

Appendix F

Noise Study

U-Haul Redevelopment Project

Noise Impact Study

City of Gardena, 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 U-Haul Redevelopment Project (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. The Project must demonstrate compliance to the applicable noise criterion as outlined within the City's Noise Element and Municipal Code.

The following is provided in this report:

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

1.2 Site Location and Study Area

The Project site is located at 14206 S Van Ness Ave, in Gardena California, as shown in Exhibit A. The site is currently zoned as General Commercial (C-3) with a Mixed Use Overlay Zone (MUO) in the City of Gardena Zoning Map. The Project includes a Change of Zone to C-4. The proposed use is general commercial. To the north is the United States Post office (M-2). To the east is a mixed-use development with live-work and residential uses currently under construction (C-3/MUO). To the south is Rosecrans Avenue, and south of that is a mix of commercial uses (C-3/MUO). To the west is Van Ness Avenue, and west of that is a mix of commercial uses (C-2/MUO and C-3).

1.3 Proposed Project Description

An approximately 177,573 gross square foot, five-story storage facility would be located within the northern portion of the site and a separate 8,000-square foot single-story building for retail sales and office use would be located within the southern portion of the site, adjacent to Rosecrans Avenue; refer to Exhibit B. The proposed storage facility would provide a total of 1,620 storage units ranging in size from 5 feet by 5 feet to 10 feet by 20 feet distributed throughout the five levels and a covered truck shunting area on the ground floor. The site will have 60 parking spaces. The Project proposes 24- to 36-inch intermittent screen walls within the landscaped areas along Van Ness and Rosecrans Avenues.

This study assesses the traffic and operational noise to and from the Project site and compares the results to the applicable City noise standards. In addition, the study reviews noise generated by construction activities.

Construction activities within the Project area will consist of demolition, site preparation, grading, building construction, paving, and architectural coating.

1.4 Report Summary

A 24-hour noise measurement was taken on-site on 6/3/2021 to 6/4/2021 near the adjacent residential units. Noise levels during operational hours ranged between 57.4 dBA Leq and 65.5 dBA Leq. The CNEL level was 61.5 dBA.

The project will increase the traffic CNEL level by less than 0.1 dBA on Rosecrans and Van Ness Avenues as a result of the project which is inaudible. The noise level on the project site in 2022 with project traffic will be 72 dBA CNEL, which is conditionally acceptable for office and commercial. Standard construction will result in an interior level of 50 dBA Leq, complying with the California Building Code. The impact is less than significant, and no mitigation is required.

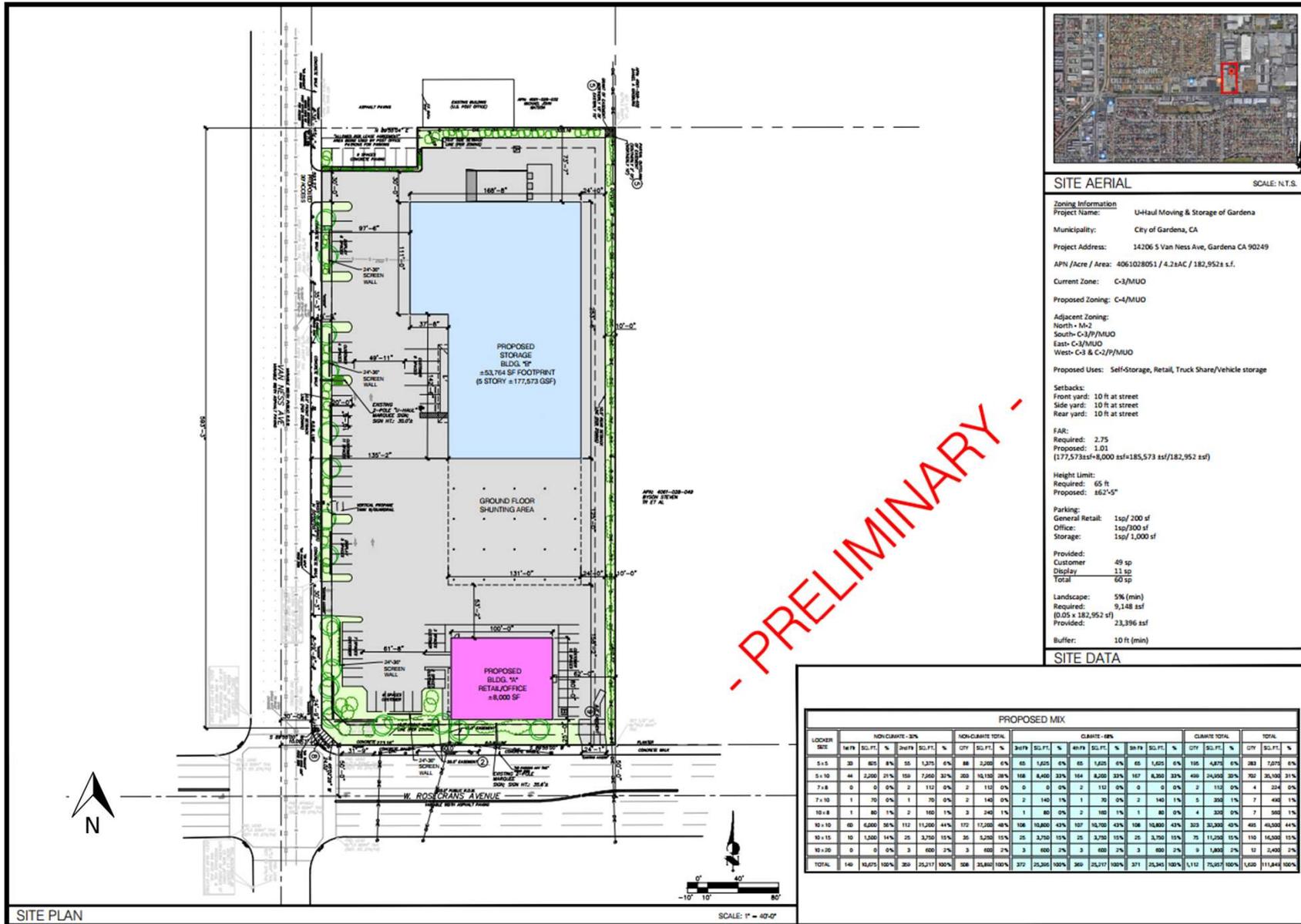
Project-only operational levels due to project operations, which includes parking lot noise and rooftop units, are between 39 dBA Leq and 46 dBA Leq at the surrounding parking lots. The ambient level is not expected to increase as a result of the project. The impact is less than significant, and no mitigation is required.

Construction noise levels will range from 67 to 79 dBA Leq at the adjacent residential property depending on the phase. Construction is anticipated to occur during the City's permissible hours of 7 AM to 6 PM on weekdays and 9 AM to 6 PM on Saturday. The impact is less than significant, and no mitigation is required.

Exhibit A
Location Map



Exhibit B
 Site Plan



SITE AERIAL SCALE: N.T.S.

Zoning Information
 Project Name: U-Haul Moving & Storage of Gardena
 Municipality: City of Gardena, CA
 Project Address: 14206 S Van Ness Ave, Gardena CA 90249
 APN / Acre / Area: 4061028051 / 4.21AC / 182,952 s.f.
 Current Zone: C-3/MUO
 Proposed Zoning: C-4/MUO
 Adjacent Zoning:
 North - M-2
 South - C-3/P/MUO
 East - C-3/MUO
 West - C-3 & C-2/P/MUO
 Proposed Uses: Self-Storage, Retail, Truck Share/Vehicle storage

Setbacks:
 Front yard: 10 ft at street
 Side yard: 10 ft at street
 Rear yard: 10 ft at street

FAR:
 Required: 2.75
 Proposed: 1.01
 (177,573ssf÷8,000 ssf=185,573 ssf/182,952 ssf)

Height Limit:
 Required: 65 ft
 Proposed: 52'-5"

Parking:
 General Retail: 1sp/200 sf
 Office: 1sp/300 sf
 Storage: 1sp/1,000 sf

Provided:
 Customer: 49 sp
 Display: 11 sp
 Total: 60 sp

Landscape:
 5% (min)
 Required: 9,148 ssf
 (0.05 x 182,952 sf)
 Provided: 23,396 ssf

Buffer:
 10 ft (min)

SITE DATA

LOCKER SIZE	NON-CLIMATE - 30%				NON-CLIMATE TOTAL				CLIMATE - 60%				CLIMATE TOTAL				TOTAL	
	sq.FT.	%	sq.FT.	%	sq.FT.	%	sq.FT.	%	sq.FT.	%	sq.FT.	%	sq.FT.	%	sq.FT.	%		
5 x 5	30	85	8%	55	1,375	6%	88	2,200	6%	65	1,625	6%	65	1,625	6%	283	7,075	6%
5 x 10	44	2,200	21%	159	7,950	31%	203	10,150	38%	168	8,400	33%	167	8,350	33%	469	24,050	31%
7 x 8	0	0	0%	2	110	0%	2	110	0%	0	0	0%	2	110	0%	4	220	0%
7 x 10	1	70	0%	1	70	0%	2	140	0%	2	140	1%	1	70	0%	5	350	1%
10 x 8	1	80	1%	2	160	1%	3	240	1%	1	80	0%	2	160	1%	4	320	0%
10 x 10	60	6,000	36%	112	11,200	44%	172	17,200	48%	106	10,600	43%	106	10,600	43%	323	32,300	44%
10 x 15	10	1,500	14%	25	3,750	15%	35	5,250	15%	25	3,750	15%	25	3,750	15%	75	11,250	15%
10 x 20	0	0	0%	3	600	2%	3	600	2%	3	600	2%	3	600	2%	9	1,800	2%
TOTAL	146	14,075	100%	209	25,211	100%	308	25,800	100%	309	25,211	100%	311	25,800	100%	1,110	75,075	100%

SHEET NOTES:

REVISIONS:

NO.	DATE	DESCRIPTION
1	1/27/21	ii review working per city comments
2	2/2/21	ii review per city comments

PROFESSIONAL SEAL:
 PRELIMINARY DOCUMENTS, NOT FOR CONSTRUCTION, FOR INFORMATION ONLY

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 U-Haul of Gardena
 14206 Van Ness Ave
 Gardena, CA 90249

SHEET CONTENTS:
 PRELIMINARY
 SITE PLAN

865031

DRAWING: J
CHECKED: ps
DATE: 01-26-21
MS031A1.DWG

2.0 Fundamentals of Noise

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

2.1 Sound, Noise, and Acoustics

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

2.2 Frequency and Hertz

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

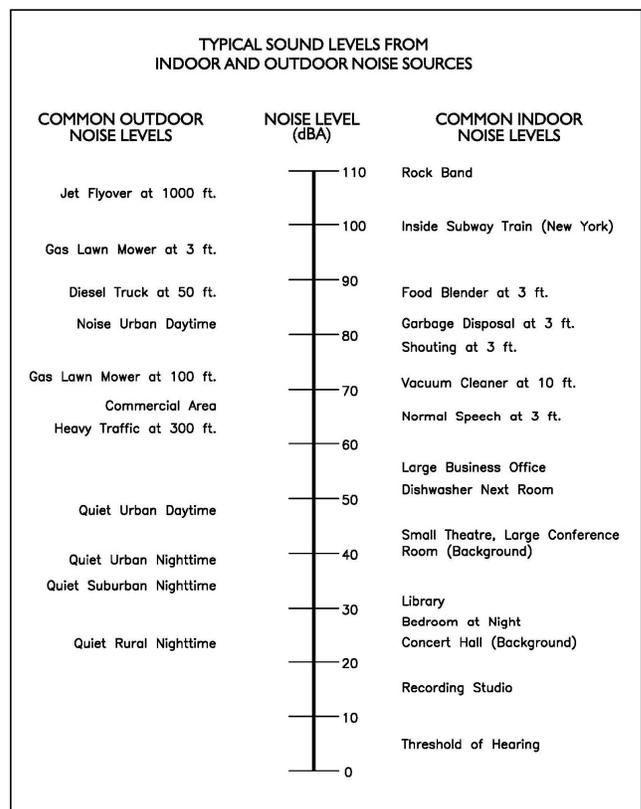
2.3 Sound Pressure Levels and Decibels

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

Exhibit C: Typical A-Weighted Noise Levels



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.

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

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

2.6 Noise Descriptors

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

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

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

Community Noise Equivalent Level (CNEL): The average equivalent A-weighted sound level during a 24-hour day, obtained after 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: Any unwanted sound or sound which is undesirable because it interferes with speech and hearing, or is intense enough to damage hearing, or is otherwise annoying. The State Noise Control Act defines noise as "...excessive undesirable sound...".

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

Percent Noise Levels: See L(n).

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

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

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

2.7 Traffic Noise Prediction

Noise levels associated with traffic depends on a variety of factors: (1) volume of traffic; (2) speed of traffic; (3) auto, medium truck (2 axle), and heavy truck percentage (3 axle and greater); and (4) 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 how far sound can travel.

3.0 Ground-Borne Vibration Fundamentals

3.1 Vibration Descriptors

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

Several different methods are used to quantify vibration amplitude.

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

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

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

3.2 Vibration Perception

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

There are three main types of vibration propagation: surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular 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.

4.0 Regulatory Setting

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

4.1 Federal Regulations

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

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

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

The federal government advocates that local 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 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. The City of Gardena has adopted their own version of the State’s Land Use Compatibility Guidelines. These are presented in Exhibit D.

Exhibit D: Land Use Compatibility Guidelines

Land Use Category	CNEL, dB						Legend
	55	60	65	70	75	80	
Residential - Single family, multifamily, duplex	A	A	B	C	C		<p>A NORMALLY ACCEPTABLE Specified land use is satisfactory based on the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.</p> <p>B CONDITIONALLY ACCEPTABLE New construction or development should be undertaken only after a detailed analysis of the noise requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.</p> <p>C NORMALLY UNACCEPTABLE New construction or development should generally be discouraged. If it does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.</p> <p>Clearly Unacceptable New construction or development should generally not be undertaken.</p>
Residential - Mobile homes	A	A	B	C	C		
Transient Lodging - Motels, hotels	A	A	B	B	C	C	
Schools, Libraries, Churches, Hospitals, Nursing Homes	A	A	B	C	C		
Auditoriums, Concert Halls, Amphitheaters, Meeting Halls	B	B	C	C			
Sports Arenas, Outdoor Spectator Sports, Amusement Parks	A	A	A	B	B		
Playgrounds, Neighborhood Parks	A	A	A	B	C		
Golf Courses, Riding Stables, Cemeteries	A	A	A	A	B	C	
Office and Professional Buildings	A	A	A	B	B	C	
Commercial Retail, Banks, Restaurants, Theaters	A	A	A	A	B	B	
Industrial, Manufacturing, Utilities, Wholesale, Service Stations	A	A	A	A	B	B	
Agriculture	A	A	A	A	A	A	

Source: Taken in part from "Aircraft Noise Impact Planning Guidelines for Local Agencies," U.S. Dept. of Housing and Urban Development, TE/NA-472, November 1972.

4.3 City of Gardena Noise Regulations

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

City of Gardena General Plan

Applicable policies and standards governing environmental noise in the City are set forth in the General Plan Noise Element. Table N-1 of the Gardena Noise Element outlines the exterior noise compatibility for community noise environments. According to Table N-1 commercial uses are normally acceptable up to 70 dBA CNEL.

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 would mitigate potential impacts on noise include the following.

N Goal 1: Use noise control measures to reduce the impact from transportation noise sources.

- N 1.1: Minimize noise conflicts between land uses and the circulation network, and mitigate sound levels where necessary or feasible to ensure the peace and quiet of the community.
- N 1.2: Reduce unnecessary traffic volumes in residential neighborhoods by limiting through-ways and by facilitating the use of alternative routes around, rather than through, neighborhoods.
- N 1.3: Promote the use of new technologies to minimize traffic noise, such as use of rubberized asphalt in road surface materials.
- N1.4: Promote the use of traffic calming measures where appropriate, such as narrow roadways and on street parking, in commercial and mixed-use districts.
- N1.5: Reduce noise impacts from vehicles, particularly in residential area through enforcement of speed limits on arterials and local roads.
- N1.6: Require compliance with State's Vehicle Code noise standards within the City.
- N1.7: Ensure the effective enforcement of City, State and Federal noise standards by all City Divisions.
- N1.8: Encourage walking, biking, carpooling, use of public transit and other alternative modes of transportation to minimize vehicular use and associated traffic noise.
- N1.9: Encourage, where feasible and reasonable, noise mitigation measures, such as noise barriers and realignments, in the design and construction of new roadway projects in Gardena.
- N1.10: Consider noise impacts to residential neighborhoods when designating truck routes and major circulation corridors.
- N1.11: Maintain bus routes that meet public transportation needs and minimize noise impacts in residential areas.
- N1.12: Encourage the Public Utilities Commission and Union Pacific to minimize the level of noise produced by train movements and horns within Gardena by reducing speeds, improving

vehicle system technology, and developing improved procedures for train engineer horn sounding.

N1.13: Encourage Gardena citizen participation and City involvement on committees that would influence future aircraft and railroad operations in Los Angeles County.

N1.14: Participate in the planning and impact assessment activities of the County Airport Land Use Commission and other regional or State agencies relative to any proposed expansion or change in flight patterns at the Hawthorne Municipal Airport or the Compton Airport.

N Goal 2: Incorporate noise considerations into land use planning decisions.

N2.1: Promote noise regulations that establish acceptable noise standards for various land uses throughout Gardena.

N2.2: Require noise/land use compatibility standards to guide future planning and development.

N2.3: Promote compliance with the State's noise insulation standards in the conversion of existing apartments into condominiums wherever feasible.

N2.4: Require mitigation of all significant noise impacts as a condition of project approval.

N2.5: Require proposed projects to be re-viewed for compatibility with nearby noise-sensitive land uses with the intent of reducing noise impacts.

N2.6: Require new residential developments located in proximity to existing commercial/industrial operations to control residential interior noise levels as a condition of approval and minimize exposure of residents in the site design.

N2.7: Require new commercial/industrial operations located in proximity to existing or proposed residential areas to incorporate noise mitigation into the project design.

N2.8: Require that mixed-use structures and areas be designed to prevent transfer of noise and vibration from commercial areas to residential areas.

N2.9: Encourage the creative use of site and building design techniques as a means to minimize noise impacts.

N2.10: Promote replacement of significant noise sources with non-noise-generating land uses when plans for future use of areas are developed.

N2.11: Require the County of Los Angeles, the City of Hawthorne, the City of Los Angeles, and the City of Torrance to minimize or avoid land use/noise conflicts prior to project approvals.

N Goal 3: Develop measures to control non-transportation noise impacts.

N3.1: Require compliance with a quantitative noise ordinance based on the Model Noise Ordinance developed by the (now-defunct) State of California Office of Noise Control.

N3.2: Require compliance with noise regulations. Review and update Gardena’s policies and regulations affecting noise.

N3.3: Require compliance with construction hours to minimize the impacts of construction noise on adjacent land.

N3.4: Require new equipment and vehicles purchased by the City to comply with noise performance standards consistent with available noise reduction technology.

N3.5: Require City departments to observe State and Federal occupational safety and health noise standards.

City of Gardena Municipal Code

Sections 8.36.040 and 8.36.050 of the City’s Noise Ordinance establish exterior and interior noise standards as it relates to that limit how loud project operation noise can be. The allowable exterior noise levels presented in Table 1 limit project operational noise at nearby land uses, and the allowable interior noise levels presented in Table 2 limit how loud project operational noise can be inside nearby residential and mixed-use structures. Subsection 8.36.040(C), states that in the event the ambient noise level exceeds the noise standard, the ambient noise level shall become the noise standard.

Table 1: Allowable Exterior Noise Level (dBA, Leq)

Type of Land Use	15-Minute Average Noise (dBA, Leq)		Maximum Noise Level (dBA, Lmax)	
	7 AM-10 PM	10 PM to 7 AM	7 AM-10 PM	10 PM to 7 AM
Residential	55	50	75	70
Residential portions of mixed use	60	50	80	70
Commercial	65	60	85	80
Industrial or manufacturing	70	70	90	90

Source: City of Gardena Municipal Code Section 8.36.040.

A. The exterior noise standards, unless otherwise specifically indicated, shall apply to all property within the City. The Land Use category refers to the affected receiver property. In the event the alleged offensive noise contains a pure tone such as a whine, screech, or hum, or contains repetitive, impulsive or impact noise such as hammering or riveting, or contains music or speech conveying informational content, each of the above noise standards shall be reduced by 5 dB.

B. No person shall operate or cause to be operated, any source of sound at any location within the incorporated City or allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person, which causes the noise level when measured from any other property, either incorporated or unincorporated, to exceed the noise standards presented in the above table.

C. In the event the ambient noise level exceeds the noise standard, the ambient noise level shall become the noise standard.

<Table 2, next page>

Table 2: Allowable Interior Noise Level (dBA, Leq)

Type of Land Use	15-Minute Average Noise (dBA, Leq)		Maximum Noise Level (dBA, Lmax)	
	7 AM-10 PM	10 PM to 7 AM	7 AM-10 PM	10 PM to 7 AM
Residential	45	40	65	60
Residential portions of mixed use	45	40	70	60

Source: City of Gardena Municipal Code Section 8.36.050.

A. The interior noise standards presented above, unless otherwise specifically indicated, shall apply to all residential dwellings with windows in their normal seasonal configuration, where such dwelling is the receiver of intrusive noise:
 In the event the alleged offensive noise contains a pure tone such as a whine, screech, or hum, or contains repetitive, impulsive or impact noise such as hammering or riveting, or contains music or speech conveying informational content, each of the above noise standards shall be reduced by 5 dB.

B. No person shall operate or cause to be operated, any source of sound at any location within the incorporated City or allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person, which causes the noise level when measured within any residential dwelling, either incorporated or unincorporated, to exceed the noise standards of paragraph (A).

C. In the event the ambient noise level exceeds the noise standard, the ambient noise level shall become the noise standard.

Construction Noise Regulations

Per Section 8.36.080 of the City’s Noise Ordinance, Project construction activities are explicitly exempt from the exterior and interior noise standards presented in Sections 8.36.040 and 8.36.050. Specifically, the ordinance states that “noise associated with construction, repair, remodeling, grading or demolition of any real property are exempt from the provisions in Chapter 8.36 (City of Gardena Noise Ordinance), provided said activities do not take place between the hours of 6:00 PM and 7:00 AM on weekdays between the hours of 6:00 PM and 9:00 AM on Saturday or any time on Sunday or a Federal holiday”.

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 the City of Gardena and the Caltrans technical noise specifications. 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
- During any short-term noise measurements, any noise contaminations such as barking dogs, local traffic, lawnmowers, or aircraft fly-overs were noted
- Temperature and sky conditions were observed and documented

5.2 Noise Measurement Location

The noise monitoring location was selected based on the distance from Rosecrans and Van Ness to the nearest sensitive on-site receptors. The long-term noise measurement was conducted near the adjacent residences and is illustrated in Exhibit E. 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 driveway). The model assumes that the site has sixty (60) parking spaces and 63 Trane air conditioning units.

Parking was modeled with a reference noise level of 0.72 cars per hour coming and going from the parking spots (per the peak hour of the trip generation divided by the number of parking spots). The rooftop unit was modeled as a line source with a sound power level of 74 dBA. 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 C.

Table 3: Reference Sound Level Measurements for SoundPLAN Model

Source	Source Type	Reference Level (dBA)	Descriptor
Parking	Area (SP Parking Tool)	-	1 movement per hr
Rooftop Units	Point Source	74	Sound Power

5.4 FHWA Traffic Noise Prediction Model/SoundPLAN

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 were obtained from the City. The 2018 counts were projected to the year 2022. The Project trip generation was used to obtain 2022 plus Project volumes. The referenced traffic data was applied to the model and is in Appendix B. The following outlines the key adjustments made to the REMEL for the roadway inputs:

- Roadway classification – (e.g. freeway, major arterial, arterial, secondary, collector, etc),
- Roadway Active Width – (distance between the center of the outermost travel lanes on each side of the roadway)
- Average Daily Traffic Volumes (ADT), Travel Speeds, Percentages of automobiles, medium trucks, and heavy trucks
- Roadway grade and angle of view
- Site Conditions (e.g. soft vs. hard)
- Percentage of total ADT which flows each hour throughout a 24-hour period

Table 4 indicates the roadway parameters and vehicle distribution utilized for this study.

<Table 4, next page>

Table 4: Roadway Parameters and Vehicle Distribution

Roadway	Type	2022 ADT ¹	2022 + Project ADT ²	Speed (MPH)	Site Conditions
Van Ness Ave.	Arterial	22,515	22,635	35	Hard
Rosecrans Ave.	Major Collector	38,524	38,644	40	Hard
Vehicle Distribution and Mix ³					
Motor-Vehicle Type		Daytime % (7 AM to 7 PM)	Evening % (7 PM to 10 PM)	Night % (10 PM to 7 AM)	Total % of Traffic Flow
Automobiles		77.5	12.9	9.6	97.42
Medium Trucks		84.8	4.9	10.3	1.54
Heavy Trucks		86.5	2.7	10.8	0.74
Notes:					
¹ Existing ADT volumes for are from the City's 2018 traffic counts.					
² E+P estimated with a 2% growth rate factor.					
³ Vehicle distribution data is based on typical Southern California roadway vehicle percentages.					

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

In addition, this assessment calculates future traffic noise levels at the project site associated with Rosecrans and Van Ness. For the purpose of this evaluation, MD used the existing + project to represent the future noise level to the office/retail building. The traffic noise calculation worksheet outputs are located in Appendix B.

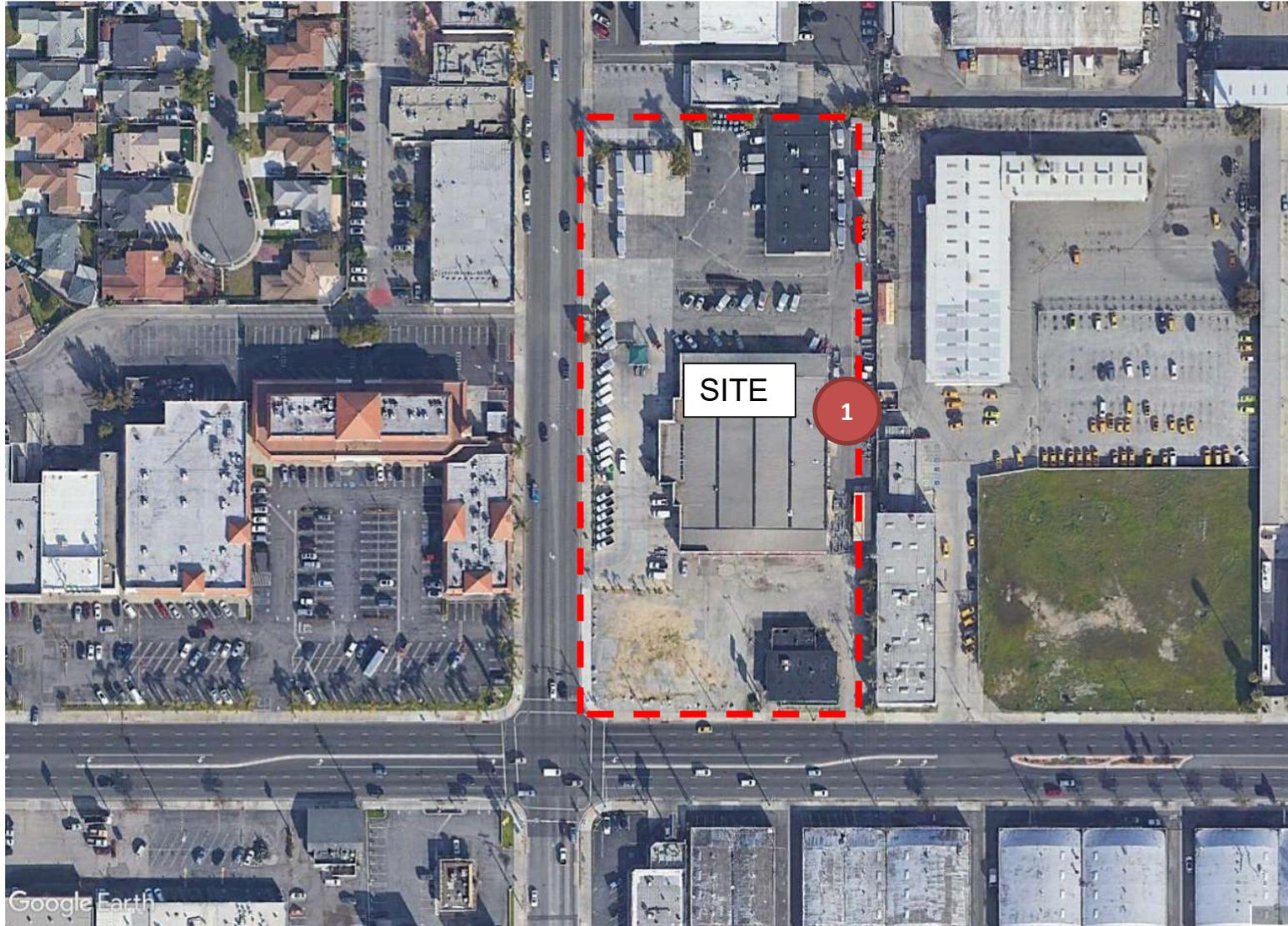
5.5 Interior Noise Modeling

The interior noise level is the difference between the projected exterior noise level at the structure’s facade and the noise reduction provided by the structure itself. Typical building construction will provide a conservative 12 dBA noise level reduction with a “windows open” condition and a very conservative 20 dBA noise level reduction with “windows closed”. MD estimated the interior noise level by subtracting the building shell design from the predicted exterior noise level.

5.6 FHWA Roadway Construction Noise Model

The construction noise analysis utilizes the Federal Highway Administration (FHWA) Roadway Construction Noise Model (RNCM), together with several key construction parameters. Key inputs include distance to the sensitive receiver, equipment usage, % usage factor, and baseline parameters for the project site. The project was analyzed based on the different construction phases. The construction noise calculation output worksheet is located in Appendix D.

Exhibit E Measurement Location



-  = Measurement location
-  = boundary

6.0 Existing Noise Environment

A twenty-four (24) hour ambient noise measurement was conducted at the Project site. The measurement location is in Exhibit E. The measurement measured the 1-hour Leq, Lmin, Lmax, and other statistical data (e.g. L2, L8). The noise measurement was taken to determine the existing baseline noise conditions.

6.1 Long-Term Noise Measurement Results

The results of the Long-term noise data taken are presented in Table 5.

Table 5: Long-Term Noise Measurement Data (dBA)^{1,2}

Date	Time	1-hour dB(A)						
		Leq	Lmax	Lmin	L(2)	L(8)	L(25)	L(50)
6/3/2021	5PM-6PM	58.0	75.4	50.2	61.5	60.0	59.6	57.5
6/3/2021	6PM-7PM	58.1	75.5	48.8	62.7	61.8	60.8	56.4
6/3/2021	7PM-8PM	57.4	76.1	47.4	66.1	59.9	58.6	55.7
6/3/2021	8PM-9PM	54.7	63.5	50.4	60.8	59.1	56.2	53.8
6/3/2021	9PM-10PM	54.0	70.1	47.5	56.3	56.1	55.6	54.0
6/3/2021	10PM-11PM	53.6	63.9	48.8	56.3	56.1	55.5	53.1
6/3/2021	11PM-12AM	53.2	63.6	48.4	56.1	55.8	55.4	52.4
6/4/2021	12AM-1AM	53.2	69.3	47.7	57.4	55.9	55.7	52.1
6/4/2021	1AM-2AM	52.4	64.6	46.8	55.5	55.1	55.0	51.0
6/4/2021	2AM-3AM	52.7	57.2	45.1	54.8	54.7	54.5	53.9
6/4/2021	3AM-4AM	50.3	61.4	44.4	54.7	54.5	54.5	48.1
6/4/2021	4AM-5AM	49.1	64.8	44.4	54.5	50.9	50.4	48.1
6/4/2021	5AM-6AM	51.3	77.6	45.7	56.3	53.3	52.3	50.3
6/4/2021	6AM-7AM	54.5	75.4	47.4	58.3	57.6	57.0	53.8
6/4/2021	7AM-8AM	57.9	71.9	48.6	61.7	60.6	59.8	57.7
6/4/2021	8AM-9AM	62.5	84.2	51.5	70.7	66.7	64.2	58.7
6/4/2021	9AM-10AM	65.5	85.5	51.0	73.8	73.6	71.0	61.0
6/4/2021	10AM-11AM	62.5	78.3	53.5	68.7	68.3	67.0	59.7
6/4/2021	11AM-12PM	59.5	81.7	53.6	63.9	63.0	60.8	58.5
6/4/2021	12PM-1PM	60.2	76.0	54.1	66.8	65.0	63.1	58.3
6/4/2021	1PM-2PM	61.9	82.7	52.4	69.4	68.4	65.8	58.4
6/4/2021	2PM-3PM	58.4	74.5	54.0	62.0	60.6	59.8	58.0
6/4/2021	3PM-4PM	58.8	76.9	53.6	64.0	61.6	60.2	57.9
6/4/2021	4PM-5PM	57.6	73.4	47.4	62.6	60.0	59.2	56.6
CNEL		61.5						
Notes:								
1. Long-term noise monitoring location LT1 is illustrated in Exhibit E.								
2. Quietest hour during operational hours is highlighted in orange.								

Noise data indicates the ambient hourly level ranged between 57.4 dBA to 65.5 dBA Leq on the Project site during operational hours. Operational hours vary depending on the day of the week. Friday has the longest operational hours from 7 AM to 8 PM. The measured CNEL at the Project site was 61.5 dBA CNEL. Additional field notes and photographs are provided in Appendix A.

For this evaluation, MD utilized the quietest hourly ambient noise level and has compared the Project's projected noise levels to the quietest hourly ambient. The quietest (lowest) hourly level during Friday operational hours occurred from 7 PM to 8 PM (57.4 dBA, Leq (h)).

7.0 Future Noise Environment Impacts and Mitigation

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

7.1 Future Exterior Noise

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

7.1.1 Off-site Traffic Noise Impact

The potential off-site noise impacts caused by the increase in vehicular traffic as a result of the project were calculated at a distance of 50 feet. The distance to the 55, 60, 65, and 70 dBA CNEL noise contours are also provided in Appendix B for reference. The noise levels and contours were calculated for 2022 without Project and 2022 with Project. The CNEL levels will increase less than 0.1 dBA on Rosecrans and Van Ness as a result of the project. This will be inaudible and therefore the impact is less than significant, and no mitigation is required.

7.1.2 On-Site Traffic Noise Impact

Traffic noise from the local roadway network was evaluated and compared to the City’s Land Use Compatibility Guidelines (Exhibit D). Commercial uses are conditionally acceptable up to 80 dBA CNEL and offices are conditionally acceptable up to 75 dBA CNEL. Levels at the office building are 71.7 dBA CNEL. The peak hourly level at the office building is projected to be 72 dBA Leq. Standard building construction for the office area, with standard STC windows and glass doors, will result in an interior level of 50 dBA Leq. The impact is therefore less than significant, and no mitigation is required.

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

Sensitive receptors that may be affected by project operational noise include adjacent residences to the east. The worst-case stationary noise was modeled using SoundPLAN acoustical modeling software. The model utilizes a reference level of 74 dBA for the sound power for the air conditioning unit and parking lot movements based on the peak hour trip generation for the Project.

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

Project Operational Noise Levels

Exhibit F shows the “Project-only” operational noise levels at the property lines and/or sensitive receptor area and how the noise will propagate at the site. Operational noise levels at the adjacent uses are anticipated to range between 38 dBA to 45 dBA Leq (depending on the location).

The “Project-only” noise projections to the adjacent uses are below the City’s 60 dBA mixed-use residential limit, as outlined within the City’s noise ordinance (see Table 1).

Project Plus Ambient Operational Noise Levels

As shown in Table 6, project plus ambient noise level projections are anticipated to be 57 dBA Leq at receptors (R1 – R4).

Table 6: Worst-case Predicted Operational Leq Noise Level

Receptor ¹	Floor	Existing Ambient Noise Level (dBA, Leq) ²	Project Noise Level (dBA, Leq) ³	Total Combined Noise Level (dBA, Leq)	Daytime (7 AM - 10 PM) Stationary Noise Limit (dBA, Leq)	Change in Noise Level as Result of Project
R1	1	57	43	57	65	0
R2	1		38	57	65	0
R3	1		45	57	60	0
	2		45	57	60	0
	3		44	57	60	0
R4	1		44	57	65	0

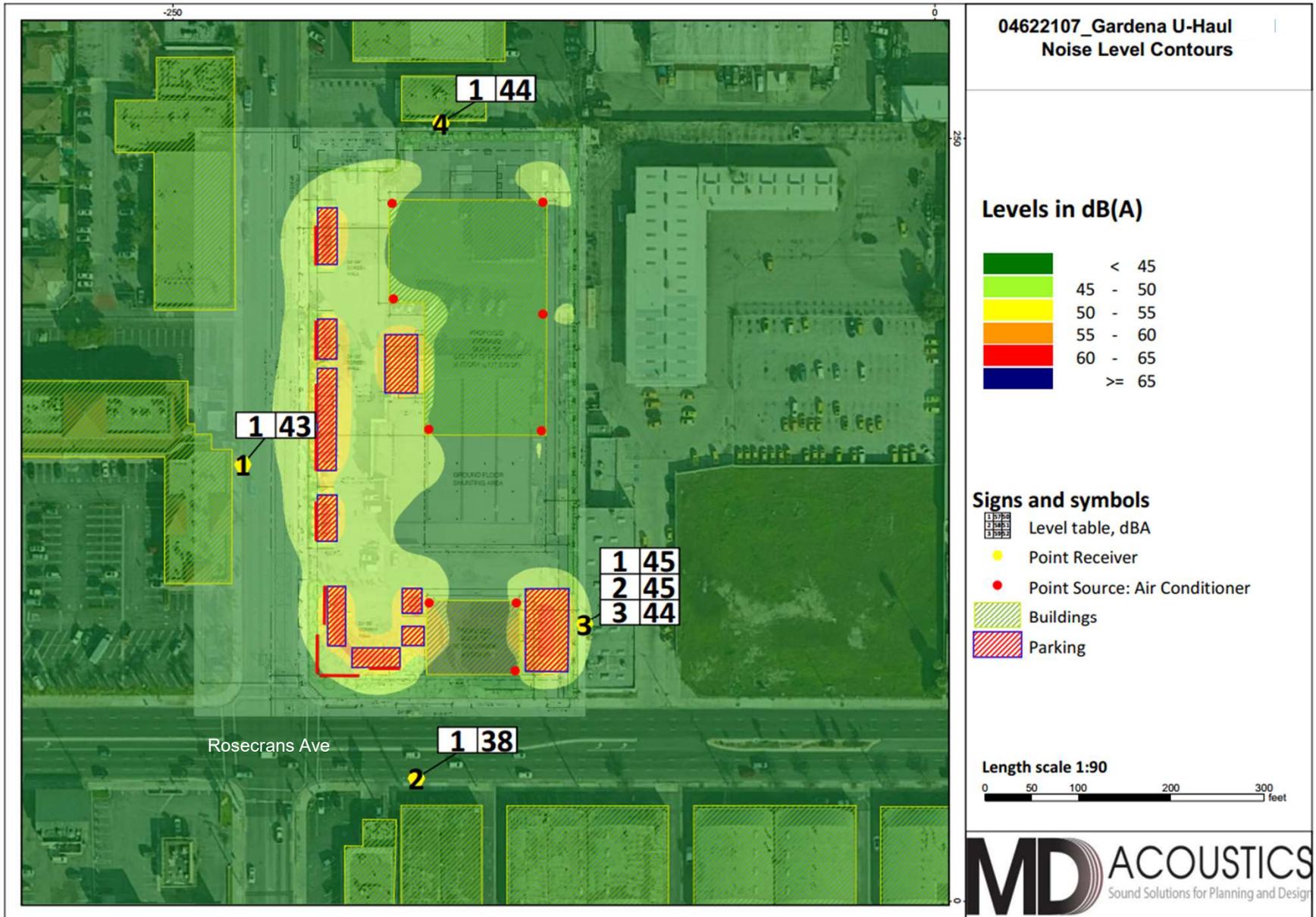
Notes:
¹ Receptors R1, R2, and R4 represent commercial uses. R3 represents residential use.
² Existing measured ambient condition
³ See Exhibit F for the operational noise level projections at said receptors.

As shown in Table 6, the project will increase the worst-case noise level by less than one dB at receptors R1-R4. As discussed in Section 2.5 of this report, an increase of 1 dB is not perceptible.

As a conservative measure, MD has compared the worst-case operational daytime noise levels with the lowest measured ambient levels during operational hours. The total combined noise level is below the 60 dBA mixed-use residential daytime noise limit and the 65 dBA commercial daytime noise limit. Therefore, the project complies with all local noise regulations.

The interior noise level at the adjacent residential properties is projected to be 40 dBA, Leq during operational hours which is below the 45 dBA daytime residential mixed-use limit.

Worst Case Operational Noise Levels



8.0 Construction Noise Impact

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

8.1 Construction Noise

The Environmental Protection Agency (EPA) has compiled data regarding the noise-generated characteristics of typical construction activities. The data is presented in Table 7.

Table 7: Typical Construction Noise Levels¹

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

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. Construction equipment was obtained from the air quality study CalEEMod. Construction noise was projected from the center of the site to represent an average of equipment moving around the site. Table 8 provides the average construction noise levels at the nearest sensitive receptor, the adjacent residences to the east of the project site.

Table 8: Average Construction Noise Level by Phase (dBA)

Activity	Leq at 160 Feet (East Residences)
Site Preparation	79
Demolition	77
Grading	77
Building Construction	77
Paving	78
Architectural Coating	67

A single bulldozer 25 ft away from the eastern residential buildings (running adjacent to the property line) would have an Lmax level of 91 dBA. This maximum level will only occur during the short periods when equipment is operating along the property line.

Construction operations must follow section 8.36.080 of the municipal code which states that construction, repair, or excavation work performed must not take place between the hours of 6:00 PM and 7:00 AM on weekdays between the hours of 6:00 PM and 9:00 AM on Saturday or any time on Sunday or a Federal holiday. When construction activities are taken within allowable times, the construction noise impact is considered less than significant, and no mitigation is required. However, the following best management practices are recommended to further induce noise levels associated with construction activities:

1. During construction, the contractor should ensure all construction equipment is equipped with appropriate noise attenuating devices.
2. 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.
3. Idling equipment should be turned off when not in use.
4. Equipment should be maintained so that vehicles and their loads are secured from rattling and banging.

Construction is anticipated to occur during the permissible hours according to the City’s Municipal Code. 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. The construction noise impact is considered less than significant, and no mitigation is required.

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.

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

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

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

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

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

The thresholds from the Caltrans Transportation and Construction Induced Vibration Guidance Manual in Table 9 (below) provide general thresholds and guidelines as to the vibration damage potential from vibratory impacts.

Table 9: 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 10 gives approximate vibration levels for particular construction activities. This data provides a reasonable estimate for a wide range of soil conditions.

Table 10: Vibration Source Levels for Construction Equipment¹

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

Equipment	Peak Particle Velocity (inches/second) at 25 feet	Approximate Vibration Level LV (dVB) at 25 feet
Hoe Ram	0.089	87
Large bulldozer	0.089	87
Caisson drill	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

¹ Source: Transit Noise and Vibration Impact Assessment, Federal Transit Administration, May 2006.

The nearest residential structures to the east are approximately 25 feet from construction activities. At a distance of 25 feet, a large bulldozer would yield a worst-case 0.089 PPV (in/sec) which is perceptible but sustainably below any risk of damage. The impact is less than significant, and no mitigation is required.

9.0 *References*

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

City of Gardena: Noise Element.

City of Gardena: Noise Ordinance.

Caltrans Construction Vibration Manual, Konan Vibration Criteria

Federal Transit Administration Traffic Noise and Vibration Manual. 2018.

Federal Highway Administration: Roadway Noise Construction Model. 2006.

Federal Highway Administration: Traffic Noise Model

Appendix A:
Field Measurement Data

24-Hour Continuous Noise Measurement Datasheet

Project: Uhaul Redevelopment project
Site Address/Location: 14202 Van Ness, Gardena CA
Date: 06/03/2021-06/05/2021
Field Tech/Engineer: Jason Schuyler & Claire Pincock

Site Observations: Clear Skys temps in the 80' during the day high 50's at night.
 Primary noise source is Rosecrans Ave.

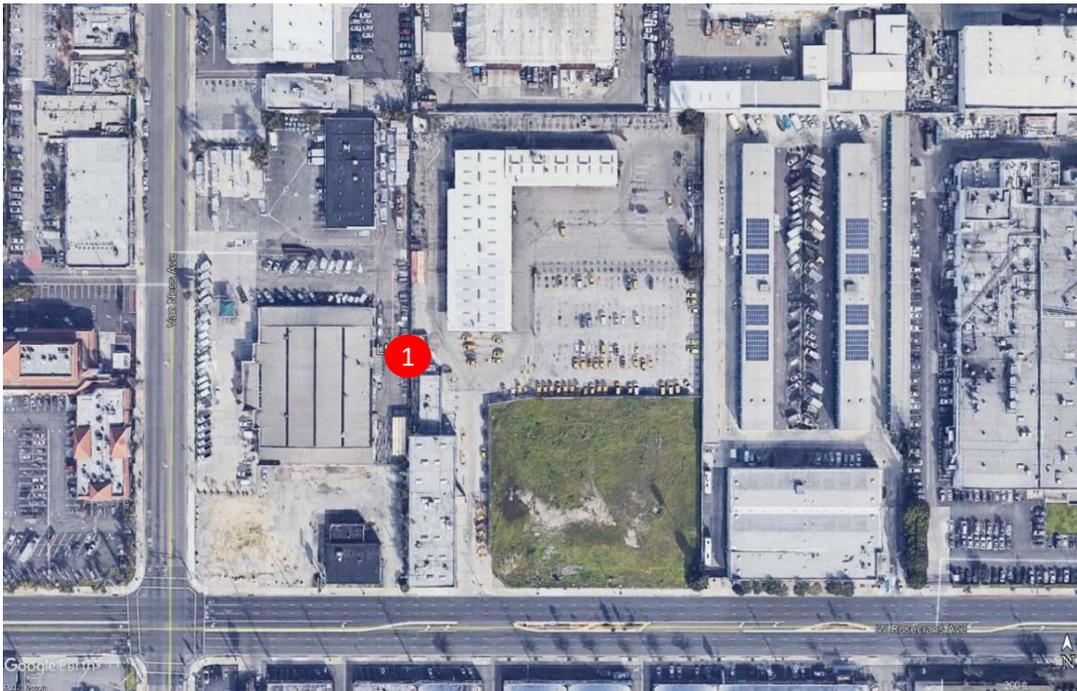
General Location:
Sound Meter: Piccolo 2 SN: 80206
Settings: A-weighted, slow, 1-min, 24-hour duration
Meteorological Con.: 2 to 5 mph wind from W. no rain
Site ID: LT-1

Site Topo: Flat
Ground Type: Hard site buildings walls and Asvaul

Noise Source(s) w/ Distance:

Meter is 3' from E. P/L

Figure 1: LT-1 Monitoring Location



24-Hour Noise Measurement Datasheet - Cont.

Project: Haul Redevelopment project **Day:** 1 of 1
Site Address/Location: 14202 Van Ness, Gardena CA
Site ID: LT-1

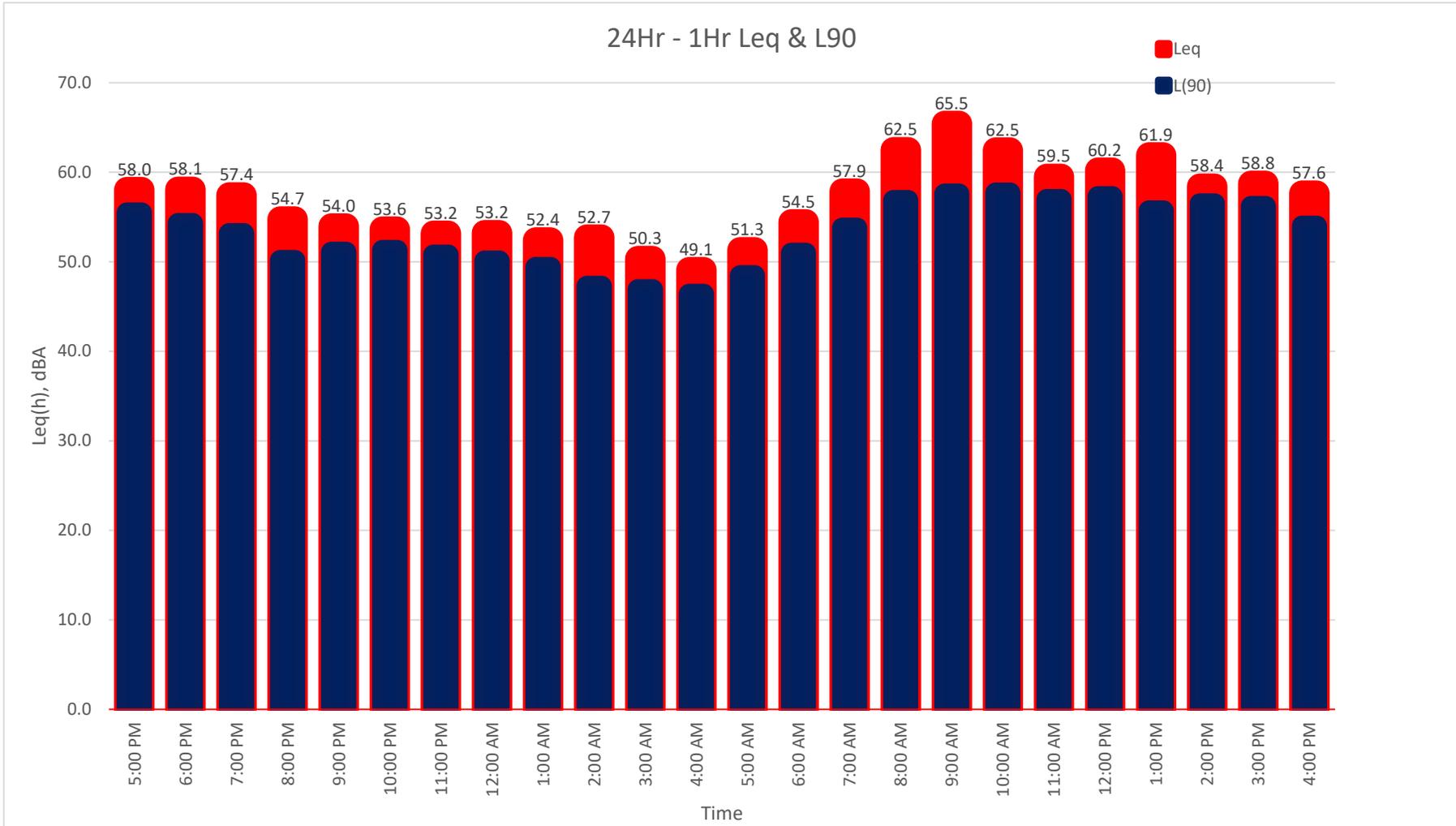
Date	Start	Stop	Leq	Lmax	Lmin	L2	L8	L25	L50	L90
6/3/2021	5:00 PM	6:00 PM	58.0	75.4	50.2	61.5	60.0	59.6	57.5	55.5
6/3/2021	6:00 PM	7:00 PM	58.1	75.5	48.8	62.7	61.8	60.8	56.4	54.3
6/3/2021	7:00 PM	8:00 PM	57.4	76.1	47.4	66.1	59.9	58.6	55.7	53.2
6/3/2021	8:00 PM	9:00 PM	54.7	63.5	50.4	60.8	59.1	56.2	53.8	50.2
6/3/2021	9:00 PM	10:00 PM	54.0	70.1	47.5	56.3	56.1	55.6	54.0	51.1
6/3/2021	10:00 PM	11:00 PM	53.6	63.9	48.8	56.3	56.1	55.5	53.1	51.3
6/3/2021	11:00 PM	12:00 AM	53.2	63.6	48.4	56.1	55.8	55.4	52.4	50.8
6/3/2021	12:00 AM	1:00 AM	53.2	69.3	47.7	57.4	55.9	55.7	52.1	50.1
6/3/2021	1:00 AM	2:00 AM	52.4	64.6	46.8	55.5	55.1	55.0	51.0	49.4
6/3/2021	2:00 AM	3:00 AM	52.7	57.2	45.1	54.8	54.7	54.5	53.9	47.3
6/3/2021	3:00 AM	4:00 AM	50.3	61.4	44.4	54.7	54.5	54.5	48.1	46.9
6/3/2021	4:00 AM	5:00 AM	49.1	64.8	44.4	54.5	50.9	50.4	48.1	46.4
6/3/2021	5:00 AM	6:00 AM	51.3	77.6	45.7	56.3	53.3	52.3	50.3	48.5
6/4/2021	6:00 AM	7:00 AM	54.5	75.4	47.4	58.3	57.6	57.0	53.8	51.0
6/4/2021	7:00 AM	8:00 AM	57.9	71.9	48.6	61.7	60.6	59.8	57.7	53.8
6/4/2021	8:00 AM	9:00 AM	62.5	84.2	51.5	70.7	66.7	64.2	58.7	56.9
6/4/2021	9:00 AM	10:00 AM	65.5	85.5	51.0	73.8	73.6	71.0	61.0	57.6
6/4/2021	10:00 AM	11:00 AM	62.5	78.3	53.5	68.7	68.3	67.0	59.7	57.7
6/4/2021	11:00 AM	12:00 PM	59.5	81.7	53.6	63.9	63.0	60.8	58.5	57.0
6/4/2021	12:00 PM	1:00 PM	60.2	76.0	54.1	66.8	65.0	63.1	58.3	57.3
6/4/2021	1:00 PM	2:00 PM	61.9	82.7	52.4	69.4	68.4	65.8	58.4	55.7
6/4/2021	2:00 PM	3:00 PM	58.4	74.5	54.0	62.0	60.6	59.8	58.0	56.5
6/4/2021	3:00 PM	4:00 PM	58.8	76.9	53.6	64.0	61.6	60.2	57.9	56.2
6/4/2021	4:00 PM	5:00 PM	57.6	73.4	47.4	62.6	60.0	59.2	56.6	54.0

CNEL: 61.5

24-Hour Continuous Noise Measurement Datasheet - Cont.

Project: Uhaul Redevelopment project
Site Address/Location: 14202 Van Ness, Gardena CA
Site ID: LT-1

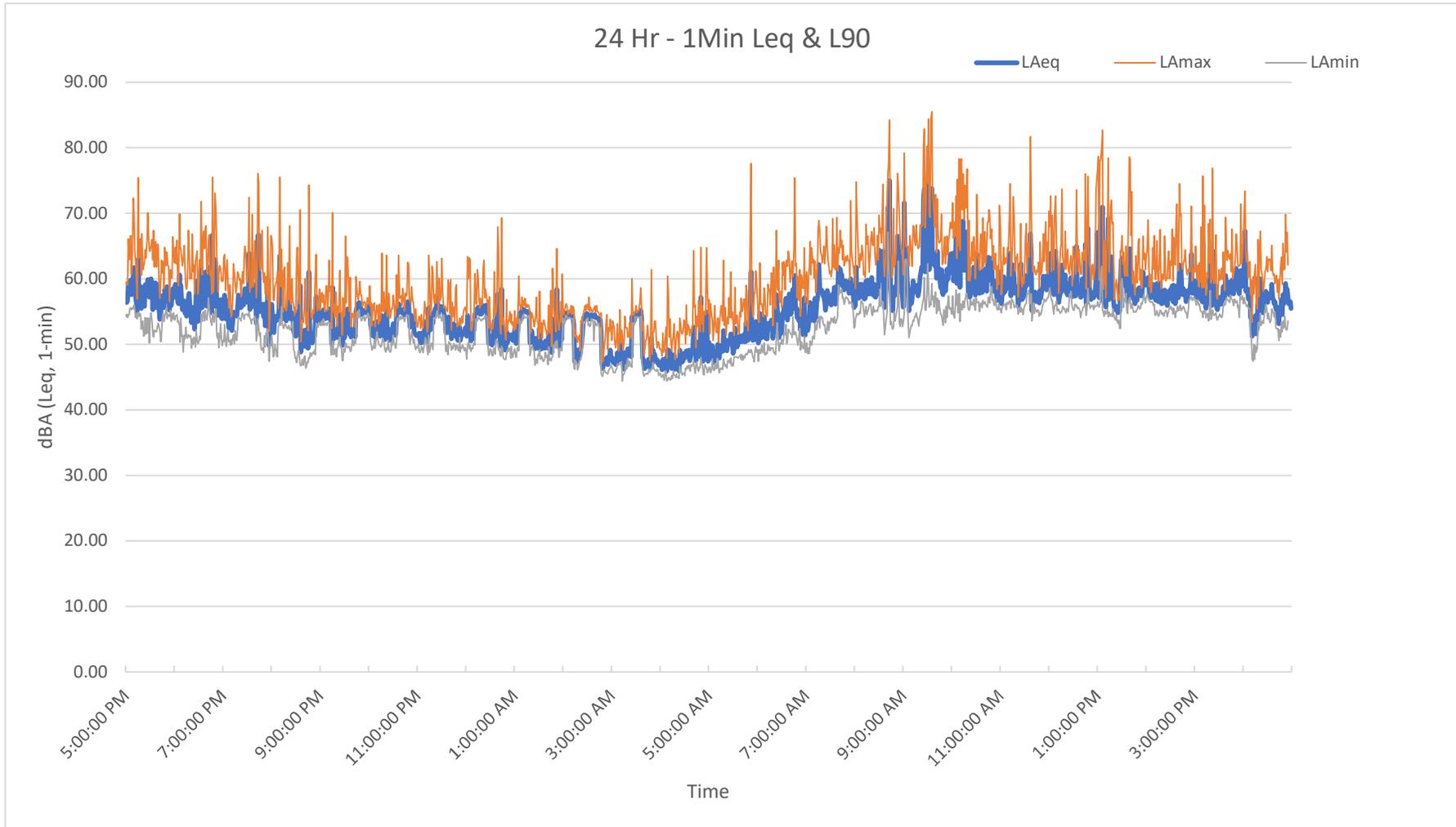
Day: 1 of 1



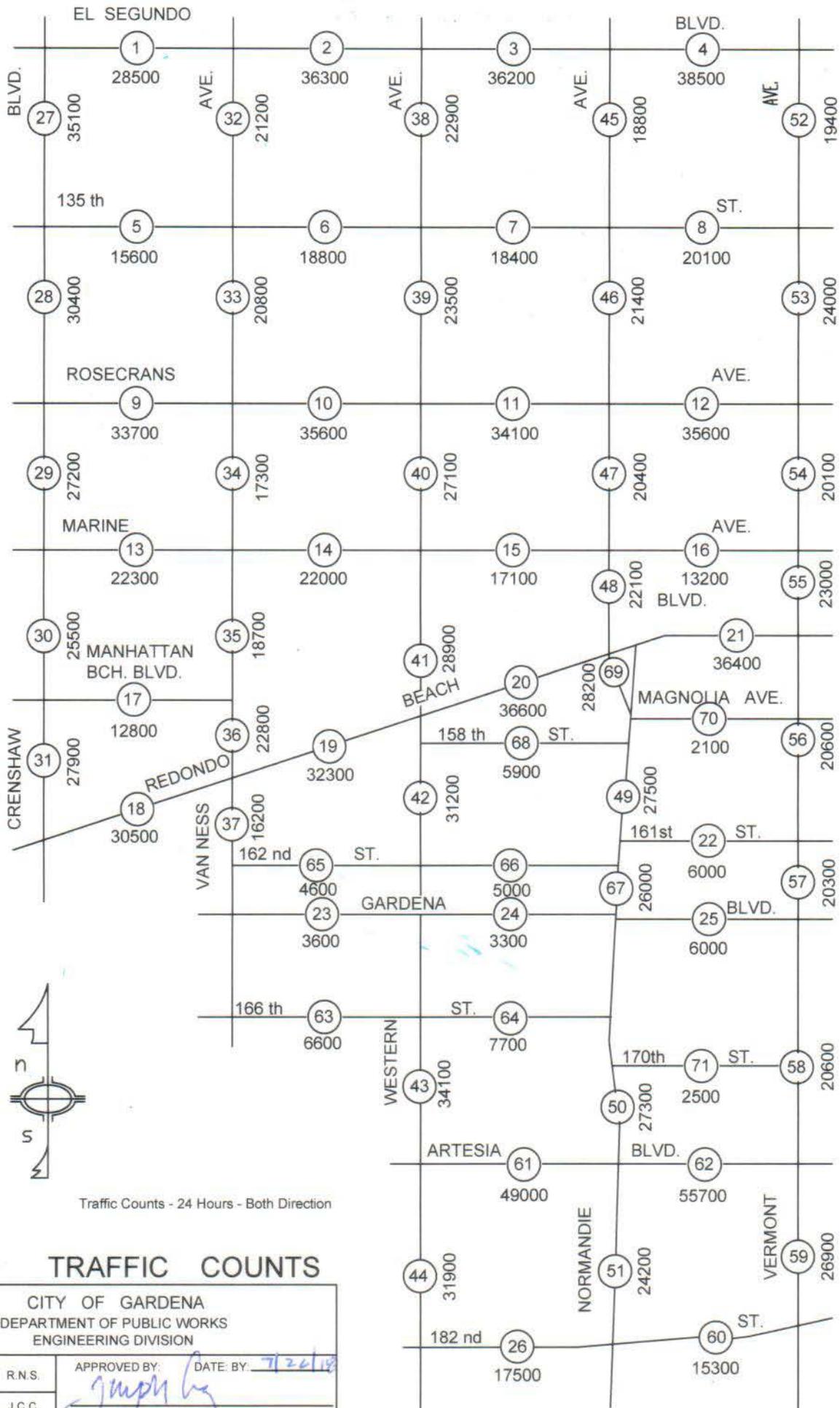
24-Hour Continuous Noise Measurement Datasheet - Cont.

Project: Uhaul Redevelopment project
Site Address/Location: 14202 Van Ness, Gardena CA
Site ID: LT-1

Day: 1 of 1



Appendix B:
Traffic Data



Traffic Counts - 24 Hours - Both Direction

2018 TRAFFIC COUNTS

CITY OF GARDENA
DEPARTMENT OF PUBLIC WORKS
ENGINEERING DIVISION

DRAWN BY:

R.N.S.

APPROVED BY:

DATE BY: 7/26/18

CHECKED BY:

J.C.C.

Joseph G.

Trip Generation Rates								
Land Use	Rate	Daily	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Mini-Warehouse (ITE Code 151)	per KSF	1.51	60%	40%	0.10	47%	53%	0.17
General Office Building (ITE Code 710)	per KSF	9.74	86%	14%	1.16	16%	84%	1.15
Building Materials and Lumber Store (ITE Code 812)	per KSF	18.05	63%	37%	1.57	47%	53%	2.06

Trip Generation Estimates								
Land Use	Size	Daily	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
<u>Existing Uses</u>								
Mini-Warehouse (ITE Code 151)	23.536 KSF	36	1	1	2	2	2	4
General Office Building (ITE Code 710)	15.981 KSF	156	16	3	19	3	15	18
Building Materials and Lumber Store (ITE Code 812)	3.750 KSF	68	4	2	6	4	4	8
TOTAL - EXISTING USES		260	21	6	27	9	21	30
<u>Proposed Uses</u>								
Mini-Warehouse (ITE Code 151)	177.573 KSF	268	11	7	18	14	16	30
General Office Building (ITE Code 710)	3.820 KSF	37	3	1	4	1	3	4
Building Materials and Lumber Store (ITE Code 812)	4.180 KSF	75	4	3	7	4	5	9
TOTAL PROJECT TRIPS		380	18	11	29	19	24	43
NET NEW PROJECT TRIPS		120	-3	5	2	10	3	13

Source: Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition

Notes:

KSF - thousand square feet

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

PROJECT: Gardena U-Haul Redevelopment	JOB #: 1922-06-02
ROADWAY: Rosecrans 2022	DATE: 22-Oct-21
LOCATION: 50 from CL	ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS	RECEIVER INPUT DATA
ADT = 38,524	RECEIVER DISTANCE = 50
SPEED = 40	DIST C/L TO WALL = 10
PK HR % = 10	RECEIVER HEIGHT = 5.0
NEAR LANE/FAR LANE DIS = 65	WALL DISTANCE FROM RECEIVER = 40
ROAD ELEVATION = 0.0	PAD ELEVATION = 0.0
GRADE = 1.0 %	ROADWAY VIEW: LF ANGLE= -90
PK HR VOL = 3,852	RT ANGLE= 90
	DF ANGLE= 180

SITE CONDITIONS	WALL INFORMATION
AUTOMOBILES = 10	HTH WALL = 0.0
MEDIUM TRUCKS = 10 (10 = HARD SITE, 15 = SOFT SITE)	AMBIENT= 0.0
HEAVY TRUCKS = 10	BARRIER = 0 (0 = WALL, 1 = BERM)

VEHICLE MIX DATA	MISC. VEHICLE INFO			
VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.9742
MEDIUM TRUCK	0.848	0.049	0.103	0.0184
HEAVY TRUCKS	0.865	0.027	0.108	0.0074
VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT	
AUTOMOBILES	2.0	38.11	--	
MEDIUM TRUCKS	4.0	38.01	--	
HEAVY TRUCKS	8.0	38.12	0.00	

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	72.9	71.0	69.2	63.2	71.8	72.4
MEDIUM TRUCKS	64.6	63.1	56.7	55.2	63.7	63.9
HEAVY TRUCKS	65.5	64.1	55.0	56.3	64.6	64.8
NOISE LEVELS (dBA)	74.1	72.3	69.6	64.5	73.1	73.6

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	72.9	71.0	69.2	63.2	71.8	72.4
MEDIUM TRUCKS	64.6	63.1	56.7	55.2	63.7	63.9
HEAVY TRUCKS	65.5	64.1	55.0	56.3	64.6	64.8
NOISE LEVELS (dBA)	74.1	72.3	69.6	64.5	73.1	73.6

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	114	361	1140	3606
LDN	102	322	1017	3215

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

PROJECT: Gardena U-Haul Redevelopment	JOB #: 1922-06-02
ROADWAY: Rosecrans 2022+P	DATE: 22-Oct-21
LOCATION: 50 from CL	ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS	RECEIVER INPUT DATA
ADT = 38,644	RECEIVER DISTANCE = 50
SPEED = 40	DIST C/L TO WALL = 10
PK HR % = 10	RECEIVER HEIGHT = 5.0
NEAR LANE/FAR LANE DIS = 54	WALL DISTANCE FROM RECEIVER = 40
ROAD ELEVATION = 0.0	PAD ELEVATION = 0.0
GRADE = 1.0 %	ROADWAY VIEW: LF ANGLE= -90
PK HR VOL = 3,864	RT ANGLE= 90
	DF ANGLE= 180

SITE CONDITIONS	WALL INFORMATION
AUTOMOBILES = 10	HTH WALL = 0.0
MEDIUM TRUCKS = 10 (10 = HARD SITE, 15 = SOFT SITE)	AMBIENT= 0.0
HEAVY TRUCKS = 10	BARRIER = 0 (0 = WALL, 1 = BERM)

VEHICLE MIX DATA	MISC. VEHICLE INFO			
VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.9742
MEDIUM TRUCK	0.848	0.049	0.103	0.0184
HEAVY TRUCKS	0.865	0.027	0.108	0.0074
VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT	
AUTOMOBILES	2.0	42.19	--	
MEDIUM TRUCKS	4.0	42.10	--	
HEAVY TRUCKS	8.0	42.19	0.00	

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	72.5	70.6	68.8	62.7	71.4	72.0
MEDIUM TRUCKS	64.2	62.7	56.3	54.8	63.2	63.5
HEAVY TRUCKS	65.1	63.6	54.6	55.9	64.2	64.3
NOISE LEVELS (dBA)	73.7	71.9	69.2	64.1	72.7	73.2

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	72.5	70.6	68.8	62.7	71.4	72.0
MEDIUM TRUCKS	64.2	62.7	56.3	54.8	63.2	63.5
HEAVY TRUCKS	65.1	63.6	54.6	55.9	64.2	64.3
NOISE LEVELS (dBA)	73.7	71.9	69.2	64.1	72.7	73.2

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	103	327	1033	3268
LDN	92	291	921	2913

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

PROJECT: Gardena U-Haul Redevelopment	JOB #: 1922-06-02
ROADWAY: Van Ness 2022	DATE: 22-Oct-21
LOCATION: 50 from CL	ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS	RECEIVER INPUT DATA
ADT = 22,515	RECEIVER DISTANCE = 50
SPEED = 35	DIST C/L TO WALL = 10
PK HR % = 10	RECEIVER HEIGHT = 5.0
NEAR LANE/FAR LANE DIS = 45	WALL DISTANCE FROM RECEIVER = 40
ROAD ELEVATION = 0.0	PAD ELEVATION = 0.0
GRADE = 1.0 %	ROADWAY VIEW: LF ANGLE= -90
PK HR VOL = 2,252	RT ANGLE= 90
	DF ANGLE= 180

SITE CONDITIONS	WALL INFORMATION
AUTOMOBILES = 10	HTH WALL = 0.0
MEDIUM TRUCKS = 10 (10 = HARD SITE, 15 = SOFT SITE)	AMBIENT= 0.0
HEAVY TRUCKS = 10	BARRIER = 0 (0 = WALL, 1 = BERM)

VEHICLE MIX DATA	MISC. VEHICLE INFO			
VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY
AUTOMOBILES	0.775	0.129	0.096	0.9742
MEDIUM TRUCK	0.848	0.049	0.103	0.0184
HEAVY TRUCKS	0.865	0.027	0.108	0.0074
VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT	
AUTOMOBILES	2.0	44.75	--	
MEDIUM TRUCKS	4.0	44.66	--	
HEAVY TRUCKS	8.0	44.75	0.00	

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	68.2	66.3	64.5	58.5	67.1	67.7
MEDIUM TRUCKS	60.7	59.2	52.8	51.3	59.7	60.0
HEAVY TRUCKS	61.9	60.5	51.5	52.7	61.1	61.2
NOISE LEVELS (dBA)	69.7	67.9	65.0	60.1	68.7	69.1

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	68.2	66.3	64.5	58.5	67.1	67.7
MEDIUM TRUCKS	60.7	59.2	52.8	51.3	59.7	60.0
HEAVY TRUCKS	61.9	60.5	51.5	52.7	61.1	61.2
NOISE LEVELS (dBA)	69.7	67.9	65.0	60.1	68.7	69.1

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	41	130	410	1295
LDN	37	116	367	1160

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

PROJECT: Gardena U-Haul Redevelopment	JOB #: 1922-06-02
ROADWAY: Rosecrans 2022+P	DATE: 22-Oct-21
LOCATION: 50 from CL	ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS	RECEIVER INPUT DATA
ADT = 22,635	RECEIVER DISTANCE = 50
SPEED = 35	DIST C/L TO WALL = 10
PK HR % = 10	RECEIVER HEIGHT = 5.0
NEAR LANE/FAR LANE DIS = 45	WALL DISTANCE FROM RECEIVER = 40
ROAD ELEVATION = 0.0	PAD ELEVATION = 0.0
GRADE = 1.0 %	ROADWAY VIEW: LF ANGLE= -90
PK HR VOL = 2,264	RT ANGLE= 90
	DF ANGLE= 180

SITE CONDITIONS	WALL INFORMATION
AUTOMOBILES = 10	HTH WALL = 0.0
MEDIUM TRUCKS = 10 (10 = HARD SITE, 15 = SOFT SITE)	AMBIENT= 0.0
HEAVY TRUCKS = 10	BARRIER = 0 (0 = WALL, 1 = BERM)

VEHICLE MIX DATA	MISC. VEHICLE INFO																																				
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>VEHICLE TYPE</th> <th>DAY</th> <th>EVENING</th> <th>NIGHT</th> <th>DAILY</th> </tr> </thead> <tbody> <tr> <td>AUTOMOBILES</td> <td align="center">0.775</td> <td align="center">0.129</td> <td align="center">0.096</td> <td align="center">0.9742</td> </tr> <tr> <td>MEDIUM TRUCK</td> <td align="center">0.848</td> <td align="center">0.049</td> <td align="center">0.103</td> <td align="center">0.0184</td> </tr> <tr> <td>HEAVY TRUCKS</td> <td align="center">0.865</td> <td align="center">0.027</td> <td align="center">0.108</td> <td align="center">0.0074</td> </tr> </tbody> </table>	VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY	AUTOMOBILES	0.775	0.129	0.096	0.9742	MEDIUM TRUCK	0.848	0.049	0.103	0.0184	HEAVY TRUCKS	0.865	0.027	0.108	0.0074	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>VEHICLE TYPE</th> <th>HEIGHT</th> <th>SLE DISTANCE</th> <th>GRADE ADJUSTMENT</th> </tr> </thead> <tbody> <tr> <td>AUTOMOBILES</td> <td align="center">2.0</td> <td align="center">44.75</td> <td align="center">--</td> </tr> <tr> <td>MEDIUM TRUCKS</td> <td align="center">4.0</td> <td align="center">44.66</td> <td align="center">--</td> </tr> <tr> <td>HEAVY TRUCKS</td> <td align="center">8.0</td> <td align="center">44.75</td> <td align="center">0.00</td> </tr> </tbody> </table>	VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT	AUTOMOBILES	2.0	44.75	--	MEDIUM TRUCKS	4.0	44.66	--	HEAVY TRUCKS	8.0	44.75	0.00
VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY																																	
AUTOMOBILES	0.775	0.129	0.096	0.9742																																	
MEDIUM TRUCK	0.848	0.049	0.103	0.0184																																	
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HEAVY TRUCKS	8.0	44.75	0.00																																		

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	68.2	66.3	64.5	58.5	67.1	67.7
MEDIUM TRUCKS	60.7	59.2	52.8	51.3	59.7	60.0
HEAVY TRUCKS	62.0	60.5	51.5	52.7	61.1	61.2
NOISE LEVELS (dBA)	69.7	68.0	65.0	60.1	68.7	69.2

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	68.2	66.3	64.5	58.5	67.1	67.7
MEDIUM TRUCKS	60.7	59.2	52.8	51.3	59.7	60.0
HEAVY TRUCKS	62.0	60.5	51.5	52.7	61.1	61.2
NOISE LEVELS (dBA)	69.7	68.0	65.0	60.1	68.7	69.2

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	41	130	412	1302
LDN	37	117	369	1166

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

PROJECT:	Gardena U-Haul Redevelopment	JOB #:	1922-06-02
ROADWAY:	Rosecrans 2022+P	DATE:	22-Oct-21
LOCATION:	50 from CL	ENGINEER:	M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS		RECEIVER INPUT DATA	
ADT =	38,644	RECEIVER DISTANCE =	75
SPEED =	40	DIST C/L TO WALL =	10
PK HR % =	10	RECEIVER HEIGHT =	5.0
NEAR LANE/FAR LANE DIS	54	WALL DISTANCE FROM RECEIVER	65
ROAD ELEVATION =	0.0	PAD ELEVATION =	0.0
GRADE =	1.0 %	ROADWAY VIEW: LF ANGLE=	-90
PK HR VOL =	3,864	RT ANGLE=	90
		DF ANGLE=	180

SITE CONDITIONS		WALL INFORMATION	
AUTOMOBILES =	10	HTH WALL	0.0
MEDIUM TRUCKS =	10	AMBIENT=	0.0
HEAVY TRUCKS =	10	BARRIER =	0 (0 = WALL, 1 = BERM)
	(10 = HARD SITE, 15 = SOFT SITE)		

VEHICLE MIX DATA					MISC. VEHICLE INFO			
VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY				
AUTOMOBILES	0.775	0.129	0.096	0.9742				
MEDIUM TRUCK	0.848	0.049	0.103	0.0184				
HEAVY TRUCKS	0.865	0.027	0.108	0.0074				
VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT					
AUTOMOBILES	2.0	70.04	--					
MEDIUM TRUCKS	4.0	69.98	--					
HEAVY TRUCKS	8.0	70.04	0.00					

NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	70.3	68.4	66.6	60.5	69.2	69.8
MEDIUM TRUCKS	62.0	60.5	54.1	52.6	61.0	61.3
HEAVY TRUCKS	62.9	61.4	52.4	53.7	62.0	62.1
NOISE LEVELS (dBA)	71.5	69.7	67.0	61.9	70.5	71.0

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	70.3	68.4	66.6	60.5	69.2	69.8
MEDIUM TRUCKS	62.0	60.5	54.1	52.6	61.0	61.3
HEAVY TRUCKS	62.9	61.4	52.4	53.7	62.0	62.1
NOISE LEVELS (dBA)	71.5	69.7	67.0	61.9	70.5	71.0

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	93	295	934	2952
LDN	83	263	832	2632

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL

PROJECT: Gardena U-Haul Redevelopment	JOB #: 1922-06-02
ROADWAY: Rosecrans 2022+P	DATE: 22-Oct-21
LOCATION: 50 from CL	ENGINEER: M. Dickerson

NOISE INPUT DATA

ROADWAY CONDITIONS	RECEIVER INPUT DATA
ADT = 22,635	RECEIVER DISTANCE = 168
SPEED = 35	DIST C/L TO WALL = 10
PK HR % = 10	RECEIVER HEIGHT = 5.0
NEAR LANE/FAR LANE DIS = 45	WALL DISTANCE FROM RECEIVER = 158
ROAD ELEVATION = 0.0	PAD ELEVATION = 0.0
GRADE = 1.0 %	ROADWAY VIEW: LF ANGLE= -90
PK HR VOL = 2,264	RT ANGLE= 90
	DF ANGLE= 180

SITE CONDITIONS	WALL INFORMATION
AUTOMOBILES = 10	HTH WALL = 0.0
MEDIUM TRUCKS = 10 (10 = HARD SITE, 15 = SOFT SITE)	AMBIENT= 0.0
HEAVY TRUCKS = 10	BARRIER = 0 (0 = WALL, 1 = BERM)

VEHICLE MIX DATA	MISC. VEHICLE INFO																																				
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>VEHICLE TYPE</th> <th>DAY</th> <th>EVENING</th> <th>NIGHT</th> <th>DAILY</th> </tr> </thead> <tbody> <tr> <td>AUTOMOBILES</td> <td align="center">0.775</td> <td align="center">0.129</td> <td align="center">0.096</td> <td align="center">0.9742</td> </tr> <tr> <td>MEDIUM TRUCK</td> <td align="center">0.848</td> <td align="center">0.049</td> <td align="center">0.103</td> <td align="center">0.0184</td> </tr> <tr> <td>HEAVY TRUCKS</td> <td align="center">0.865</td> <td align="center">0.027</td> <td align="center">0.108</td> <td align="center">0.0074</td> </tr> </tbody> </table>	VEHICLE TYPE	DAY	EVENING	NIGHT	DAILY	AUTOMOBILES	0.775	0.129	0.096	0.9742	MEDIUM TRUCK	0.848	0.049	0.103	0.0184	HEAVY TRUCKS	0.865	0.027	0.108	0.0074	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>VEHICLE TYPE</th> <th>HEIGHT</th> <th>SLE DISTANCE</th> <th>GRADE ADJUSTMENT</th> </tr> </thead> <tbody> <tr> <td>AUTOMOBILES</td> <td align="center">2.0</td> <td align="center">166.51</td> <td align="center">--</td> </tr> <tr> <td>MEDIUM TRUCKS</td> <td align="center">4.0</td> <td align="center">166.49</td> <td align="center">--</td> </tr> <tr> <td>HEAVY TRUCKS</td> <td align="center">8.0</td> <td align="center">166.51</td> <td align="center">0.00</td> </tr> </tbody> </table>	VEHICLE TYPE	HEIGHT	SLE DISTANCE	GRADE ADJUSTMENT	AUTOMOBILES	2.0	166.51	--	MEDIUM TRUCKS	4.0	166.49	--	HEAVY TRUCKS	8.0	166.51	0.00
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NOISE OUTPUT DATA

NOISE IMPACTS (WITHOUT TOPO OR BARRIER SHIELDING)

VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	62.5	60.6	58.8	52.8	61.4	62.0
MEDIUM TRUCKS	55.0	53.5	47.1	45.6	54.0	54.3
HEAVY TRUCKS	56.2	54.8	45.8	47.0	55.4	55.5
NOISE LEVELS (dBA)	64.0	62.2	59.3	54.4	63.0	63.4

NOISE IMPACTS (WITH TOPO AND BARRIER SHIELDING)

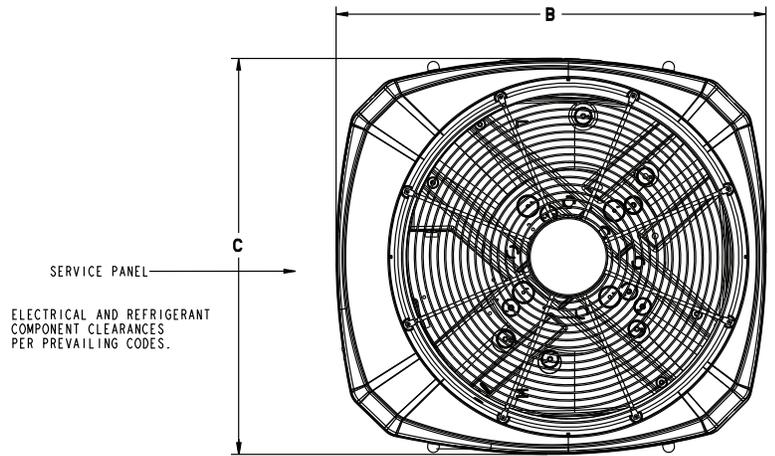
VEHICLE TYPE	PK HR LEQ	DAY LEQ	EVEN LEQ	NIGHT LEQ	LDN	CNEL
AUTOMOBILES	62.5	60.6	58.8	52.8	61.4	62.0
MEDIUM TRUCKS	55.0	53.5	47.1	45.6	54.0	54.3
HEAVY TRUCKS	56.2	54.8	45.8	47.0	55.4	55.5
NOISE LEVELS (dBA)	64.0	62.2	59.3	54.4	63.0	63.4

NOISE CONTOUR (FT)				
NOISE LEVELS	70 dBA	65 dBA	60 dBA	55 dBA
CNEL	37	118	372	1176
LDN	33	105	333	1053

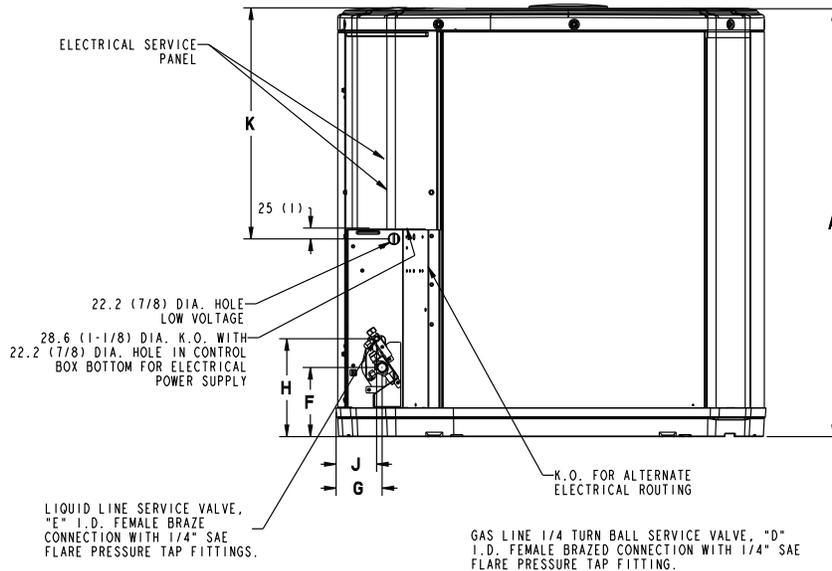
Appendix C:
SoundPLAN Input/Output



Outline Drawing



TOP DISCHARGE AREA SHOULD BE UNRESTRICTED FOR AT LEAST 1524 (5 FEET) ABOVE UNIT. UNIT SHOULD BE PLACED SO ROOF RUN-OFF WATER DOES NOT POUR DIRECTLY ON UNIT, AND SHOULD BE AT LEAST 305 (12") FROM WALL AND ALL SURROUNDING SHRUBBERY ON TWO SIDES. OTHER TWO SIDES UNRESTRICTED.



Model	Base	A	B	C	D	E	F	G	H	J	K
4TWA4060A4	4	1147 (45-1/8)	946 (37-1/4)	870 (34-1/4)	7/8	3/8	152 (6)	98 (3-7/8)	219 (8-5/8)	86 (3-3/8)	813 (32)

Sound Power Level									
MODEL	A-Weighted Sound Power Level [dB(A)]	Full Octave Sound Power (dB)							
		63 Hz*	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
4TWA4060A4	74	72	72	71	69	70	62	57	52

**Gardena U-Haul Mnd
Contribution level - 001 - Outdoor SP**

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Source	Source group	Source ty	Tr. lane	LrD dB(A)	A dB	
Receiver R1 FI G LrD,lim dB(A) LrD 43.1 dB(A)						
Trane20	Default parking lot noise	PLot		37.3	0.0	
	Default industrial noise	Point		34.3	0.0	
Trane60	Default industrial noise	Point		34.2	0.0	
	Default parking lot noise	PLot		33.0	0.0	
Trane10	Default industrial noise	Point		31.5	0.0	
Trane30	Default industrial noise	Point		29.9	0.0	
	Default parking lot noise	PLot		29.1	0.0	
Trane50	Default industrial noise	Point		29.1	0.0	
	Default parking lot noise	PLot		28.5	0.0	
	Default parking lot noise	PLot		27.8	0.0	
Trane40	Default industrial noise	Point		27.5	0.0	
	Default parking lot noise	PLot		26.5	0.0	
	Default parking lot noise	PLot		24.8	0.0	
Trane3	Default industrial noise	Point		23.4	0.0	
	Default parking lot noise	PLot		22.8	0.0	
	Default parking lot noise	PLot		21.8	0.0	
Trane2	Default industrial noise	Point		21.3	0.0	
	Default parking lot noise	PLot		20.5	0.0	
Trane1	Default industrial noise	Point		19.7	0.0	
Receiver R2 FI G LrD,lim dB(A) LrD 39.0 dB(A)						
Trane20	Default industrial noise	Point		32.0	0.0	
	Default parking lot noise	PLot		30.3	0.0	
Trane10	Default industrial noise	Point		29.0	0.0	
	Default parking lot noise	PLot		28.1	0.0	
Trane60	Default industrial noise	Point		27.1	0.0	
	Default parking lot noise	PLot		26.8	0.0	
Trane1	Default industrial noise	Point		26.7	0.0	
Trane30	Default industrial noise	Point		25.0	0.0	
	Default parking lot noise	PLot		25.0	0.0	
Trane50	Default industrial noise	Point		24.9	0.0	
Trane3	Default industrial noise	Point		24.8	0.0	
	Default parking lot noise	PLot		24.8	0.0	
	Default parking lot noise	PLot		23.8	0.0	
Trane40	Default industrial noise	Point		21.7	0.0	
Trane2	Default industrial noise	Point		21.7	0.0	
	Default parking lot noise	PLot		21.4	0.0	
	Default parking lot noise	PLot		21.4	0.0	
	Default parking lot noise	PLot		16.9	0.0	
	Default parking lot noise	PLot		15.8	0.0	
Receiver R3 FI G LrD,lim dB(A) LrD 42.6 dB(A)						
Trane10	Default industrial noise	Point		37.8	0.0	
	Default parking lot noise	PLot		37.7	0.0	
Trane20	Default industrial noise	Point		33.3	0.0	

**Gardena U-Haul Mnd
Contribution level - 001 - Outdoor SP**

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Source	Source group	Source ty	Tr. lane	LrD dB(A)	A dB	
Trane2	Default industrial noise	Point		31.0	0.0	
Trane50	Default industrial noise	Point		30.1	0.0	
Trane1	Default industrial noise	Point		28.7	0.0	
Trane40	Default industrial noise	Point		26.1	0.0	
Trane60	Default industrial noise	Point		25.5	0.0	
Trane3	Default industrial noise	Point		23.0	0.0	
Trane30	Default industrial noise	Point		21.6	0.0	
	Default parking lot noise	PLot		16.5	0.0	
	Default parking lot noise	PLot		16.4	0.0	
	Default parking lot noise	PLot		16.1	0.0	
	Default parking lot noise	PLot		15.1	0.0	
	Default parking lot noise	PLot		15.1	0.0	
	Default parking lot noise	PLot		9.1	0.0	
	Default parking lot noise	PLot		8.2	0.0	
	Default parking lot noise	PLot		7.9	0.0	
	Default parking lot noise	PLot		5.1	0.0	
Receiver R3 FI F2 LrD,lim dB(A) LrD 46.1 dB(A)						
Trane10	Default parking lot noise	PLot		43.4	0.0	
Trane20	Default industrial noise	Point		39.2	0.0	
Trane2	Default industrial noise	Point		35.2	0.0	
Trane2	Default industrial noise	Point		32.4	0.0	
Trane50	Default industrial noise	Point		31.2	0.0	
Trane1	Default industrial noise	Point		30.4	0.0	
Trane60	Default industrial noise	Point		29.5	0.0	
Trane40	Default industrial noise	Point		26.7	0.0	
Trane3	Default industrial noise	Point		25.9	0.0	
Trane30	Default industrial noise	Point		25.2	0.0	
	Default parking lot noise	PLot		21.6	0.0	
	Default parking lot noise	PLot		21.6	0.0	
	Default parking lot noise	PLot		20.5	0.0	
	Default parking lot noise	PLot		20.2	0.0	
	Default parking lot noise	PLot		19.5	0.0	
	Default parking lot noise	PLot		11.8	0.0	
	Default parking lot noise	PLot		11.2	0.0	
	Default parking lot noise	PLot		11.1	0.0	
	Default parking lot noise	PLot		7.5	0.0	
Receiver R3 FI F3 LrD,lim dB(A) LrD 45.7 dB(A)						
Trane10	Default parking lot noise	PLot		42.7	0.0	
Trane20	Default industrial noise	Point		39.4	0.0	
Trane2	Default industrial noise	Point		34.0	0.0	
Trane2	Default industrial noise	Point		32.1	0.0	
Trane60	Default industrial noise	Point		30.9	0.0	
Trane50	Default industrial noise	Point		30.8	0.0	
Trane1	Default industrial noise	Point		30.6	0.0	

Gardena U-Haul Mnd Contribution spectra - 001 - Outdoor SP

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Source	Time slice	Sum	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)
Receiver R1		FIG LrD,lim	LrD 43.1 dB(A)																											
Trane1	LrD	19.7	-11.6	-11.6	-11.6	-2.2	-2.2	-2.2	4.0	4.0	4.0	7.0	7.0	7.0	12.9	12.9	12.9	5.3	5.3	5.3	-4.0	-4.0	-4.0	-23.6	-23.6	-23.6				
Trane2	LrD	21.3	-8.9	-8.9	-8.9	-0.6	-0.6	-0.6	5.4	5.4	5.4	8.7	8.7	8.7	14.3	14.3	14.3	7.5	7.5	7.5	-0.7	-0.7	-0.7	-17.1	-17.1	-17.1				
Trane3	LrD	23.4	-8.0	-8.0	-8.0	1.3	1.3	1.3	7.6	7.6	7.6	11.0	11.0	11.0	16.3	16.3	16.3	9.4	9.4	9.4	2.1	2.1	2.1	-12.0	-12.0	-12.0				
Trane10	LrD	31.5	-0.6	-0.6	-0.6	8.6	8.6	8.6	14.7	14.7	14.7	19.9	19.9	19.9	24.4	24.4	24.4	17.5	17.5	17.5	8.6	8.6	8.6	-9.5	-9.5	-9.5				
Trane20	LrD	34.3	3.1	3.1	3.1	12.3	12.3	12.3	18.7	18.7	18.7	22.0	22.0	22.0	27.2	27.2	27.2	20.0	20.0	20.0	12.7	12.7	12.7	-1.0	-1.0	-1.0				
Trane30	LrD	29.9	1.1	1.1	1.1	7.5	7.5	7.5	13.4	13.4	13.4	16.6	16.6	16.6	23.1	23.1	23.1	15.8	15.8	15.8	7.7	7.7	7.7	-8.7	-8.7	-8.7				
Trane40	LrD	27.5	-1.3	-1.3	-1.3	7.0	7.0	7.0	12.9	12.9	12.9	15.9	15.9	15.9	20.2	20.2	20.2	12.1	12.1	12.1	2.4	2.4	2.4	-17.7	-17.7	-17.7				
Trane50	LrD	29.1	-0.5	-0.5	-0.5	8.5	8.5	8.5	14.6	14.6	14.6	17.4	17.4	17.4	21.5	21.5	21.5	15.0	15.0	15.0	5.0	5.0	5.0	-14.3	-14.3	-14.3				
Trane60	LrD	34.2	3.1	3.1	3.1	12.2	12.2	12.2	18.6	18.6	18.6	21.9	21.9	21.9	27.1	27.1	27.1	19.9	19.9	19.9	12.6	12.6	12.6	-1.1	-1.1	-1.1				
6	LrD	26.5	4.5	4.5	4.5	15.5	15.5	15.5	4.2	4.2	4.2	11.8	11.8	11.8	14.6	14.6	14.6	16.8	16.8	16.8	12.1	12.1	12.1	-1.2	-1.2	-1.2	-34.1	-34.1	-34.1	
7	LrD	22.8	-0.4	-0.4	-0.4	11.0	11.0	11.0	2.2	2.2	2.2	8.2	8.2	8.2	10.4	10.4	10.4	13.5	13.5	13.5	9.0	9.0	9.0	-3.7	-3.7	-3.7	-34.7	-34.7	-34.7	
8	LrD	20.5	2.0	2.0	2.0	10.9	10.9	10.9	-1.6	-1.6	-1.6	3.7	3.7	3.7	7.8	7.8	7.8	10.2	10.2	10.2	6.1	6.1	6.1	-10.8	-10.8	-10.8	-53.0	-53.0	-53.0	
9	LrD	27.8	5.6	5.6	5.6	18.0	18.0	18.0	7.7	7.7	7.7	11.7	11.7	11.7	15.3	15.3	15.3	17.3	17.3	17.3	13.9	13.9	13.9	2.9	2.9	2.9	-26.2	-26.2	-26.2	
10	LrD	21.8	-1.0	-1.0	-1.0	12.8	12.8	12.8	0.8	0.8	0.8	4.3	4.3	4.3	9.1	9.1	9.1	11.3	11.3	11.3	7.2	7.2	7.2	-5.4	-5.4	-5.4	-38.9	-38.9	-38.9	
1	LrD	24.8	4.6	4.6	4.6	13.7	13.7	13.7	1.4	1.4	1.4	9.4	9.4	9.4	14.0	14.0	14.0	14.7	14.7	14.7	9.9	9.9	9.9	-3.9	-3.9	-3.9	-36.9	-36.9	-36.9	
2	LrD	28.5	6.3	6.3	6.3	17.7	17.7	17.7	7.2	7.2	7.2	13.9	13.9	13.9	17.3	17.3	17.3	18.1	18.1	18.1	14.0	14.0	14.0	3.1	3.1	3.1	-22.3	-22.3	-22.3	
3	LrD	37.3	14.9	14.9	14.9	26.2	26.2	26.2	17.4	17.4	17.4	23.2	23.2	23.2	25.9	25.9	25.9	26.7	26.7	26.7	23.1	23.1	23.1	13.8	13.8	13.8	-7.1	-7.1	-7.1	
4	LrD	33.0	11.1	11.1	11.1	22.3	22.3	22.3	12.8	12.8	12.8	18.7	18.7	18.7	21.6	21.6	21.6	22.3	22.3	22.3	18.6	18.6	18.6	9.2	9.2	9.2	-12.0	-12.0	-12.0	
5	LrD	29.1	7.1	7.1	7.1	18.6	18.6	18.6	8.0	8.0	8.0	14.0	14.0	14.0	17.9	17.9	17.9	18.5	18.5	18.5	14.4	14.4	14.4	3.1	3.1	3.1	-24.1	-24.1	-24.1	
Receiver R2		FIG LrD,lim	LrD 39.0 dB(A)																											
Trane1	LrD	26.7	-2.9	-2.9	-2.9	3.7	3.7	3.7	11.2	11.2	11.2	14.4	14.4	14.4	19.6	19.6	19.6	12.4	12.4	12.4	5.4	5.4	5.4	-7.1	-7.1	-7.1				
Trane2	LrD	21.7	-6.7	-6.7	-6.7	-0.3	-0.3	-0.3	7.3	7.3	7.3	9.8	9.8	9.8	14.5	14.5	14.5	6.1	6.1	6.1	-3.0	-3.0	-3.0	-19.6	-19.6	-19.6				
Trane3	LrD	24.8	-4.6	-4.6	-4.6	1.8	1.8	1.8	9.1	9.1	9.1	13.3	13.3	13.3	17.7	17.7	17.7	9.9	9.9	9.9	1.7	1.7	1.7	-13.3	-13.3	-13.3				
Trane10	LrD	29.0	0.2	0.2	0.2	6.8	6.8	6.8	14.6	14.6	14.6	17.0	17.0	17.0	21.9	21.9	21.9	13.7	13.7	13.7	3.8	3.8	3.8	-15.3	-15.3	-15.3				
Trane20	LrD	32.0	1.5	1.5	1.5	8.4	8.4	8.4	16.4	16.4	16.4	20.1	20.1	20.1	24.9	24.9	24.9	17.0	17.0	17.0	8.3	8.3	8.3	-8.5	-8.5	-8.5				
Trane30	LrD	25.0	-5.8	-5.8	-5.8	1.1	1.1	1.1	9.6	9.6	9.6	12.8	12.8	12.8	17.5	17.5	17.5	12.2	12.2	12.2	2.0	2.0	2.0	-20.8	-20.8	-20.8				
Trane40	LrD	21.7	-6.5	-6.5	-6.5	-0.1	-0.1	-0.1	8.0	8.0	8.0	10.2	10.2	10.2	13.5	13.5	13.5	9.2	9.2	9.2	-2.7	-2.7	-2.7	-31.3	-31.3	-31.3				
Trane50	LrD	24.9	-3.3	-3.3	-3.3	3.0	3.0	3.0	10.8	10.8	10.8	13.0	13.0	13.0	17.6	17.6	17.6	10.4	10.4	10.4	-0.8	-0.8	-0.8	-24.9	-24.9	-24.9				
Trane60	LrD	27.1	-2.7	-2.7	-2.7	4.1	4.1	4.1	12.4	12.4	12.4	15.4	15.4	15.4	19.8	19.8	19.8	12.3	12.3	12.3	2.4	2.4	2.4	-18.4	-18.4	-18.4				
6	LrD	30.3	8.9	8.9	8.9	18.7	18.7	18.7	10.1	10.1	10.1	16.0	16.0	16.0	19.2	19.2	19.2	19.8	19.8	19.8	16.0	16.0	16.0	6.0	6.0	6.0	-17.6	-17.6	-17.6	
7	LrD	25.0	5.6	5.6	5.6	14.8	14.8	14.8	3.5	3.5	3.5	9.6	9.6	9.6	13.3	13.3	13.3	14.2	14.2	14.2	10.2	10.2	10.2	-1.3	-1.3	-1.3	-29.2	-29.2	-29.2	
8	LrD	26.8	7.4	7.4	7.4	15.9	15.9	15.9	5.0	5.0	5.0	10.6	10.6	10.6	14.2	14.2	14.2	16.9	16.9	16.9	13.9	13.9	13.9	1.8	1.8	1.8	-28.4	-28.4	-28.4	
9	LrD	21.4	2.9	2.9	2.9	10.8	10.8	10.8	-2.5	-2.5	-2.5	2.5	2.5	2.5	9.9	9.9	9.9	12.1	12.1	12.1	6.1	6.1	6.1	-12.0	-12.0	-12.0	-59.6	-59.6	-59.6	
10	LrD	24.8	5.8	5.8	5.8	15.2	15.2	15.2	3.7	3.7	3.7	7.5	7.5	7.5	12.3	12.3	12.3	14.4	14.4	14.4	10.4	10.4	10.4	-0.1	-0.1	-0.1	-25.0	-25.0	-25.0	
1	LrD	15.8	-3.7	-3.7	-3.7	3.9	3.9	3.9	-4.5	-4.5	-4.5	2.0	2.0	2.0	4.0	4.0	4.0	6.3	6.3	6.3	0.8	0.8	0.8	-21.4	-21.4	-21.4	-80.2	-80.2	-80.2	

Gardena U-Haul Mnd Contribution spectra - 001 - Outdoor SP

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Source	Time slice	Sum	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)
2	LrD	16.9	-4.7	-4.7	-4.7	3.3	3.3	3.3	-4.5	-4.5	-4.5	2.1	2.1	2.1	5.8	5.8	5.8	7.8	7.8	7.8	2.8	2.8	2.8	-16.8	-16.8	-16.8	-67.8	-67.8	-67.8	
3	LrD	23.8	1.8	1.8	1.8	10.2	10.2	10.2	2.5	2.5	2.5	9.0	9.0	9.0	12.5	12.5	12.5	14.7	14.7	14.7	10.1	10.1	10.1	-7.2	-7.2	-7.2	-50.2	-50.2	-50.2	
4	LrD	21.4	-0.6	-0.6	-0.6	8.5	8.5	8.5	1.1	1.1	1.1	7.4	7.4	7.4	9.5	9.5	9.5	12.2	12.2	12.2	7.5	7.5	7.5	-6.7	-6.7	-6.7	-42.4	-42.4	-42.4	
5	LrD	28.1	8.0	8.0	8.0	17.2	17.2	17.2	7.1	7.1	7.1	13.2	13.2	13.2	16.6	16.6	16.6	17.6	17.6	17.6	13.5	13.5	13.5	2.0	2.0	2.0	-25.6	-25.6	-25.6	
Receiver R3		FIG	LrD,lim dB(A) LrD 42.6 dB(A)																											
Trane1	LrD	28.7	0.5	0.5	0.5	7.8	7.8	7.8	13.7	13.7	13.7	16.9	16.9	16.9	21.5	21.5	21.5	13.7	13.7	13.7	6.1	6.1	6.1	-5.8	-5.8	-5.8				
Trane2	LrD	31.0	1.9	1.9	1.9	9.3	9.3	9.3	15.9	15.9	15.9	19.0	19.0	19.0	23.8	23.8	23.8	16.2	16.2	16.2	8.9	8.9	8.9	-2.5	-2.5	-2.5				
Trane3	LrD	23.0	-5.7	-5.7	-5.7	0.4	0.4	0.4	5.4	5.4	5.4	11.4	11.4	11.4	16.0	16.0	16.0	8.3	8.3	8.3	0.0	0.0	0.0	-14.8	-14.8	-14.8				
Trane10	LrD	37.8	9.4	9.4	9.4	16.6	16.6	16.6	22.6	22.6	22.6	25.7	25.7	25.7	30.6	30.6	30.6	23.0	23.0	23.0	15.5	15.5	15.5	3.5	3.5	3.5				
Trane20	LrD	33.3	4.3	4.3	4.3	11.2	11.2	11.2	17.3	17.3	17.3	21.5	21.5	21.5	26.2	26.2	26.2	18.4	18.4	18.4	9.9	9.9	9.9	-5.0	-5.0	-5.0				
Trane30	LrD	21.6	-4.8	-4.8	-4.8	1.6	1.6	1.6	6.9	6.9	6.9	8.6	8.6	8.6	14.3	14.3	14.3	8.4	8.4	8.4	-4.0	-4.0	-4.0	-31.3	-31.3	-31.3				
Trane40	LrD	26.1	-3.2	-3.2	-3.2	3.7	3.7	3.7	10.1	10.1	10.1	13.3	13.3	13.3	19.0	19.0	19.0	12.7	12.7	12.7	3.1	3.1	3.1	-16.8	-16.8	-16.8				
Trane50	LrD	30.1	1.3	1.3	1.3	8.3	8.3	8.3	14.6	14.6	14.6	17.7	17.7	17.7	23.0	23.0	23.0	16.0	16.0	16.0	7.4	7.4	7.4	-8.5	-8.5	-8.5				
Trane60	LrD	25.5	-0.8	-0.8	-0.8	5.6	5.6	5.6	11.0	11.0	11.0	12.7	12.7	12.7	18.6	18.6	18.6	9.9	9.9	9.9	-0.8	-0.8	-0.8	-21.1	-21.1	-21.1				
6	LrD	15.1	-2.3	-2.3	-2.3	3.3	3.3	3.3	-8.4	-8.4	-8.4	-1.5	-1.5	-1.5	5.1	5.1	5.1	5.0	5.0	5.0	-1.2	-1.2	-1.2	-18.5	-18.5	-18.5	-55.8	-55.8	-55.8	
7	LrD	15.1	-4.9	-4.9	-4.9	0.6	0.6	0.6	-11.4	-11.4	-11.4	4.3	4.3	4.3	4.4	4.4	4.4	4.6	4.6	4.6	-1.1	-1.1	-1.1	-15.4	-15.4	-15.4	-48.1	-48.1	-48.1	
8	LrD	37.7	19.3	19.3	19.3	29.0	29.0	29.0	20.4	20.4	20.4	24.5	24.5	24.5	24.9	24.9	24.9	24.3	24.3	24.3	19.6	19.6	19.6	9.8	9.8	9.8				
9	LrD	9.1	-6.6	-6.6	-6.6	-1.5	-1.5	-1.5	-13.3	-13.3	-13.3	-11.1	-11.1	-11.1	-2.3	-2.3	-2.3	-0.3	-0.3	-0.3	-8.6	-8.6	-8.6	-31.0	-31.0	-31.0	-72.8	-72.8	-72.8	
10	LrD	5.1	-8.8	-8.8	-8.8	-3.5	-3.5	-3.5	-15.7	-15.7	-15.7	-12.6	-12.6	-12.6	-8.0	-8.0	-8.0	-6.9	-6.9	-6.9	-12.9	-12.9	-12.9	-27.1	-27.1	-27.1	-55.4	-55.4	-55.4	
1	LrD	7.9	-6.4	-6.4	-6.4	-0.9	-0.9	-0.9	-11.7	-11.7	-11.7	-10.1	-10.1	-10.1	-5.4	-5.4	-5.4	-3.0	-3.0	-3.0	-13.7	-13.7	-13.7	-40.9	-40.9	-40.9	-93.8	-93.8	-93.8	
2	LrD	8.2	-6.5	-6.5	-6.5	-0.8	-0.8	-0.8	-11.8	-11.8	-11.8	-10.2	-10.2	-10.2	-4.6	-4.6	-4.6	-2.5	-2.5	-2.5	-11.7	-11.7	-11.7	-37.0	-37.0	-37.0	-84.6	-84.6	-84.6	
3	LrD	16.1	-0.3	-0.3	-0.3	5.7	5.7	5.7	-5.4	-5.4	-5.4	0.1	0.1	0.1	5.2	5.2	5.2	5.7	5.7	5.7	-2.0	-2.0	-2.0	-22.1	-22.1	-22.1	-67.6	-67.6	-67.6	
4	LrD	16.4	-1.3	-1.3	-1.3	7.3	7.3	7.3	-1.9	-1.9	-1.9	3.1	3.1	3.1	4.0	4.0	4.0	4.4	4.4	4.4	-2.1	-2.1	-2.1	-18.0	-18.0	-18.0	-56.8	-56.8	-56.8	
5	LrD	16.5	-2.2	-2.2	-2.2	3.6	3.6	3.6	-7.8	-7.8	-7.8	4.3	4.3	4.3	6.0	6.0	6.0	6.3	6.3	6.3	-0.1	-0.1	-0.1	-16.8	-16.8	-16.8	-55.7	-55.7	-55.7	
Receiver R3		FI F2	LrD,lim dB(A) LrD 46.1 dB(A)																											
Trane1	LrD	30.4	0.9	0.9	0.9	7.9	7.9	7.9	14.9	14.9	14.9	19.0	19.0	19.0	23.1	23.1	23.1	15.9	15.9	15.9	9.6	9.6	9.6	-0.6	-0.6	-0.6				
Trane2	LrD	32.4	2.2	2.2	2.2	9.2	9.2	9.2	17.0	17.0	17.0	20.8	20.8	20.8	25.1	25.1	25.1	18.0	18.0	18.0	11.8	11.8	11.8	1.9	1.9	1.9				
Trane3	LrD	25.9	-4.6	-4.6	-4.6	2.2	2.2	2.2	8.8	8.8	8.8	14.8	14.8	14.8	18.8	18.8	18.8	11.1	11.1	11.1	3.5	3.5	3.5	-10.2	-10.2	-10.2				
Trane10	LrD	39.2	9.6	9.6	9.6	16.6	16.6	16.6	23.7	23.7	23.7	27.5	27.5	27.5	31.9	31.9	31.9	24.8	24.8	24.8	18.4	18.4	18.4	8.1	8.1	8.1				
Trane20	LrD	35.2	5.3	5.3	5.3	11.8	11.8	11.8	18.5	18.5	18.5	23.7	23.7	23.7	28.0	28.0	28.0	20.8	20.8	20.8	13.9	13.9	13.9	1.4	1.4	1.4				
Trane30	LrD	25.2	-4.1	-4.1	-4.1	2.9	2.9	2.9	9.2	9.2	9.2	13.4	13.4	13.4	18.1	18.1	18.1	10.9	10.9	10.9	0.5	0.5	0.5	-22.1	-22.1	-22.1				
Trane40	LrD	26.7	-1.4	-1.4	-1.4	4.5	4.5	4.5	10.9	10.9	10.9	15.0	15.0	15.0	19.6	19.6	19.6	12.5	12.5	12.5	3.2	3.2	3.2	-16.2	-16.2	-16.2				
Trane50	LrD	31.2	2.5	2.5	2.5	8.9	8.9	8.9	15.4	15.4	15.4	19.5	19.5	19.5	23.9	23.9	23.9	17.0	17.0	17.0	9.3	9.3	9.3	-5.2	-5.2	-5.2				
Trane60	LrD	29.5	0.0	0.0	0.0	6.9	6.9	6.9	13.4	13.4	13.4	17.5	17.5	17.5	22.5	22.5	22.5	14.5	14.5	14.5	5.5	5.5	5.5	-12.3	-12.3	-12.3				
6	LrD	19.5	0.0	0.0	0.0	5.3	5.3	5.3	-5.8	-5.8	-5.8	1.8	1.8	1.8	10.1	10.1	10.1	10.1	10.1	10.1	4.4	4.4	4.4	-11.9	-11.9	-11.9	-51.1	-51.1	-51.1	
7	LrD	20.5	-0.4	-0.4	-0.4	5.3	5.3	5.3	-6.4	-6.4	-6.4	8.2	8.2	8.2	10.2	10.2	10.2	10.6	10.6	10.6	6.0	6.0	6.0	-6.7	-6.7	-6.7	-37.9	-37.9	-37.9	

Gardena U-Haul Mnd Contribution spectra - 001 - Outdoor SP

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Source	Time slice	Sum	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)
8	LrD	43.4	23.1	23.1	23.1	33.3	33.3	33.3	25.3	25.3	25.3	30.2	30.2	30.2	31.1	31.1	31.1	31.5	31.5	31.5	28.4	28.4	28.4	21.0	21.0	21.0	5.1	5.1	5.1	
9	LrD	11.2	-6.9	-6.9	-6.9	-1.5	-1.5	-1.5	-12.1	-12.1	-12.1	-9.7	-9.7	-9.7	0.0	0.0	0.0	2.7	2.7	2.7	-3.8	-3.8	-3.8	-25.9	-25.9	-25.9	-73.2	-73.2	-73.2	
10	LrD	7.5	-6.7	-6.7	-6.7	-2.3	-2.3	-2.3	-14.2	-14.2	-14.2	-11.3	-11.3	-11.3	-4.7	-4.7	-4.7	-3.2	-3.2	-3.2	-9.3	-9.3	-9.3	-24.7	-24.7	-24.7	-55.2	-55.2	-55.2	
1	LrD	11.1	-5.8	-5.8	-5.8	1.3	1.3	1.3	-8.2	-8.2	-8.2	-6.1	-6.1	-6.1	-1.4	-1.4	-1.4	1.4	1.4	1.4	-8.5	-8.5	-8.5	-36.7	-36.7	-36.7	-94.2	-94.2	-94.2	
2	LrD	11.8	-5.9	-5.9	-5.9	0.9	0.9	0.9	-8.8	-8.8	-8.8	-6.8	-6.8	-6.8	0.5	0.5	0.5	2.6	2.6	2.6	-6.2	-6.2	-6.2	-32.1	-32.1	-32.1	-84.9	-84.9	-84.9	
3	LrD	20.2	0.7	0.7	0.7	7.7	7.7	7.7	-2.3	-2.3	-2.3	3.4	3.4	3.4	10.2	10.2	10.2	10.7	10.7	10.7	3.9	3.9	3.9	-15.0	-15.0	-15.0	-60.4	-60.4	-60.4	
4	LrD	21.6	3.4	3.4	3.4	11.3	11.3	11.3	1.3	1.3	1.3	7.4	7.4	7.4	10.2	10.2	10.2	10.6	10.6	10.6	5.4	5.4	5.4	-9.1	-9.1	-9.1	-45.2	-45.2	-45.2	
5	LrD	21.6	1.2	1.2	1.2	7.2	7.2	7.2	-3.8	-3.8	-3.8	7.9	7.9	7.9	11.6	11.6	11.6	12.0	12.0	12.0	6.6	6.6	6.6	-8.5	-8.5	-8.5	-45.5	-45.5	-45.5	
Receiver R3 FI F3 LrD,lim dB(A)		LrD 45.7 dB(A)																												
Trane1	LrD	30.6	0.7	0.7	0.7	7.9	7.9	7.9	15.4	15.4	15.4	18.9	18.9	18.9	23.2	23.2	23.2	16.4	16.4	16.4	11.0	11.0	11.0	2.5	2.5	2.5				
Trane2	LrD	32.1	2.1	2.1	2.1	9.4	9.4	9.4	16.8	16.8	16.8	20.3	20.3	20.3	24.6	24.6	24.6	17.8	17.8	17.8	12.4	12.4	12.4	4.2	4.2	4.2				
Trane3	LrD	26.9	-4.6	-4.6	-4.6	2.6	2.6	2.6	10.2	10.2	10.2	14.2	14.2	14.2	19.3	19.3	19.3	15.2	15.2	15.2	8.7	8.7	8.7	-2.7	-2.7	-2.7				
Trane10	LrD	39.4	9.5	9.5	9.5	16.6	16.6	16.6	24.2	24.2	24.2	27.7	27.7	27.7	31.9	31.9	31.9	25.1	25.1	25.1	19.4	19.4	19.4	10.4	10.4	10.4				
Trane20	LrD	34.0	4.3	4.3	4.3	11.4	11.4	11.4	18.9	18.9	18.9	22.4	22.4	22.4	26.6	26.6	26.6	19.5	19.5	19.5	13.1	13.1	13.1	1.5	1.5	1.5				
Trane30	LrD	26.9	-4.0	-4.0	-4.0	3.1	3.1	3.1	10.6	10.6	10.6	14.5	14.5	14.5	19.4	19.4	19.4	14.5	14.5	14.5	6.1	6.1	6.1	-13.7	-13.7	-13.7				
Trane40	LrD	26.0	-3.3	-3.3	-3.3	3.7	3.7	3.7	11.1	11.1	11.1	14.6	14.6	14.6	18.6	18.6	18.6	11.0	11.0	11.0	2.7	2.7	2.7	-15.9	-15.9	-15.9				
Trane50	LrD	30.8	1.3	1.3	1.3	8.3	8.3	8.3	15.8	15.8	15.8	19.3	19.3	19.3	23.5	23.5	23.5	16.3	16.3	16.3	9.4	9.4	9.4	-4.1	-4.1	-4.1				
Trane60	LrD	30.9	0.0	0.0	0.0	7.2	7.2	7.2	14.7	14.7	14.7	18.6	18.6	18.6	23.4	23.4	23.4	18.0	18.0	18.0	12.0	12.0	12.0	-3.1	-3.1	-3.1				
6	LrD	20.3	1.4	1.4	1.4	8.6	8.6	8.6	-0.9	-0.9	-0.9	3.6	3.6	3.6	10.3	10.3	10.3	10.2	10.2	10.2	4.5	4.5	4.5	-11.7	-11.7	-11.7	-49.3	-49.3	-49.3	
7	LrD	20.8	0.4	0.4	0.4	7.2	7.2	7.2	-3.4	-3.4	-3.4	8.4	8.4	8.4	10.3	10.3	10.3	10.6	10.6	10.6	6.0	6.0	6.0	-6.7	-6.7	-6.7	-37.8	-37.8	-37.8	
8	LrD	42.7	23.1	23.1	23.1	32.8	32.8	32.8	24.8	24.8	24.8	29.5	29.5	29.5	30.3	30.3	30.3	30.8	30.8	30.8	27.7	27.7	27.7	20.2	20.2	20.2	3.8	3.8	3.8	
9	LrD	13.5	-4.3	-4.3	-4.3	2.6	2.6	2.6	-7.1	-7.1	-7.1	-4.2	-4.2	-4.2	1.5	1.5	1.5	4.5	4.5	4.5	-2.9	-2.9	-2.9	-25.0	-25.0	-25.0	-68.4	-68.4	-68.4	
10	LrD	9.3	-5.2	-5.2	-5.2	0.9	0.9	0.9	-10.0	-10.0	-10.0	-8.5	-8.5	-8.5	-4.4	-4.4	-4.4	-2.9	-2.9	-2.9	-8.5	-8.5	-8.5	-22.5	-22.5	-22.5	-50.9	-50.9	-50.9	
1	LrD	13.6	-4.4	-4.4	-4.4	3.9	3.9	3.9	-4.1	-4.1	-4.1	-0.2	-0.2	-0.2	1.5	1.5	1.5	2.6	2.6	2.6	-6.0	-6.0	-6.0	-29.6	-29.6	-29.6	-84.0	-84.0	-84.0	
2	LrD	13.9	-4.8	-4.8	-4.8	3.5	3.5	3.5	-4.5	-4.5	-4.5	-0.9	-0.9	-0.9	2.1	2.1	2.1	3.8	3.8	3.8	-4.4	-4.4	-4.4	-27.6	-27.6	-27.6	-76.8	-76.8	-76.8	
3	LrD	21.7	2.2	2.2	2.2	10.3	10.3	10.3	1.8	1.8	1.8	6.8	6.8	6.8	11.2	11.2	11.2	11.6	11.6	11.6	4.8	4.8	4.8	-14.2	-14.2	-14.2	-59.3	-59.3	-59.3	
4	LrD	22.2	3.4	3.4	3.4	11.9	11.9	11.9	2.3	2.3	2.3	8.1	8.1	8.1	10.9	10.9	10.9	11.2	11.2	11.2	6.0	6.0	6.0	-8.7	-8.7	-8.7	-44.8	-44.8	-44.8	
5	LrD	22.4	2.3	2.3	2.3	9.8	9.8	9.8	0.9	0.9	0.9	9.0	9.0	9.0	12.0	12.0	12.0	12.2	12.2	12.2	6.7	6.7	6.7	-8.4	-8.4	-8.4	-45.4	-45.4	-45.4	
Receiver R4 FI G LrD,lim dB(A)		LrD 43.8 dB(A)																												
Trane1	LrD	12.2	-14.0	-14.0	-14.0	-7.8	-7.8	-7.8	-2.6	-2.6	-2.6	-1.1	-1.1	-1.1	5.3	5.3	5.3	-2.4	-2.4	-2.4	-14.8	-14.8	-14.8	-42.7	-42.7	-42.7				
Trane2	LrD	13.2	-12.9	-12.9	-12.9	-6.7	-6.7	-6.7	-1.6	-1.6	-1.6	0.0	0.0	0.0	6.3	6.3	6.3	-1.6	-1.6	-1.6	-13.5	-13.5	-13.5	-39.4	-39.4	-39.4				
Trane3	LrD	13.2	-12.9	-12.9	-12.9	-6.6	-6.6	-6.6	-1.5	-1.5	-1.5	0.0	0.0	0.0	6.3	6.3	6.3	-1.8	-1.8	-1.8	-13.7	-13.7	-13.7	-39.3	-39.3	-39.3				
Trane10	LrD	25.9	-1.7	-1.7	-1.7	4.5	4.5	4.5	9.6	9.6	9.6	11.1	11.1	11.1	19.5	19.5	19.5	11.7	11.7	11.7	0.7	0.7	0.7	-24.0	-24.0	-24.0				
Trane20	LrD	24.3	-1.3	-1.3	-1.3	4.8	4.8	4.8	9.8	9.8	9.8	11.3	11.3	11.3	17.4	17.4	17.4	9.2	9.2	9.2	-2.3	-2.3	-2.3	-25.9	-25.9	-25.9				
Trane30	LrD	41.1	12.1	12.1	12.1	19.3	19.3	19.3	25.4	25.4	25.4	28.9	28.9	28.9	34.0	34.0	34.0	26.5	26.5	26.5	19.3	19.3	19.3	7.5	7.5	7.5				
Trane40	LrD	38.6	10.1	10.1	10.1	16.9	16.9	16.9	23.0	23.0	23.0	26.2	26.2	26.2	31.5	31.5	31.5	24.3	24.3	24.3	17.4	17.4	17.4	5.6	5.6	5.6				

Gardena U-Haul Mnd Contribution spectra - 001 - Outdoor SP

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Source	Time slice	Sum	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)															
Trane50	LrD	29.0	2.2	2.2	2.2	8.4	8.4	8.4	13.6	13.6	13.6	15.2	15.2	15.2	22.3	22.3	22.3	14.4	14.4	14.4	4.2	4.2	4.2	-16.2	-16.2	-16.2			
Trane60	LrD	29.6	2.9	2.9	2.9	9.0	9.0	9.0	14.0	14.0	14.0	15.6	15.6	15.6	23.0	23.0	23.0	15.0	15.0	15.0	5.4	5.4	5.4	-14.0	-14.0	-14.0			
6	LrD	9.2	-3.4	-3.4	-3.4	1.7	1.7	1.7	-9.6	-9.6	-9.6	-8.0	-8.0	-8.0	-5.3	-5.3	-5.3	-5.9	-5.9	-5.9	-15.0	-15.0	-15.0	-40.3	-40.3	-40.3	-101.5	-101.5	-101.5
7	LrD	5.9	-7.0	-7.0	-7.0	-1.8	-1.8	-1.8	-12.9	-12.9	-12.9	-11.3	-11.3	-11.3	-10.0	-10.0	-10.0	-7.4	-7.4	-7.4	-14.7	-14.7	-14.7	-39.2	-39.2	-39.2	-96.4	-96.4	-96.4
8	LrD	9.5	-3.9	-3.9	-3.9	1.2	1.2	1.2	-10.0	-10.0	-10.0	-8.4	-8.4	-8.4	-5.7	-5.7	-5.7	-1.5	-1.5	-1.5	-12.6	-12.6	-12.6	-40.5	-40.5	-40.5	-95.7	-95.7	-95.7
9	LrD	19.0	-0.1	-0.1	-0.1	5.2	5.2	5.2	-7.2	-7.2	-7.2	-5.9	-5.9	-5.9	8.6	8.6	8.6	10.8	10.8	10.8	4.5	4.5	4.5	-14.2	-14.2	-14.2	-58.1	-58.1	-58.1
10	LrD	4.9	-9.1	-9.1	-9.1	-4.2	-4.2	-4.2	-15.7	-15.7	-15.7	-14.1	-14.1	-14.1	-13.8	-13.8	-13.8	-4.3	-4.3	-4.3	-12.4	-12.4	-12.4	-37.6	-37.6	-37.6	-101.9	-101.9	-101.9
1	LrD	31.1	12.0	12.0	12.0	21.2	21.2	21.2	8.8	8.8	8.8	15.3	15.3	15.3	19.5	19.5	19.5	20.2	20.2	20.2	15.9	15.9	15.9	4.6	4.6	4.6	-21.3	-21.3	-21.3
2	LrD	20.1	2.0	2.0	2.0	9.6	9.6	9.6	-2.8	-2.8	-2.8	4.6	4.6	4.6	9.2	9.2	9.2	9.5	9.5	9.5	4.0	4.0	4.0	-12.8	-12.8	-12.8	-54.6	-54.6	-54.6
3	LrD	21.7	4.4	4.4	4.4	10.9	10.9	10.9	-1.6	-1.6	-1.6	0.0	0.0	0.0	11.4	11.4	11.4	11.7	11.7	11.7	5.7	5.7	5.7	-13.3	-13.3	-13.3	-59.3	-59.3	-59.3
4	LrD	14.2	-2.1	-2.1	-2.1	3.5	3.5	3.5	-8.5	-8.5	-8.5	-6.7	-6.7	-6.7	3.4	3.4	3.4	4.4	4.4	4.4	-1.3	-1.3	-1.3	-23.7	-23.7	-23.7	-81.4	-81.4	-81.4
5	LrD	10.6	-2.1	-2.1	-2.1	3.2	3.2	3.2	-8.4	-8.4	-8.4	-6.7	-6.7	-6.7	3.5	3.5	3.5	4.4	4.4	4.4	-5.6	-5.6	-5.6	-39.7	-39.7	-39.7	-95.6	-95.6	-95.6

**Gardena U-Haul Mnd
Contribution level - 001 - Outdoor SP**

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Source	Source group	Source ty	Tr. lane	LrD dB(A)	A dB	
Trane3	Default industrial noise	Point		26.9	0.0	
Trane30	Default industrial noise	Point		26.9	0.0	
Trane40	Default industrial noise	Point		26.0	0.0	
	Default parking lot noise	PLot		22.4	0.0	
	Default parking lot noise	PLot		22.2	0.0	
	Default parking lot noise	PLot		21.7	0.0	
	Default parking lot noise	PLot		20.8	0.0	
	Default parking lot noise	PLot		20.3	0.0	
	Default parking lot noise	PLot		13.9	0.0	
	Default parking lot noise	PLot		13.6	0.0	
	Default parking lot noise	PLot		13.5	0.0	
	Default parking lot noise	PLot		9.3	0.0	
Receiver R4 FI G LrD,lim dB(A) LrD 43.8 dB(A)						
Trane30	Default industrial noise	Point		41.1	0.0	
Trane40	Default industrial noise	Point		38.6	0.0	
	Default parking lot noise	PLot		31.1	0.0	
Trane60	Default industrial noise	Point		29.6	0.0	
Trane50	Default industrial noise	Point		29.0	0.0	
Trane10	Default industrial noise	Point		25.9	0.0	
Trane20	Default industrial noise	Point		24.3	0.0	
	Default parking lot noise	PLot		21.7	0.0	
	Default parking lot noise	PLot		20.1	0.0	
	Default parking lot noise	PLot		19.0	0.0	
	Default parking lot noise	PLot		14.2	0.0	
Trane3	Default industrial noise	Point		13.2	0.0	
Trane2	Default industrial noise	Point		13.2	0.0	
Trane1	Default industrial noise	Point		12.2	0.0	
	Default parking lot noise	PLot		10.6	0.0	
	Default parking lot noise	PLot		9.5	0.0	
	Default parking lot noise	PLot		9.2	0.0	
	Default parking lot noise	PLot		5.9	0.0	
	Default parking lot noise	PLot		4.9	0.0	

Gardena U-Haul Mnd Octave spectra of the sources in dB(A) - 001 - Outdoor SP

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Name	Source type	I 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,m ²	dB(A)	dB	dB(A)	dB(A)	dB	dB	dB(A)	dB			dB(A)								
Trane1	Point				74.0	74.0	0.0	0.0		0	100%/24h	Trane 4TWA4060A4	47.1	57.2	63.7	67.1	71.3	64.5	59.3	52.2	
Trane2	Point				74.0	74.0	0.0	0.0		0	100%/24h	Trane 4TWA4060A4	47.1	57.2	63.7	67.1	71.3	64.5	59.3	52.2	
Trane3	Point				74.0	74.0	0.0	0.0		0	100%/24h	Trane 4TWA4060A4	47.1	57.2	63.7	67.1	71.3	64.5	59.3	52.2	
Trane10	Point				84.0	84.0	0.0	0.0		0	100%/24h	Trane 4TWA4060A4	57.1	67.2	73.7	77.1	81.3	74.5	69.3	62.2	
Trane20	Point				84.0	84.0	0.0	0.0		0	100%/24h	Trane 4TWA4060A4	57.1	67.2	73.7	77.1	81.3	74.5	69.3	62.2	
Trane30	Point				84.0	84.0	0.0	0.0		0	100%/24h	Trane 4TWA4060A4	57.1	67.2	73.7	77.1	81.3	74.5	69.3	62.2	
Trane40	Point				84.0	84.0	0.0	0.0		0	100%/24h	Trane 4TWA4060A4	57.1	67.2	73.7	77.1	81.3	74.5	69.3	62.2	
Trane50	Point				84.0	84.0	0.0	0.0		0	100%/24h	Trane 4TWA4060A4	57.1	67.2	73.7	77.1	81.3	74.5	69.3	62.2	
Trane60	Point				84.0	84.0	0.0	0.0		0	100%/24h	Trane 4TWA4060A4	57.1	67.2	73.7	77.1	81.3	74.5	69.3	62.2	
	PLot	99.38			54.8	74.8	0.0	0.0		0	Uhaul Storage	Typical spectrum	58.1	69.7	62.2	66.7	66.8	67.2	64.5	58.3	45.5
	PLot	51.65			54.6	71.8	0.0	0.0		0	Uhaul Storage	Typical spectrum	55.1	66.7	59.2	63.7	63.8	64.2	61.5	55.3	42.5
	PLot	382.37			51.2	77.0	0.0	0.0		0	Uhaul Storage	Typical spectrum	60.3	71.9	64.4	68.9	69.0	69.4	66.7	60.5	47.7
	PLot	202.92			51.7	74.8	0.0	0.0		0	Uhaul Storage	Typical spectrum	58.1	69.7	62.2	66.7	66.8	67.2	64.5	58.3	45.5
	PLot	45.44			53.4	70.0	0.0	0.0		0	Uhaul Storage	Typical spectrum	53.4	65.0	57.5	62.0	62.1	62.5	59.8	53.6	40.8
	PLot	118.90			54.0	74.8	0.0	0.0		0	Uhaul Storage	Typical spectrum	58.1	69.7	62.2	66.7	66.8	67.2	64.5	58.3	45.5
	PLot	83.19			53.8	73.0	0.0	0.0		0	Uhaul Storage	Typical spectrum	56.4	68.0	60.5	65.0	65.1	65.5	62.8	56.6	43.8
	PLot	206.51			55.0	78.2	0.0	0.0		0	Uhaul Storage	Typical spectrum	61.5	73.1	65.6	70.1	70.2	70.6	67.9	61.7	48.9
	PLot	97.30			54.1	74.0	0.0	0.0		0	Uhaul Storage	Typical spectrum	57.3	68.9	61.4	65.9	66.0	66.4	63.7	57.5	44.7
	PLot	117.81			54.7	75.5	0.0	0.0		0	Uhaul Storage	Typical spectrum	58.8	70.4	62.9	67.4	67.5	67.9	65.2	59.0	46.2

Appendix D:
Construction Noise Modeling Output

Receptor - Commercial to the North

A	B	C	D	E	F	G	H	I	J
Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA	Dist. To Recptr.	Item Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Recptr. Item Lmax, dBA	Recptr. Item Leq, dBA
DEMO									
1. Concrete/Industrial Saws	1	82	300	73	0.73	-15.6	-1.4	66.4	65.1
2. Excavators	3	85	300	38	0.38	-15.6	-4.2	69.4	65.2
3. Rubber Tired Dozers	2	85	300	40	0.40	-15.6	-4.0	69.4	65.5
							Log Sum	77	73
SITE PREP									
1. Tractors/Loaders/Backhoes	4	80	300	37	0.37	-15.6	-4.3	64.4	60.1
2. Rubber Tired Dozers	3	85	300	40	0.40	-15.6	-4.0	69.4	65.5
							Log Sum	76	72
GRADE									
1. Excavators	1	85	300	38	0.38	-15.6	-4.2	69.4	65.2
2. Graders	1	85	300	41	0.41	-15.6	-3.9	69.4	65.6
3. Rubber Tired Dozers	1	85	300	40	0.40	-15.6	-4.0	69.4	65.5
5. Tractors/Loaders/Backhoes	3	80	300	37	0.37	-15.6	-4.3	64.4	60.1
							Log Sum	75	71
BUILD									
1. Cranes	1	83	300	29	0.29	-15.6	-5.4	67.4	62.1
2. Forklifts	3	85	300	20	0.20	-15.6	-7.0	69.4	62.4
3. Generator Sets	1	82	300	74	0.74	-15.6	-1.3	66.4	65.1
4. Tractor/Loaders/Backhoes	3	80	300	37	0.37	-15.6	-4.3	64.4	60.1
5. Welders	1	73	300	45	0.45	-15.6	-3.5	57.4	54.0
							Log Sum	77	71
PAVE									
1. Pavers	1	85	300	42	0.42	-15.6	-3.8	69.4	65.7
2. Paving Equipment	2	85	300	36	0.36	-15.6	-4.4	69.4	65.0
3. Rollers	2	85	300	38	0.38	-15.6	-4.2	69.4	65.2
4. Cement and Mortar Mixers	2	85	300	56	0.56	-15.6	-2.5	69.4	66.9
5. Tractors/Loaders/Backhoes	1	80	300	37	0.37	-15.6	-4.3	64.4	60.1
							Log Sum	76	72
ARCH COAT									
1. Air Compressors	1	80	300	48	0.48	-15.6	-3.2	64.4	61.2
							Log Sum	64	61

Receptor - Commercial to the South

A	B	C	D	E	F	G	H	I	J
Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA	Dist. To Recptr.	Item Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Recptr. Item Lmax, dBA	Recptr. Item Leq, dBA
DEMO									
1. Concrete/Industrial Saws	1	82	400	73	0.73	-18.1	-1.4	63.9	62.6
2. Excavators	3	85	400	38	0.38	-18.1	-4.2	66.9	62.7
3. Rubber Tired Dozers	2	85	400	40	0.40	-18.1	-4.0	66.9	63.0
							Log Sum	74	71
SITE PREP									
1. Tractors/Loaders/Backhoes	4	80	400	37	0.37	-18.1	-4.3	61.9	57.6
2. Rubber Tired Dozers	3	85	400	40	0.40	-18.1	-4.0	66.9	63.0
							Log Sum	73	69
GRADE									
1. Excavators	1	85	400	38	0.38	-18.1	-4.2	66.9	62.7
2. Graders	1	85	400	41	0.41	-18.1	-3.9	66.9	63.1
3. Rubber Tired Dozers	1	85	400	40	0.40	-18.1	-4.0	66.9	63.0
5. Tractors/Loaders/Backhoes	3	80	400	37	0.37	-18.1	-4.3	61.9	57.6
							Log Sum	73	69
BUILD									
1. Cranes	1	83	400	29	0.29	-18.1	-5.4	64.9	59.6
2. Forklifts	3	85	400	20	0.20	-18.1	-7.0	66.9	59.9
3. Generator Sets	1	82	400	74	0.74	-18.1	-1.3	63.9	62.6
4. Tractor/Loaders/Backhoes	3	80	400	37	0.37	-18.1	-4.3	61.9	57.6
5. Welders	1	73	400	45	0.45	-18.1	-3.5	54.9	51.5
							Log Sum	74	69
PAVE									
1. Pavers	1	85	400	42	0.42	-18.1	-3.8	66.9	63.2
2. Paving Equipment	2	85	400	36	0.36	-18.1	-4.4	66.9	62.5
3. Rollers	2	85	400	38	0.38	-18.1	-4.2	66.9	62.7
4. Cement and Mortar Mixers	2	85	400	56	0.56	-18.1	-2.5	66.9	64.4
5. Tractors/Loaders/Backhoes	1	80	400	37	0.37	-18.1	-4.3	61.9	57.6
							Log Sum	74	70
ARCH COAT									
1. Air Compressors	1	80	400	48	0.48	-18.1	-3.2	61.9	58.8
							Log Sum	62	59

Receptor - Residences to the East

A	B	C	D	E	F	G	H	I	J
Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA	Dist. To Recptr.	Item Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Recptr. Item Lmax, dBA	Recptr. Item Leq, dBA
DEMO									
1. Concrete/Industrial Saws	1	82	160	73	0.73	-10.1	-1.4	71.9	70.5
2. Excavators	3	85	160	38	0.38	-10.1	-4.2	74.9	70.7
3. Rubber Tired Dozers	2	85	160	40	0.40	-10.1	-4.0	74.9	70.9
							Log Sum	82	79
SITE PREP									
1. Tractors/Loaders/Backhoes	4	80	160	37	0.37	-10.1	-4.3	69.9	65.6
2. Rubber Tired Dozers	3	85	160	40	0.40	-10.1	-4.0	74.9	70.9
							Log Sum	81	77
GRADE									
1. Excavators	1	85	160	38	0.38	-10.1	-4.2	74.9	70.7
2. Graders	1	85	160	41	0.41	-10.1	-3.9	74.9	71.0
3. Rubber Tired Dozers	1	85	160	40	0.40	-10.1	-4.0	74.9	70.9
5. Tractors/Loaders/Backhoes	3	80	160	37	0.37	-10.1	-4.3	69.9	65.6
							Log Sum	81	77
BUILD									
1. Cranes	1	83	160	29	0.29	-10.1	-5.4	72.9	67.5
2. Forklifts	3	85	160	20	0.20	-10.1	-7.0	74.9	67.9
3. Generator Sets	1	82	160	74	0.74	-10.1	-1.3	71.9	70.6
4. Tractor/Loaders/Backhoes	3	80	160	37	0.37	-10.1	-4.3	69.9	65.6
5. Welders	1	73	160	45	0.45	-10.1	-3.5	62.9	59.4
							Log Sum	82	77
PAVE									
1. Pavers	1	85	160	42	0.42	-10.1	-3.8	74.9	71.1
2. Paving Equipment	2	85	160	36	0.36	-10.1	-4.4	74.9	70.5
3. Rollers	2	85	160	38	0.38	-10.1	-4.2	74.9	70.7
4. Cement and Mortar Mixers	2	85	160	56	0.56	-10.1	-2.5	74.9	72.4
5. Tractors/Loaders/Backhoes	1	80	160	37	0.37	-10.1	-4.3	69.9	65.6
							Log Sum	82	78
ARCH COAT									
1. Air Compressors	1	80	160	48	0.48	-10.1	-3.2	69.9	66.7
							Log Sum	70	67

Receptor - Commercial to the West

A	B	C	D	E	F	G	H	I	J
Construction Phase Equipment Item	# of Items	Item Lmax at 50 feet, dBA	Dist. To Recptr.	Item Usage Percent	Usage Factor	Dist. Correction dB	Usage Adj. dB	Recptr. Item Lmax, dBA	Recptr. Item Leq, dBA
DEMO									
1. Concrete/Industrial Saws	1	82	220	73	0.73	-12.9	-1.4	69.1	67.8
2. Excavators	3	85	220	38	0.38	-12.9	-4.2	72.1	67.9
3. Rubber Tired Dozers	2	85	220	40	0.40	-12.9	-4.0	72.1	68.2
							Log Sum	80	76
SITE PREP									
1. Tractors/Loaders/Backhoes	4	80	220	37	0.37	-12.9	-4.3	67.1	62.8
2. Rubber Tired Dozers	3	85	220	40	0.40	-12.9	-4.0	72.1	68.2
							Log Sum	78	74
GRADE									
1. Excavators	1	85	220	38	0.38	-12.9	-4.2	72.1	67.9
2. Graders	1	85	220	41	0.41	-12.9	-3.9	72.1	68.3
3. Rubber Tired Dozers	1	85	220	40	0.40	-12.9	-4.0	72.1	68.2
5. Tractors/Loaders/Backhoes	3	80	220	37	0.37	-12.9	-4.3	67.1	62.8
							Log Sum	78	74
BUILD									
1. Cranes	1	83	220	29	0.29	-12.9	-5.4	70.1	64.8
2. Forklifts	3	85	220	20	0.20	-12.9	-7.0	72.1	65.1
3. Generator Sets	1	82	220	74	0.74	-12.9	-1.3	69.1	67.8
4. Tractor/Loaders/Backhoes	3	80	220	37	0.37	-12.9	-4.3	67.1	62.8
5. Welders	1	73	220	45	0.45	-12.9	-3.5	60.1	56.7
							Log Sum	79	74
PAVE									
1. Pavers	1	85	220	42	0.42	-12.9	-3.8	72.1	68.4
2. Paving Equipment	2	85	220	36	0.36	-12.9	-4.4	72.1	67.7
3. Rollers	2	85	220	38	0.38	-12.9	-4.2	72.1	67.9
4. Cement and Mortar Mixers	2	85	220	56	0.56	-12.9	-2.5	72.1	69.6
5. Tractors/Loaders/Backhoes	1	80	220	37	0.37	-12.9	-4.3	67.1	62.8
							Log Sum	79	75
ARCH COAT									
1. Air Compressors	1	80	220	48	0.48	-12.9	-3.2	67.1	63.9
							Log Sum	67	64