.8	10.2	4.5	3.7	2.0	-1.6	-5.1	-9.4	-14.7	-23.8	-36.2	-51.8	-72.6	-99.3		
Leq,d	16.4	-21.9	-17.8	-14.4	-13.7	-9.7	-5.3	-4.4	9.6	-1.2	0.0	-0.2	1.7	3.9	4.3	4.4	6.4	9.8	4.1	3.3	1.7	-1.6	-5.2	-9.4	-14.8	-23.9	-36.3	-52.0	-72.9	-99.7		
Leq,d	16.1	-22.0	-17.9	-14.6	-13.8	-9.8	-5.4	-6.9	9.5	-1.3	-0.2	-0.3	1.6	3.8	4.2	4.3	6.3	9.3	3.6	2.7	1.0	-2.2	-5.7	-9.9	-15.2	-24.2	-36.7	-52.4	-73.4			
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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	12.5kHz	16kHz	20kHz	
	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)	dB(A)	dB(A)	
Leq,d																																
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Receiver 11416374,3746467 FI G Lr,lim dB(A) Leq,d 58.7 dB(A)																																
Leq,d	52.8					37.6			47.4			38.8			43.8			45.4			46.0			42.8			35.3			20.1		
Leq,d	51.6	-1.8	3.2	7.7	9.8	15.1	20.6	21.9	36.9	27.2	25.4	26.1	29.0	33.9	35.3	36.2	42.5	46.6	41.9	42.1	41.6	39.1	36.6	33.9	30.9	25.3	18.1	9.9	-0.4	-13.0	-26.8	
Leq,d	46.9	25.8	27.2	22.0	35.0	40.6	38.2	30.9	27.2	25.2	24.3	24.5	28.3	35.3	27.6	27.7	30.0	29.7	28.2	28.3	37.2	40.1	21.8	16.7	12.1	7.9	3.5	-6.4	-16.5	-29.0	-45.2	
Leq,d	45.8	24.4	25.9	20.6	33.6	39.2	36.9	29.5	25.9	23.9	23.2	23.4	27.2	34.2	26.6	26.8	29.1	28.8	27.3	27.4	36.3	39.1	20.7	15.5	10.6	5.9	1.1	-9.4	-20.4	-34.1	-51.7	
Leq,d	44.8	23.3	24.8	19.5	32.5	38.1	35.8	28.4	24.8	22.8	22.2	22.4	26.2	33.3	25.8	26.0	28.3	28.0	26.5	26.6	35.5	38.3	19.8	14.5	9.3	4.3	-0.9	-12.1	-23.9	-38.7	-57.5	
Leq,d	51.0	30.1	31.6	26.4	39.5	45.3	43.0	35.9	32.1	29.9	28.6	28.6	32.2	39.1	31.0	30.9	33.3	33.0	31.5	31.5	40.5	43.5	25.4	20.7	17.0	13.6	10.3	2.0	-6.1	-16.0	-28.9	
Leq,d	49.6	28.5	29.9	24.7	37.9	43.6	41.2	34.0	30.3	28.1	27.1	27.1	30.8	37.8	29.9	29.9	32.2	31.9	30.5	30.5	39.5	42.5	24.3	19.4	15.2	11.5	7.9	-1.0	-9.7	-20.5	-34.5	
Leq,d	48.2	27.0	28.4	23.2	36.3	42.0	39.6	32.3	28.6	26.5	25.6	25.7	29.5	36.5	28.7	28.8	31.1	30.8	29.3	29.4	38.3	41.3	23.0	18.0	13.5	9.5	5.6	-3.9	-13.3	-25.0	-40.1	
Leq,d	29.2	-19.3	-13.3	-9.4	3.5	8.4	2.3	10.2	12.0	10.7	12.5	12.2	13.9	14.4	16.8	20.4	21.9	17.5	19.0	19.7	17.1	17.3	13.4	13.2	9.5	7.2	-1.1	-10.6	-18.4	-29.8	-44.0	
Leq,d	27.8	-21.7	-15.7	-11.8	1.1	6.0	0.0	7.9	9.7	8.6	10.4	10.2	11.9	12.6	14.5	18.9	20.5	16.1	17.7	18.5	15.9	16.2	12.2	12.1	8.2	5.5	-3.3	-13.6	-22.7	-35.8	-52.9	
Leq,d	23.0	-25.5	-19.5	-15.6	-2.7	2.2	-4.0	3.9	5.7	4.4	6.1	5.8	7.4	8.0	10.0	14.5	16.0	11.5	13.0	13.7	10.9	10.9	6.5	5.9	1.1	-2.9	-13.4	-26.1	-38.4	-55.5	-76.8	
Leq,d	19.7	-28.9	-22.9	-19.0	-6.0	-1.2	-7.3	0.6	2.3	1.0	2.7	2.4	4.0	4.6	6.8	11.3	12.8	8.3	9.7	10.4	7.4	7.3	2.5	1.1	-4.4	-9.6	-22.0	-37.7	-54.1	-76.7		
Leq,d	27.4	-11.8	-7.5	-4.0	-3.1	1.1	5.5	5.8	19.8	9.1	10.0	9.8	11.9	14.2	15.9	16.4	18.1	21.2	15.6	14.7	13.2	9.7	6.1	2.6	-1.0	-7.0	-14.6	-23.4	-34.7	-48.7	-64.5	
Leq,d	33.4	-4.9	-0.6	3.1	4.2	8.4	12.9	13.3	27.1	16.2	16.4	16.0	17.9	20.1	21.9	21.5	23.4	26.5	20.9	19.9	18.5	15.3	12.5	10.0	7.4	2.8	-2.9	-9.1	-16.6	-25.8	-35.5	
Leq,d	32.0	-6.6	-2.2	1.5	2.5	6.6	11.1	11.4	25.3	14.4	14.8	14.6	16.5	18.8	20.2	20.4	22.3	25.4	19.8	18.8	17.4	14.2	10.9	8.2	5.5	0.6	-5.5	-12.1	-20.4	-30.4	-41.2	
Leq,d	30.7	-8.1	-3.7	-0.1	0.8	5.0	9.4	9.7	23.6	12.8	13.4	13.2	15.1	17.5	19.0	19.3	21.1	24.2	18.6	17.6	16.2	12.9	9.5	6.6	3.7	-1.5	-8.0	-15.1	-24.0	-35.0	-46.9	
Leq,d	29.4	-9.3	-5.0	-1.4	-0.5	3.6	8.0	8.3	22.2	11.4	12.1	11.9	13.9	16.2	17.8	18.2	19.9	23.0	17.4	16.5	15.1	11.7	8.2	5.2	2.2	-3.2	-10.0	-17.6	-27.2	-39.0	-52.0	
Leq,d	28.4	-10.7	-6.4	-2.8	-1.9	2.2	6.6	6.9	20.9	10.1	10.9	10.8	12.8	15.1	16.8	17.2	19.0	22.1	16.4	15.5	14.1	10.7	7.1	3.8	0.5	-5.3	-12.5	-20.7	-31.2	-44.2	-58.6	
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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	12.5kHz	16kHz	20kHz	
	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)	dB(A)	dB(A)	
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Leq,d	53.4					38.5			48.1			39.6			44.6			46.0			46.5			43.4			35.9			20.9		
Leq,d	54.9	-0.1	5.1	10.0	12.0	17.2	22.6	24.0	39.0	29.4	29.9	30.7	33.7	38.4	39.8	40.4	45.6	49.8	45.2	45.3	44.9	42.6	40.2	37.9	35.4	30.6	24.6	18.1	10.0	0.4	-9.6	
Leq,d	65.4	26.7	28.6	23.8	37.5	43.8	42.3	35.9	33.3	32.4	32.0	33.0	37.7	47.4	39.4	42.2	48.2	48.8	48.4	49.4	59.3	63.2	46.0	42.0	38.4	34.8	31.1	21.7	12.2	0.2	-15.3	
Leq,d	63.8	25.2	27.1	22.3	35.9	42.3	40.7	34.3	31.6	30.6	30.0	31.1	35.8	45.6	37.6	37.8	46.5	47.3	46.8	47.8	57.7	61.6	44.3	40.2	36.4	32.5	28.3	18.4	7.9	-5.2	-22.2	
Leq,d	62.5	24.1	25.9	21.1	34.8	41.1	39.5	33.0	30.3	29.3	28.5	29.6	34.2	44.2	36.2	36.4	44.0	46.0	45.6	46.6	56.5	60.3	42.9	38.7	34.8	30.6	26.1	15.5	4.2	-10.0	-28.3	
Leq,d	71.0	36.6	38.4	33.6	47.2	53.5	51.9	45.7	42.8	41.7	39.0	40.1	46.3	56.2	48.2	48.5	53.5	54.2	53.7	54.6	64.6	68.7	51.6	47.9	44.8	41.9	39.3	31.5	24.2	15.1	3.3	
Leq,d	68.8	34.4	36.2	31.4	45.0	51.3	49.7	43.4	40.6	39.5	36.1	37.2	41.9	52.8	45.6	45.9	51.3	52.0	51.5	52.5	62.5	66.5	49.3	45.6	42.3	39.2	36.1	27.8	19.7	9.7	-3.4	
Leq,d	66.8	28.1	30.0	25.2	38.9	45.3	43.9	37.7	35.1	34.3	33.7	34.8	39.5	49.1	43.5	43.8	49.5	50.2	49.7	50.7	60.7	64.6	47.4	43.6	40.1	36.7	33.4	24.5	15.6	4.6	-9.8	
Leq,d	27.1	-20.2	-14.2	-10.3	2.6	7.5	1.5	9.4	11.2	10.0	11.9	11.7	13.4	14.1	14.7	18.3	19.8	15.2	16.5	17.1	14.2	14.2	10.0	9.6	5.8	3.3	-4.9	-14.2	-21.8	-33.0	-47.7	
Leq,d	25.8	-26.6	-20.6	-14.1	-1.2	3.7	-2.3	5.6	7.5	6.3	8.2	8.1	9.8	10.6	11.3	16.3	18.7	14.4	16.0	16.9	14.2	14.5	10.4	9.9	5.8	2.7	-6.7	-18.1	-28.7	-44.1	-64.0	
Leq,d	19.9	-26.4	-20.4	-16.4	-3.5	1.3	-4.8	3.1	4.9	3.6	5.4	5.1	6.7	7.3	7.9	11.3	12.6	7.8	9.0	9.4	6.3	6.0	1.3	0.2	-4.7	-8.7	-19.3	-32.0	-44.3	-61.8	-84.0	
Leq,d	18.1	-29.2	-23.2	-19.2	-6.3	-1.4	-7.4	0.5	2.3	1.1	3.0	2.8	4.6	5.3	5.9	9.5	10.9	6.3	7.6	8.1	5.0	4.6	-0.4	-1.9	-7.5	-12.7	-25.1	-40.4	-56.5	-79.0		
Leq,d	45.7	-10.7	-5.9	-1.7	-0.1	4.8	10.2	11.4	26.3	16.6	17.5	18.3	21.2	26.5	30.4	31.0	35.5	41.0	36.4	36.5	36.0	33.6	31.0	28.4	25.4	19.8	12.5	4.1	-6.7	-20.2	-35.5	
Leq,d	54.4	1.7	6.5	10.7	12.2	17.2	22.5	23.9	38.8	29.0	27.9	31.1	34.1	38.5	40.0	40.6	45.0	49.1	44.5	44.4	44.1	41.9	39.7	37.6	35.4	31.2	25.8	20.2	13.3	4.9	-3.9	
Leq,d	52.1	-0.4	4.4	8.5	10.1	15.1	20.4	21.7	36.6	26.8	25.1	25.9	31.3	36.0	37.4	38.0	42.8	47.0	42.3	42.3	41.9	39.7	37.4	35.2	32.9	28.4	22.6	16.5	8.9	-0.5	-10.6	
Leq,d	50.2	-6.7	-1.9	2.3	4.0	9.0	14.5	15.9	31.1	21.6	22.7	23.5	26.5	33.8	35.2	35.9	41.1	45.2	40.5	40.5	40.1	37.9	35.5	33.2	30.7	26.0	19.8	13.2	4.8	-5.6	-16.9	
Leq,d	48.7	-8.1	-3.3	0.9	2.6	7.6	13.0	14.3	29.3	19.7	20.9	21.8	24.7	32.2	33.6	34.2	39.7	43.8	39.1	39.2	38.8	36.4	34.0	31.6	29.0	24.0	17.6	10.4	1.3	-10.0	-22.4	
Leq,d	47.1	-9.6	-4.8	-0.6	1.0	6.0	11.4	12.6	27.6	17.9	19.0	19.8	22.7	27.9	31.8	32.4	38.0	42.3	37.6	37.7	37.2	34.8	32.4	29.8	27.0	21.7	14.8	7.0	-3.0	-15.5	-29.4	
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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	12.5kHz	16kHz	20kHz	
	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)	dB(A)	dB(A)	
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Leq,d	43.7					27.0			38.2			27.4			33.1			36.8			38.1			33.7			21.8			-3.9		
Leq,d	51.2	-3.6	1.2	5.4	7.0	11.9	19.0	20.6	35.6	25.9	25.6	26.4	29.4	34.2	35.7	36.3	41.5	45.9	41.6	41.9	41.7	39.3	36.8	34.1	31.0	25.4	18.3	10.4	0.5	-11.4	-24.2	
Leq,d	53.5	17.2	19.0	14.2	27.8	34.1	32.5	27.1	24.3	24.4	24.3	25.4	30.0	39.7	31.7	32.0	35.5	36.2	35.7	37.3	47.3	51.1	33.6	29.3	25.0	19.2	11.7	-3.4	-21.0	-43.5	-72.2	
Leq,d	52.5	16.9	18.7	13.9	27.5	33.8	32.2	26.8	24.0	22.9	24.0	25.1	29.7	39.3	31.2	31.5	35.0	35.6	35.1	36.6	46.4	49.9	32.1	27.3	22.3	16.6	9.7	-5.0	-22.7	-45.8	-75.2	
Leq,d	52.0	16.7	18.5	13.7	27.3	33.6	31.9	26.5	23.7	22.5	23.7	24.8	29.4	38.9	30.9	31.1	34.6	35.2	34.6	36.2	45.9	49.4	31.4	26.2	20.8	14.5	6.7	-8.4	-26.0	-48.9	-78.4	
Leq,d	57.0	17.7	19.5	14.7	28.3	34.7	35.4	27.9	25.1	26.4	25.0	26.0	30.7	40.7	32.8	33.2	37.0	38.0	38.0	40.0	51.1	54.9	37.0	32.0	26.8	20.8	13.5	-1.0	-17.7	-39.0	-66.2	
Leq,d	56.7	17.5	19.4	14.6	28.2	34.5	32.9	27.6	24.9	26.2	24.8	25.8	30.5	40.4	32.6	32.9	36.7	37.6	37.6	39.5	50.8	54.7	36.8	31.7	26.5	20.4	13.0	-1.7	-18.6	-40.4	-68.0	
Leq,d	55.1	17.4	19.2	14.4	28.0	34.3	32.7	27.4	24.6	25.9	24.5	25.6	30.3	40.0	32.1	32.5	36.0	36.9	36.6	38.2	48.7	53.1	36.0	31.3	26.0	19.9	12.3	-2.6	-19.8	-42.0	-70.1	
Leq,d	22.2	-32.0	-26.0	-22.0	-9.0	-4.0	-10.0	0.4	2.4	1.3	3.3	3.4	5.4	6.5	7.5	11.6	13.6	9.7	11.8	13.4	11.6	13.4	9.9	9.1	4.0	-0.8	-12.8	-28.0	-44.0	-66.7	-95.9	
Leq,d	18.4	-33.8	-27.7	-23.7	-10.8	-5.8	-9.4	-1.7	0.2	-0.9	1.1	1.1	3.0	4.0	4.9	8.8	10.7	6.5	9.1	10.1	7.4	7.3	2.6	1.1	-4.8	-10.7	-24.5	-42.3	-61.9	-89.4		
Leq,d	18.1	-34.0	-27.9	-23.9	-11.0	-6.0	-12.0	-1.9	0.0	-1.1	0.9	0.9	2.8	3.8	4.7	8.6	10.5	6.4	8.1	9.1	6.7	7.4	2.7	1.2	-4.8	-10.8	-24.7	-42.6	-62.4	-90.1		
Leq,d	16.8	-34.9	-28.8	-24.8	-11.9	-6.9	-12.9	-3.1	-1.1	-2.2	-0.3	-0.3	1.7	2.6	3.5	7.4	9.4	5.2	6.9	7.8	6.0	5.8	0.8	-1.2	-7.7	-14.5	-29.7	-49.4	-71.9			
Leq,d	35.5	-18.2	-13.4	-9.3	-7.7	-2.7	2.6	7.3	22.2	12.3	12.7	13.5	16.4	21.2	22.6	23.2	26.1	30.1	25.4	25.7	25.1	22.3	19.1	15.6	11.2	3.6	-6.9	-19.9	-37.1	-59.1	-85.8	
Leq,d	39.0	-17.2	-12.4	-8.2	-6.6	-1.7	6.0	8.6	23.5	13.7	14.0	14.7	17.7	23.0	24.5	25.2	28.5	33.0	28.8	29.8	30.7	28.1	25.1	21.6	17.4	10.0	0.0	-12.4	-28.7	-49.5	-73.7	
Leq,d	38.6	-17.3	-12.6	-8.4	-6.8	-1.8	3.5	8.4	23.3	13.5	13.7	14.5	17.5	22.7	24.3	25.0	28.2	32.6	28.4	29.2	30.2	27.9	24.8	21.3	17.1	9.6	-0.6	-13.1	-29.7	-50.8	-75.5	
Leq,d	37.6	-17.5	-12.7	-8.6	-7.0	-2.0	3.3	8.1	23.0	13.3	13.5	14.3	17.2	22.3	23.8	24.5	27.5	31.8	27.4	27.9	28.2	26.3	24.1	20.9	16.6	9.0	-1.2	-14.0	-30.8	-52.4	-77.5	
Leq,d	36.7	-17.7	-12.9	-8.8	-7.2	-2.2	3.1	7.9	22.8	13.0	13.3	14.1	17.0	21.9	23.4	24.0	27.0	31.1	26.5	27.1	26.8	24.3	21.7	18.9	15.6	8.4	-1.9	-14.8	-32.0	-53.9	-79.6	
Leq,d	36.1	-18.0	-13.2	-9.0	-7.4	-2.5	2.8	7.6	22.5	12.6	13.0	13.8	16.7	21.5	23.0	23.6	26.5	30.6	25.9	26.4	25.9	23.2	20.2	16.9	12.9	5.7	-3.8	-16.5	-33.7	-56.2	-82.6	
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Time slice	Sum dB(A)	25Hz dB(A)	31.5Hz dB(A)	40Hz dB(A)	50Hz dB(A)	63Hz dB(A)	80Hz dB(A)	100Hz dB(A)	125Hz dB(A)	160Hz dB(A)	200Hz dB(A)	250Hz dB(A)	315Hz dB(A)	400Hz dB(A)	500Hz dB(A)	630Hz dB(A)	800Hz dB(A)	1kHz dB(A)	1.25kHz dB(A)	1.6kHz dB(A)	2kHz dB(A)	2.5kHz dB(A)	3.15kHz dB(A)	4kHz dB(A)	5kHz dB(A)	6.3kHz dB(A)	8kHz dB(A)	10kHz dB(A)	12.5kHz dB(A)	16kHz dB(A)	20kHz dB(A)	
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Appendix C:

Construction Modeling Output

Receptor - Nearest Receptor to the East

Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA[1]	Edge of Site to Receptor, feet	Center of Site to Receptor, feet	Item Usage Percent[1]	Ground Factor[2]	Usage Factor	Receptor Item Lmax, dBA	Recptor. Item Leq, dBA
SITE PREP									
Tractor	1	84	82	253	40	0.66	0.40	78.3	61.3
Dozer	1	82	82	253	40	0.66	0.40	76.3	59.3
							Log Sum	78.3	63.4
GRADE									
Excavator	1	81	82	253	40	0.66	0.40	75.3	58.3
Grader	1	85	82	253	40	0.66	0.40	79.3	62.3
Dozer	1	82	82	253	40	0.66	0.40	76.3	59.3
								79.3	65.1
BUILD									
Crane	1	81	82	253	16	0.66	0.16	75.3	54.3
Generator	1	81	82	253	50	0.66	0.50	75.3	59.3
Tractor	1	84	82	253	40	0.66	0.40	78.3	61.3
Welder/Torch	1	74	82	253	40	0.66	0.40	68.3	51.3
								78.3	64.1
PAVE									
Paver	1	77	82	253	50	0.66	0.50	71.3	55.3
Compactor (ground)	1	83	82	253	20	0.66	0.20	77.3	57.3
Roller	1	80	82	253	20	0.66	0.20	74.3	54.3
								77.3	60.6
ARCH COAT									
Compressor (air)	1	78	82	253	40	0.66	0.40	72.3	55.3
								72.3	55.3

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

VIBRATION LEVEL IMPACT

Project:	Rexford Industrial Project	Date: 3/8/23
Source:	Large Bulldozer	
Scenario:	Unmitigated	
Location:	Project Site	
Address:	1500 Raymond Ave	

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 =	35.00	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 =	**0.061**	IN/SEC	OUTPUT IN RED