Quick Quack Car Wash (Store #26-077)

Noise Impact Study

City of Roseville, CA

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1.0 Executive Summary

This report has been prepared to provide the calculated noise projections from the proposed Quick Quack Car Wash ("Project") located at 1590 Vineyard Road in the City of Roseville, CA. All calculations are compared to the City of Roseville's noise ordinance as well as the existing ambient condition. The Project proposes to construct a 128-foot covered car wash tunnel with 23 vacuum stalls.

1.1 Findings and Conclusions

Three (3) baseline 15-minute ambient measurements were performed at the Project site and represent the current operational noise and ambient levels within the Project vicinity. The predominant source of noise impacting the existing site is traffic noise propagating from Vineyard Road.

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

Project-only operational noise levels are anticipated to be 43-56 dBA Leq at residential uses north and northeast of the project site and 56 dBA Leq at the church to the south. The existing ambient noise level exceeds sound level standards for sensitive receptors, so the limit is the existing ambient plus 3 dBA. Project plus ambient noise level projections are anticipated to measure 57-61 dBA Leq and will increase the ambient level by 0-2 dBA, which meets the limit outlined within the City's Municipal Code (see Section 4.3).

This assessment evaluates the baseline noise condition and compares the Project's worst-case operational noise level to the measured noise level (during the Project's proposed hours of operation).

The following outlines the project design features:

1. The Project will incorporate 12 Sonny's blowers or equivalent.

2. An acoustic liner (Acoustiblok perforated metal panels or equivalent) will line 15' of the exit (see Appendix C).

2.0 Introduction

2.1 Purpose of Analysis and Study Objectives

This noise impact study aims to evaluate the potential noise impacts for the Project study area and recommend noise mitigation measures, if necessary, to minimize the potential noise impacts. The assessment was conducted and compared to potentially applicable noise standards set forth by the State and/or local agencies. Consistent with the City's Noise Guidelines, the Project must demonstrate compliance with the applicable noise zoning ordinance and sound attenuation requirements.

The following is provided in this report:

- A description of the study area and the proposed Project
- Information regarding the fundamentals of noise
- A description of the local noise guidelines and standards
- An evaluation of the existing ambient noise environment
- An analysis of stationary noise impact (e.g., blowers and vacuums) from the Project site to adjacent land uses
- An analysis of construction noise to adjacent uses

2.2 Site Location and Study Area

The Project site is at 1590 Vineyard Road in the City of Roseville, CA, as shown in Exhibit A. The land uses directly surrounding the Project are commercial to the north, east, and west, and Vineyard Road to the south. There is a church to the south and residential uses to the northeast and further north, east, and west.

2.3 Proposed Project Description

The Project proposes to develop a 128-foot car wash tunnel and 23 covered vacuum stall systems. The site plan used for this is illustrated in Exhibit B. The Project operational hours are assumed to be between 7 AM to 9 PM, seven days per week.

Exhibit A

Location Map

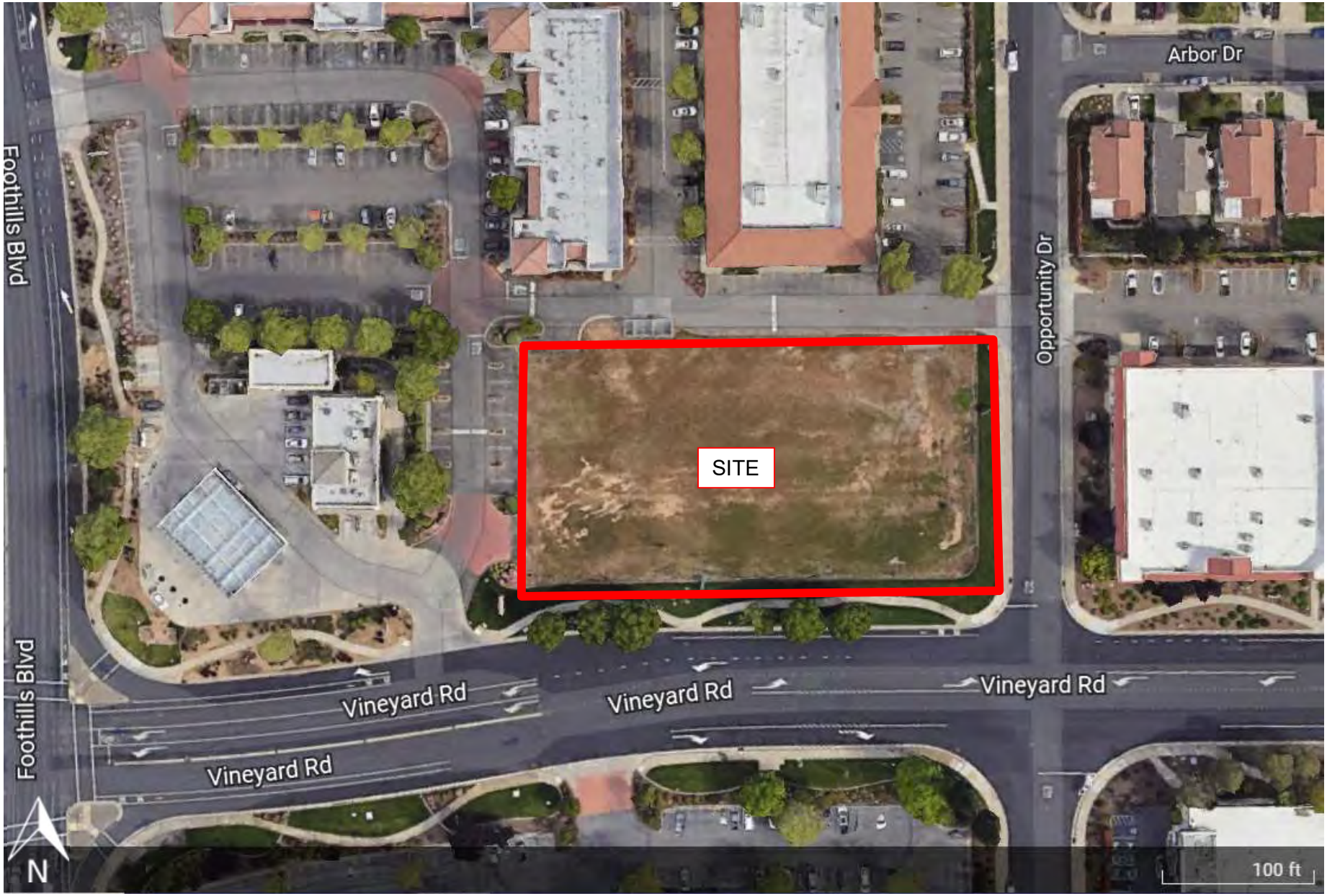
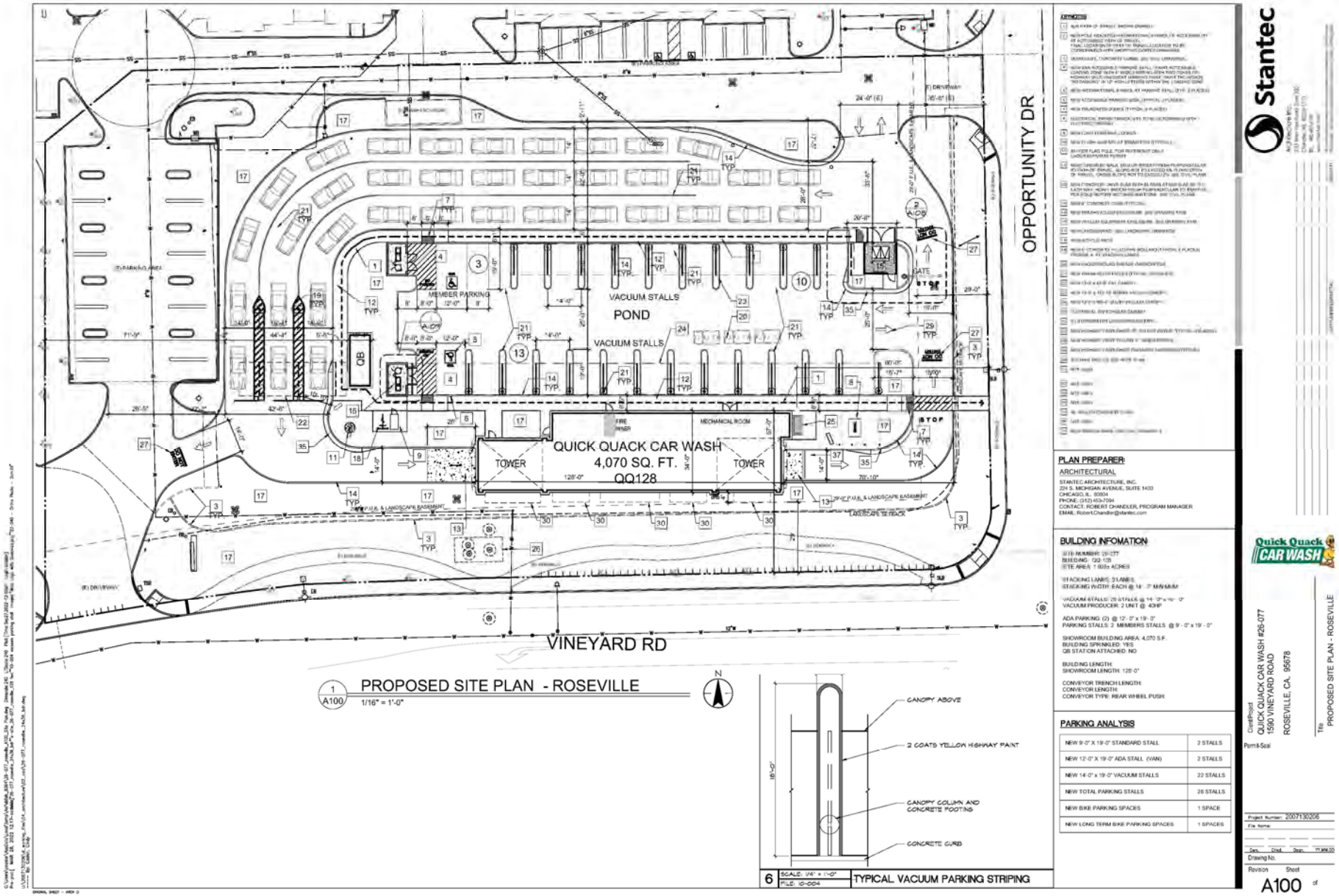


Exhibit B

Site Plan



3.0 Fundamentals of Noise

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

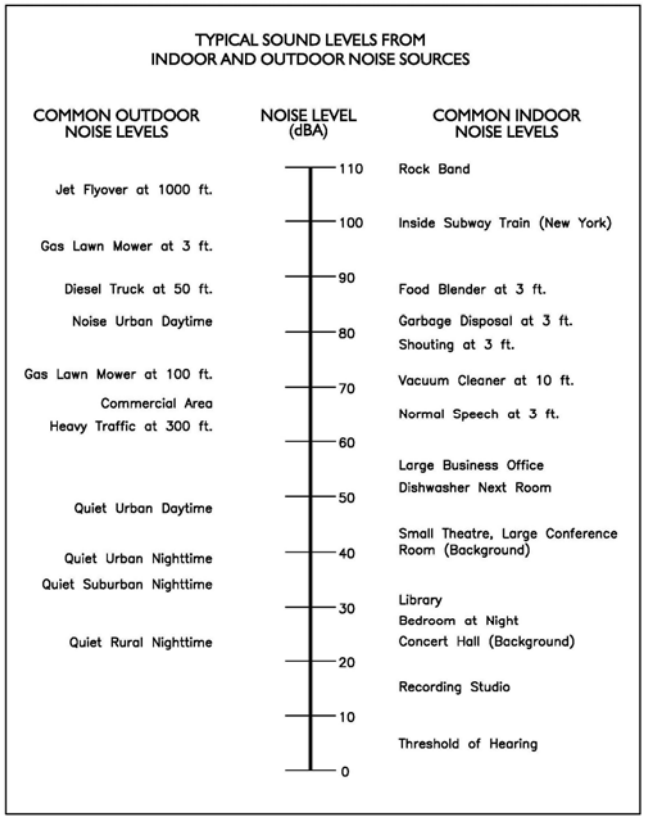
3.1 Sound, Noise, and Acoustics

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

3.2 Frequency and Hertz

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

Exhibit C: Typical A-Weighted Noise Levels



3.3 Sound Pressure Levels and Decibels

The *amplitude* of a sound determines its loudness. The loudness of sound increases or decreases as the amplitude increases or decreases. Sound pressure amplitude is measured in units of micro-Newton per square meter ($\mu N/m^2$), also called micro-Pascal (μPa). One μPa is approximately one hundred billionths (0.00000000001) of normal atmospheric pressure. Sound pressure level (SPL or L_p) is used to describe in logarithmic units the ratio of actual sound pressures to a reference pressure squared. These units are called decibels, abbreviated dB. Exhibit C illustrates reference sound levels for different noise sources.

3.4 Addition of Decibels

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

3.5 Human Response to Changes in Noise Levels

Generally, the healthy human ear is most sensitive to sounds between 1,000 Hz and 5,000 Hz (A-weighted scale). 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 traffic volume on a highway) would result in a barely perceptible change in sound level.

3.6 Noise Descriptors

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

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

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

Community Noise Equivalent Level (CNEL): The average equivalent A-weighted sound level during a 24-hour day, obtained after 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, L99, etc.

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

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

Percent Noise Levels: See L(n).

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

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

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

3.7 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 at least 200 feet from a noise source. Wind, temperature, air humidity, and turbulence can further impact how far sound can travel.

4.0 Regulatory Setting

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

4.1 Federal Regulations

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

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

The Federal Office of Noise Abatement and Control (ONAC) was originally tasked with implementing the Noise Control Act. However, it was eventually eliminated, leaving other federal agencies and committees to develop noise policies and programs. Some examples of these agencies are as follows: The Department of Transportation (DOT) assumed a significant role in noise control through its various agencies. The Federal Aviation Agency (FAA) is responsible for regulating noise from aircraft and airports. The Federal Highway Administration (FHWA) is responsible for regulating noise from the interstate highway system. The Occupational Safety and Health Administration (OSHA) is responsible for the prohibition of excessive noise exposure to workers. The Housing and Urban Development (HUD) is responsible for establishing noise regulations as it relates to exterior/interior noise levels for new HUD-assisted housing developments near high-noise areas.

The federal government advocates that local jurisdictions use their land use regulatory authority to arrange new development in such a way that "noise sensitive" uses are either prohibited from being constructed adjacent to a highway or 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 of the California Building Code (CBC), which in some cases requires acoustical analyses to outline exterior noise levels and

to ensure interior noise levels do not exceed the interior threshold. The state mandates that the legislative body of each county and City adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. The guidelines rank noise land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable, as illustrated in Exhibit D.

4.3 City of Roseville Noise Regulations

The City of Roseville outlines their noise regulations and standards within the Noise Element from the General Plan and Municipal Code. For purposes of this analysis, the City's General Plan and Noise Ordinance (Chapter 9.24) is used to evaluate the stationary noise impacts from the proposed Project. The Noise Element outlines Goals and Polices and establishes Noise/Land Use Compatibility Criteria. This assessment will compare the project noise levels to the residential noise limits since the proposed Project is located directly adjacent to existing residential land uses. The project impacts were compared to the City's residential noise standards.

City of Roseville General Plan

The City has outlined goals, policies, and implementation measures to reduce potential noise impacts, which are presented below:

Goals, Policies, and Implementation Measures

Policies and goals from the noise section that would mitigate potential impacts on noise include the following.

N1.1 *The City's exterior noise compatibility standards for uses affected by transportation noise sources are included as Table IX-1* (Exhibit D)*. Exterior noise levels shall be mitigated to the extent feasible using site planning, building orientation, and/or other construction techniques or design features. Noise barriers should only be used after other feasible noise reduction strategies are exhausted, and not where they would interrupt existing or future community pedestrian or bicycle connectivity.*

N1.2 *The City's interior noise compatibility standards for uses affected by transportation noise sources are 45 dBA Ldn for noise-sensitive uses such as residences, lodging, hospitals, assisted living facilities, and other places where people normally sleep. For noise-sensitive uses where people do not sleep, such as offices, schools, and uses with similar noise sensitivity, noise levels should be no greater than 45 dBA Leq. Proposed projects should incorporate noise reduction strategies, if necessary, to achieve these interior noise levels.*

N1.3 *The City's exterior noise compatibility standards for uses affected by nontransportation-related noise are defined within the City's Noise Ordinance, and should be applied consistent with the Noise Ordinance.*

N1.5 *If existing noise levels exceed the noise compatibility standards in Table IX-1 or Policy N1.2, then feasible methods of reducing noise to levels consistent with standards should be considered, but are not required. However if existing noise levels exceed noise compatibility standards and a project results in a significant increase in noise (as defined below), then feasible methods of reducing noise to avoid a significant noise increase should be applied. In no case should a project result in a Clearly Unacceptable noise level according to Table IX-1*.

- *Where existing exterior noise is less than 60 dB, a ≥ 5 dBA increase in noise is significant.*
- *Where existing exterior noise is between 60 and 65 dBA, a ≥ 3 dB increase in noise is significant.*
- *Where existing exterior noise is greater than 65 dB a ≥ 1.5 dBA increase in noise is significant.*

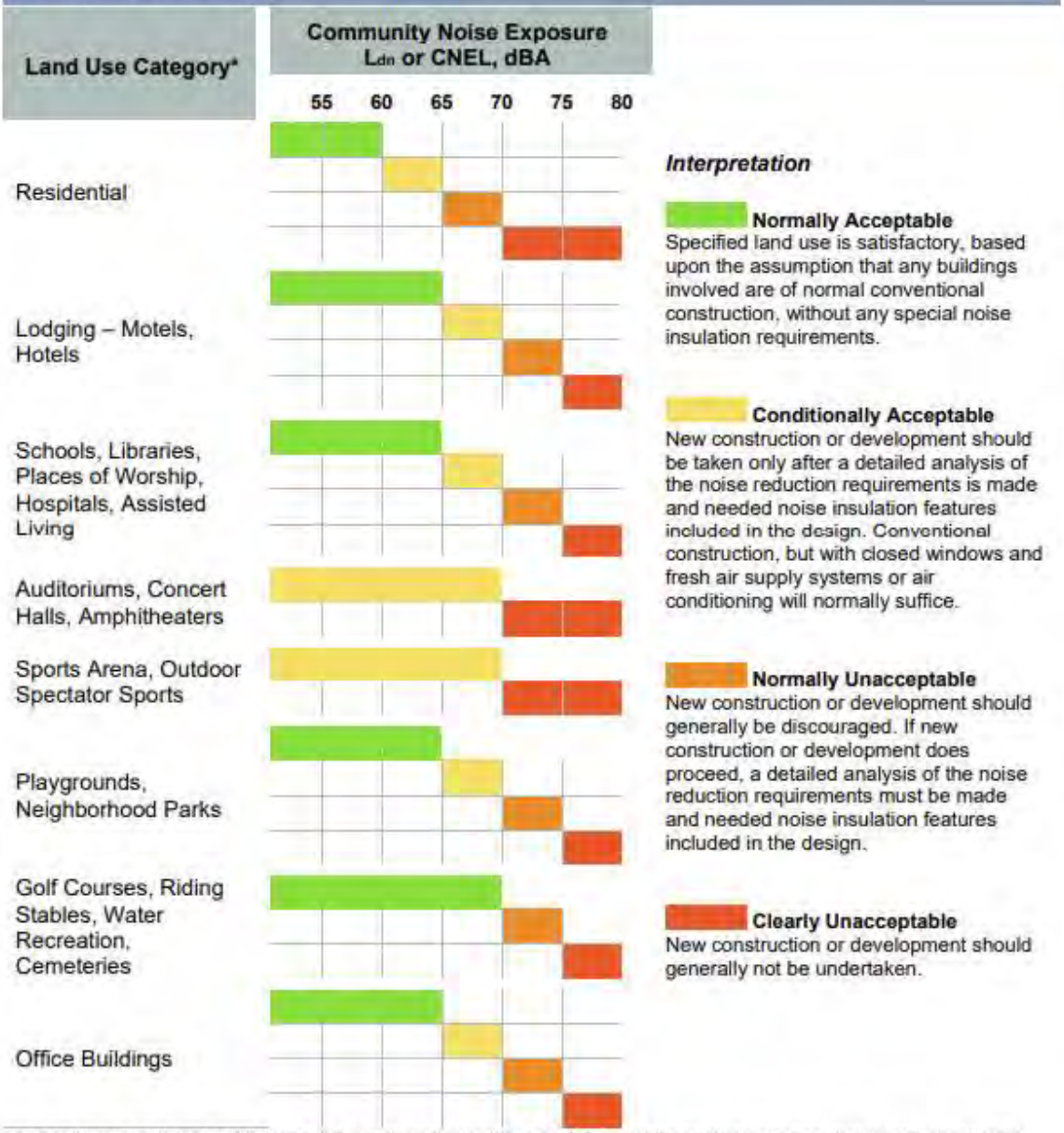
N1.6 *In order to facilitate reinvestment and economic development, if noise mitigation is found to be infeasible or in conflict with other City policies regarding community design, the City may elect to allow noise levels that exceed the noise standards identified in Table IX-1, although in no case should application of this policy result in a Clearly Unacceptable noise level according to Table IX-1.*

N1.9 *Construction-related noise that is consistent with the City's Noise Ordinance is exempt from the noise standards outlined in this Element.*

N1.10 *Include all feasible measures necessary, as a part of proposed development and public infrastructure projects, to avoid substantial annoyance for adjacent vibration-sensitive uses, consistent with California Department of Transportation and Federal Transit Agency guidance.*

Exhibit D: Land Use Compatibility Guidelines

Table IX-1 | Exterior Noise Compatibility Standards for Uses Affected by Transportation Noise



* Land uses not listed on this table will be evaluated according to guidance for the land use category that is most similar with regard to noise sensitivity. The land use-noise compatibility standards apply to outdoor (exterior) activity areas associated with each land use. Outdoor activity areas are the portion of a noise-sensitive property where outdoor activities would normally be expected. Outdoor activity areas for the purposes of this element do not include gathering spaces alongside transportation corridors or associated public rights-of-way.

City of Roseville Municipal Code

The City's noise ordinance is found in Chapter 9.24 – Noise Regulation.

Section 9.24.020 – Definitions.

"Sensitive receptor" means a land use in which there is a reasonable degree of sensitivity to noise. Such uses include single-family and multifamily residential uses, schools, hospitals, churches, rest homes, cemeteries, public libraries and other sensitive uses as determined by the enforcement officer.

Section 9.24.030 – Exemptions.

Sound or noise emanating from the following sources and activities are exempt from the provisions of this title:

G. Private construction (e.g., construction, alteration or repair activities) between the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday, and between the hours of 8:00 a.m. and 8:00 p.m. Saturday and Sunday; provided, however, that all construction equipment shall be fitted with factory installed muffling devices and that all construction equipment shall be maintained in good working order.

Section 9.24.100 – Sound limits for sensitive receptors.

It is unlawful for any person at any location to create any sound, or to allow the creation of any sound, on property owned, leased, occupied or otherwise controlled by such person, which causes the exterior sound level when measured at the property line of any affected sensitive receptor to exceed the ambient sound level by three dBA or exceed the sound level standards as set forth in Table 1, by three dBA, whichever is greater.

Table 1: Sound Level Standards (for non-transportation or fixed sources)

SOUND LEVEL DESCRIPTOR	DAYTIME (7 a.m. - 10 p.m.)	NIGHTTIME (10 p.m. - 7 a.m.)
Hourly Leq, dBA	50	45
Maximum level, dBA	70	65

a. Each of the sound level standards specified in Table 1 shall be reduced by five dB for simple tone noises, consisting of speech and music. However, in no case shall the sound level standard be lower than the ambient sound level plus three dB.

9.24.160 – Exceptions.

If the applicant can show to the city manager, or his or her designee that a diligent investigation of available sound suppression techniques for construction-related noise indicates that immediate compliance with the requirements of this chapter would be impractical or unreasonable, due to the temporary nature or short duration of the exception, a permit to allow exception from the provisions

contained in all or a portion of this chapter may be issued. Factors that the approving authority must consider for construction related exceptions shall include but not be limited to the following:

1. Conformance with the intent of this chapter;
2. Uses of property and existence of sensitive receptors within the area affected by sound;
3. Factors related to initiating and completing all remedial work;
4. The time of the day or night the exception will occur;
5. The duration of the exception; and
6. The general public interest, welfare and safety.

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

MD conducted three (3) short-term noise measurement at the Project site, representing the noise level from the traffic conditions along Vineyard Road and Opportunity Drive (see Appendix A for the field sheet data).

5.2 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 (vacuums and car wash blowers at the exit). The SP model assumes a total of 23 vacuums and the dryer systems are operating simultaneously (worst-case scenario) when the noise will, in reality, be intermittent and lower in noise level. In addition, the modeling takes into account the louver, windows, and openings on the car wash tunnel based on the plan elevations. The reference vacuum equipment and blower system sound level data are provided in Appendix C.

All other noise-producing equipment (e.g., compressors, pumps) will be housed within mechanical equipment rooms.

The following outlines the project design features:

1. The Project will incorporate a 12 Sonny's blower system or equivalent to meet these acoustical benchmarks.

2. An acoustic liner (Acoustiblok perforated metal panels or equivalent) will line 15' of the exit (see Appendix C).

6.0 Existing Noise Environment

Three (3) 15-minute ambient noise measurements were taken at the project site to determine the existing ambient noise levels. Noise data indicates that traffic along Vineyard Road and Opportunity Drive is the primary source of noise impacting the site and the surrounding area.

6.1 Short-Term Noise Measurement Results

The results of the 15-minute measurements are presented in Table 1.

Table 1: Short-Term Noise Measurement Data (dBA)

Location	Start Time	Stop Time	Leq	Lmax	Lmin	L(2)	L(8)	L(25)	L(50)	L(90)
ST-1	11:59 AM	12:14 PM	58.4	77.6	46.4	65.0	61.7	57.4	53.9	49.9
ST-2	12:19 PM	12:34 PM	57.0	71.0	45.3	65.9	60.8	56.2	52.7	58.6
ST-3	12:40 PM	12:55 PM	59.6	75.3	49.3	66.3	62.3	59.6	57.3	53.2

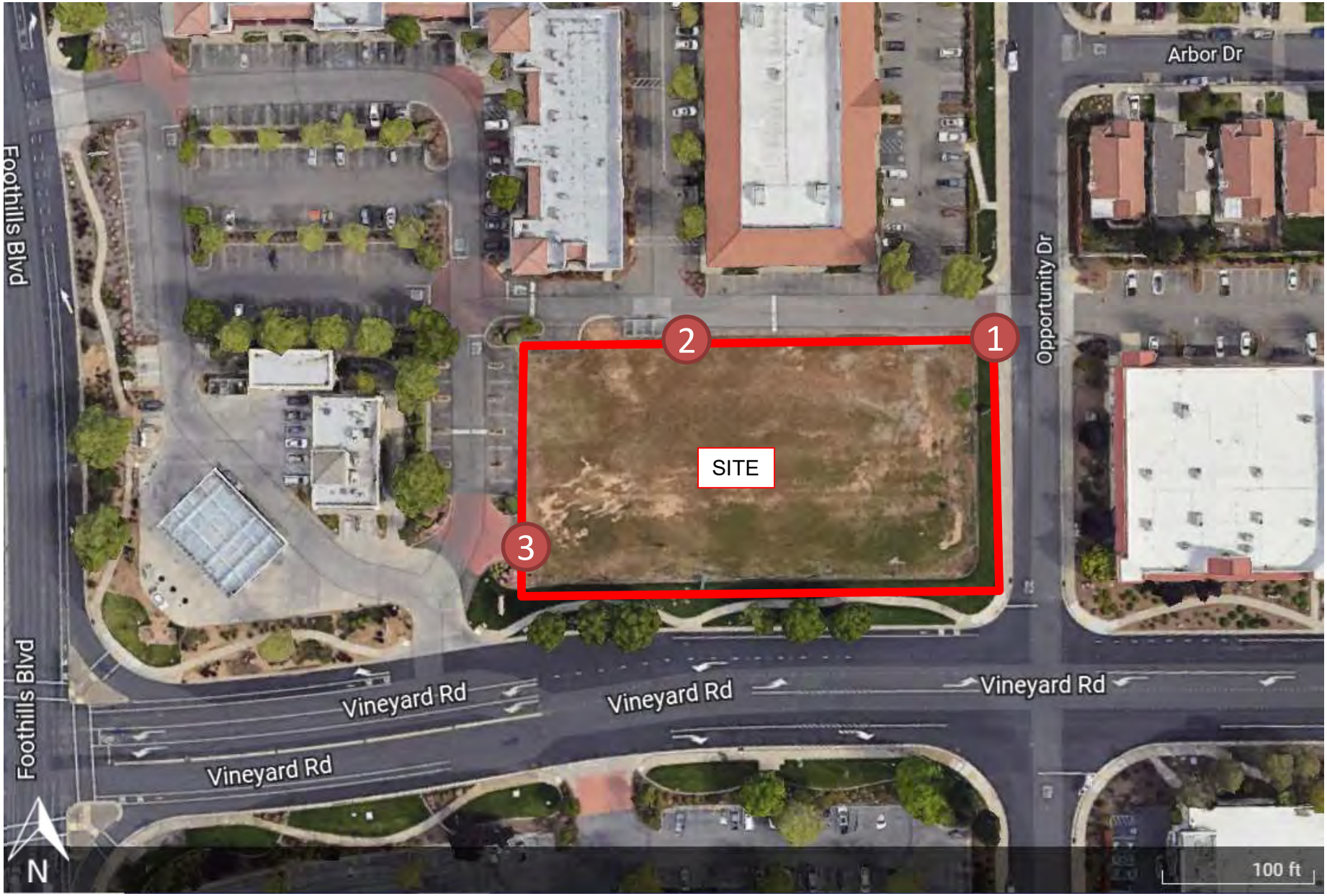
Notes:
1. Short-term noise monitoring locations are illustrated in Exhibit E.

For this evaluation, MD has utilized the measured ambient noise level of 57-60 dBA Leq and has compared them to the Project's projected noise levels.

Exhibit E

Measurement Locations

= Short-Term Monitoring Location



7.0 Future Noise Environment Impacts

This assessment analyzes future noise impacts as a result of the Project. The analysis details the estimated exterior noise levels. Stationary noise impacts are analyzed from the noise sources on-site such as dryers/blowers and vacuums.

7.1 Stationary Source Noise

The following sections outline the exterior noise levels associated with the proposed Project.

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

Sensitive receptors affected by Project operational noise include existing residences to the north and northeast and a church to the south. The worst-case stationary noise was modeled using SoundPLAN acoustical modeling software. Worst-case assumes the blowers, vacuums, and equipment are always operational when in reality, the noise will be intermittent and cycle on/off depending on the customer usage.

A total of four (4) sensitive receptors (R1 – R4) were modeled to evaluate the proposed Project's operational impact. This study analyzes the Project-only operational noise level projections and the Project plus ambient noise level projections; see Table 3 below.

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

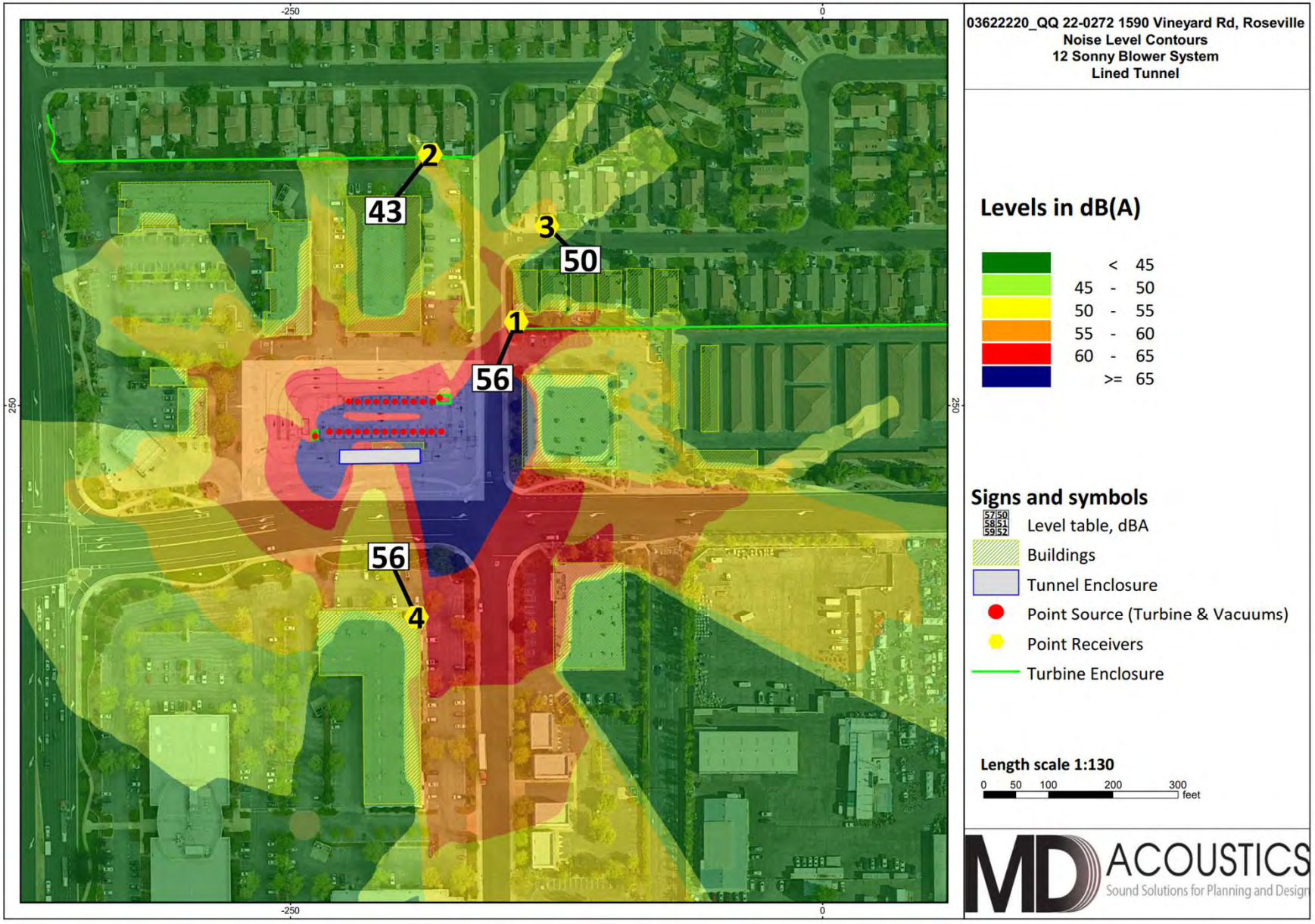
Receptor[1]	Existing Ambient Noise Level (dBA, Leq)[2]	Project Noise Level (dBA, Leq)[3]	Total Combined Noise Level (dBA, Leq)	Daytime (7AM - 10PM) Non Transp. Noise Limit (dBA, Leq)	Change in Noise Level as Result of Project
1	58	56	60	**61**	2
2	57	43	57	**60**	0
3	57	50	58	**60**	1
4	60	56	61	**63**	1

Notes:
1. Receptors 1 thru 4 represent sensitive receptors.
2. See Appendix A for the ambient noise measurement.
3. See Exhibit F for the operational noise level projections at said receptors.

The model indicates that the project-only noise level at the existing residences and church will be 43-56 dBA. Section 9.24.100 of the City's Municipal Code states that if the ambient noise level is above the specified sound level standard, then the new standard is the ambient noise level plus three. The project noise will increase the ambient noise at the existing sensitive receptors by a maximum of 2 dBA. This level meets the City's noise standard for sensitive receptors.

Exhibit F

Operational Noise Level Contours



8.0 References

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

City of Roseville: General Plan 2035

City of Roseville: Municipal Code Chapter 9.24

Appendix A:
Field Measurement Data

15-Minute Continuous Noise Measurement Datasheet

Project Name:	QQ 22-0272 1590 Vineyard Rd
Project: #/Name:	0362-2022-020
Site Address/Location:	1590 Vineyard Rd
Date:	09/29/2022
Field Tech/Engineer:	Dennis Jordan / Claire Pincock

Site Observations:

81° to 82°, sunny and clear, winds 5 to 10 mph, light to moderate traffic with a few loud vehicles

Sound Meter:	XL2, NTI	**SN:**	A2A-05967-E0
Settings:	A-weighted, slow, 1-sec, 15-minute interval		
Site Id:	ST-1, ST-2, ST-3		

MD ACOUSTICS

15-Minute Continuous Noise Measurement Datasheet - Cont.

Project Name: QQ 22-0272 1590 Vineyard Rd

Site Address/Location: 1590 Vineyard Rd

Site Id: ST-1, ST-2, ST-3

Figure 1: ST-1 N/E corner of prop site, 21 ft from Opportunity Dr

Figure 2: ST-2 N of site 194 ft from Opportunity Dr

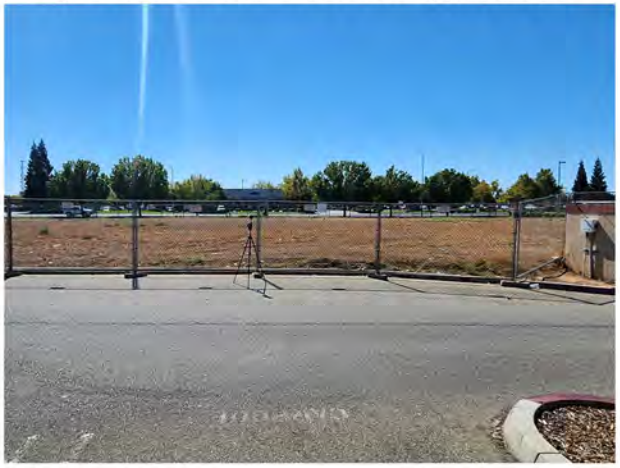


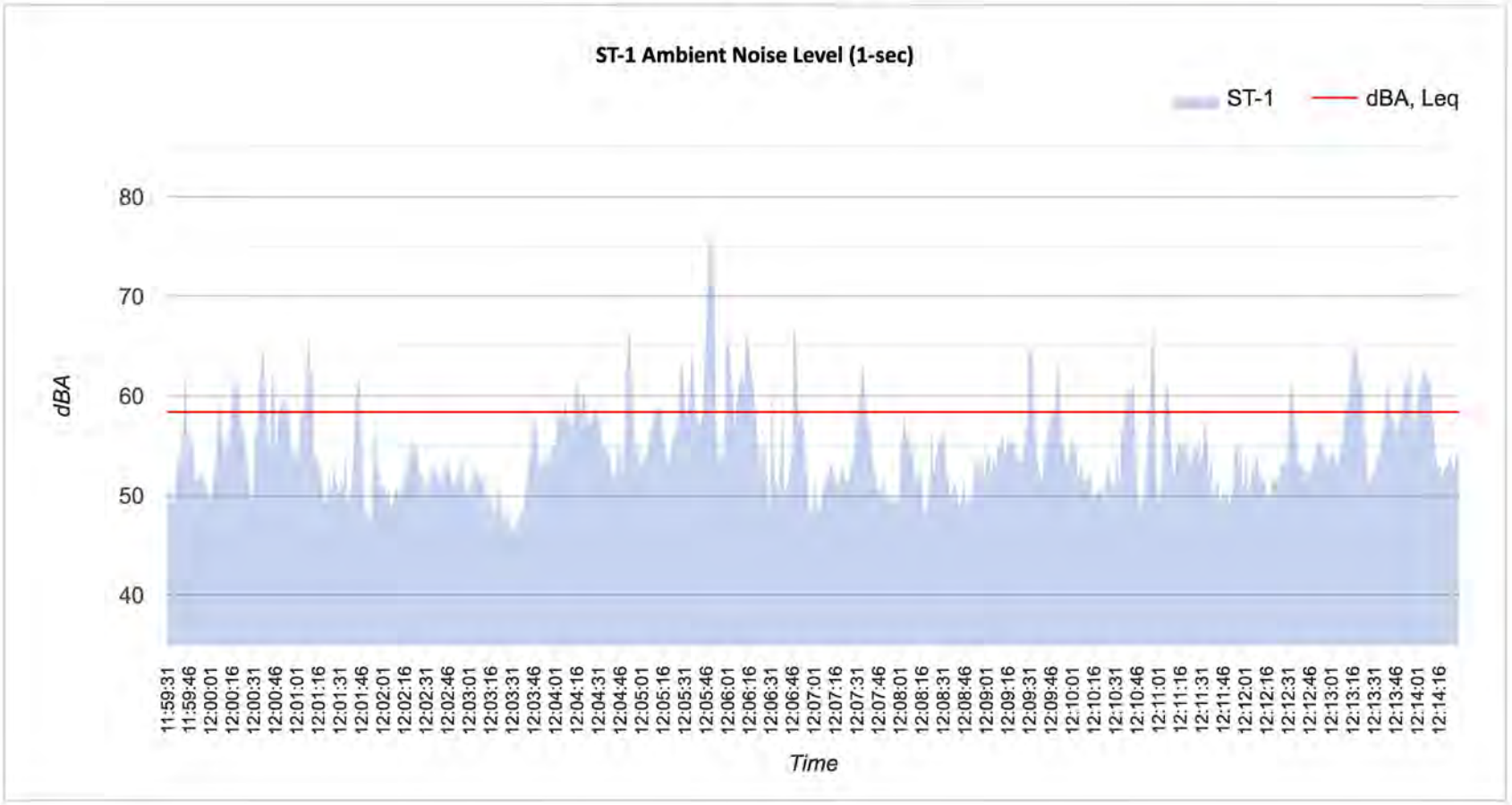
Figure 3: ST-3 W of site 67 ft from Vineyard

Table 1: Baseline Noise Measurement Summary

Location	Start	Stop	Leq	Lmax	Lmin	L2	L8	L25	L50	L90
ST-1	11:59 AM	12:14 PM	58.4	77.6	46.4	65	61.7	57.4	53.9	49.9
ST-2	12:19 PM	12:34 PM	57	71.0	45.3	65.9	60.8	56.2	52.7	48.6
ST-3	12:40 PM	12:55 PM	59.6	75.3	49.3	66.3	62.3	59.6	57.3	53.2

15-Minute Continuous Noise Measurement Datasheet - Cont.

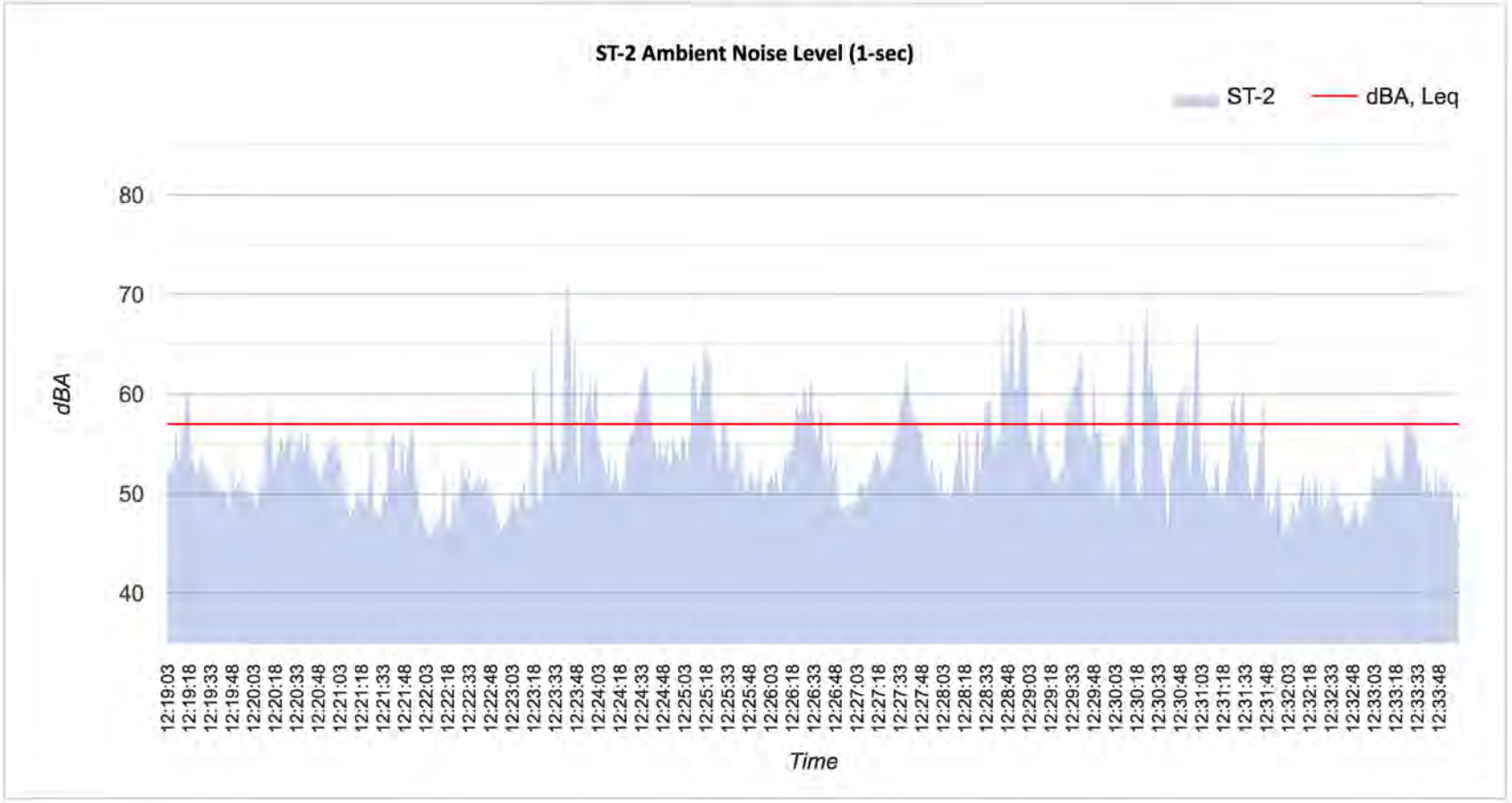
Project Name:	QQ 22-0272 1590 Vineyard Rd	**Site Topo:**	Buildings 1 to 2 stories tall	**Noise Source(s) w/ Distance:**
Site Address/Location:	1590 Vineyard Rd	**Meteorological Cond.:**	81° , winds 5-10 mph, sunny and clear	Road Noise / 21 ft from Opportuniy Dr
Site Id:	ST-1	**Ground Type:**	Buildings, Cement, Asphalt, Dirt and Vegetation	



MD ACOUSTICS

15-Minute Continuous Noise Measurement Datasheet - Cont.

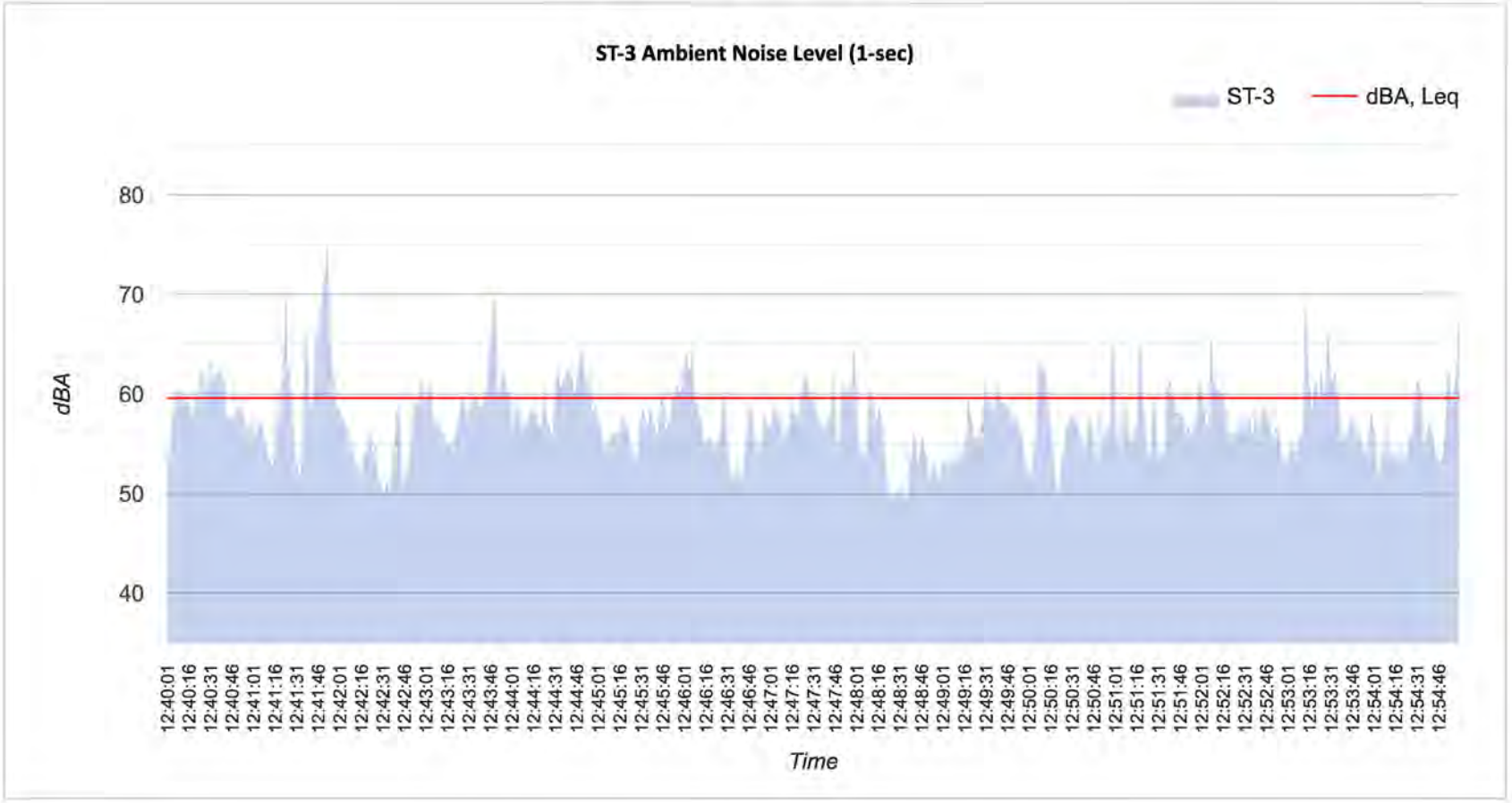
Project Name:	QQ 22-0272 1590 Vineyard Rd	**Site Topo:**	Buildings 1 to 2 stories tall	**Noise Source(s) w/ Distance:**	
Site Address/Location:	1590 Vineyard Rd	**Meteorological Cond.:**	82° , winds 5-10 mph, sunny and clear	Road Noise / 194 ft from Opportuniy Dr	
Site Id:	ST-2	**Ground Type:**	Buildings, Cement, Asphalt, Dirt and Vegetation		



MD ACOUSTICS

15-Minute Continuous Noise Measurement Datasheet - Cont.

Project Name:	QQ 22-0272 1590 Vineyard Rd	**Site Topo:**	Buildings 1 to 2 stories tall	**Noise Source(s) w/ Distance:**	
Site Address/Location:	1590 Vineyard Rd	**Meteorological Cond.:**	82° , winds 5-10 mph, sunny and clear	Road Noise / 67 ft from Vineyard	
Site Id:	ST-3	**Ground Type:**	Buildings, Cement, Asphalt, Dirt and Vegetation		



MD ACOUSTICS

Appendix B:

SoundPLAN Input/Outputs

QQ 22-0272 1590 Vineyard Rd, Roseville
Contribution level - 002 - 12 Sonny - Lined: Outdoor SP

Source	Source ty	Leq,d dB(A)
Receiver R1 Fl G Lr,lim dB(A) Leq,d 56.1 dB(A) Sigma(Leq,d) 0.0 dB(A)		
001 - 12 Sonny - Standard Tunnel-Transmissive area 01	Area	55.7
001 - 12 Sonny - Standard Tunnel-Transmissive area 01	Area	39.0
Vac	Point	33.2
Vac	Point	32.6
Vac	Point	32.1
Vac	Point	31.5
Vac	Point	31.3
Vac	Point	31.3
Vac	Point	30.9
Vac	Point	30.8
Vac	Point	30.7
Vac	Point	30.6
Vac	Point	30.4
Vac	Point	30.1
Vac	Point	30.0
Vac	Point	29.8
Vac	Point	29.7
Vac	Point	29.5
Vac	Point	29.4
Vac	Point	29.1
Vac	Point	28.8
Vac	Point	28.5
Vac	Point	28.1
Vac	Point	27.9
Vac	Point	24.7
Turbine	Point	22.7
Turbine	Point	13.4
001 - 12 Sonny - Standard Tunnel-Facade 03	Area	6.8
001 - 12 Sonny - Standard Tunnel-Roof 01	Area	6.7
001 - 12 Sonny - Standard Tunnel-Facade 02	Area	5.6
001 - 12 Sonny - Standard Tunnel-Transmissive area 05	Area	1.8
001 - 12 Sonny - Standard Tunnel-Facade 01	Area	-4.3
001 - 12 Sonny - Standard Tunnel-Transmissive area 03	Area	-7.9
001 - 12 Sonny - Standard Tunnel-Transmissive area 04	Area	-9.3
001 - 12 Sonny - Standard Tunnel-Facade 04	Area	-9.9
Receiver R2 Fl G Lr,lim dB(A) Leq,d 43.4 dB(A) Sigma(Leq,d) 0.0 dB(A)		
001 - 12 Sonny - Standard Tunnel-Transmissive area 01	Area	43.1
001 - 12 Sonny - Standard Tunnel-Transmissive area 01	Area	23.6
Vac	Point	23.2
Vac	Point	22.8
Vac	Point	22.4
Vac	Point	21.4
Vac	Point	18.8

Source	Source ty	Leq,d dB(A)	
Vac	Point	18.1	
Vac	Point	18.1	
Vac	Point	17.1	
Vac	Point	16.5	
Vac	Point	16.1	
Vac	Point	15.3	
Vac	Point	14.5	
Vac	Point	14.3	
Vac	Point	13.9	
Vac	Point	13.9	
Vac	Point	13.5	
Turbine	Point	13.5	
Vac	Point	13.1	
Vac	Point	12.7	
Vac	Point	12.5	
Vac	Point	12.5	
Vac	Point	12.0	
Vac	Point	11.7	
Vac	Point	10.7	
Turbine	Point	3.3	
001 - 12 Sonny - Standard Tunnel-Roof 01	Area	-4.0	
001 - 12 Sonny - Standard Tunnel-Transmissive area 05	Area	-6.4	
001 - 12 Sonny - Standard Tunnel-Facade 02	Area	-7.3	
001 - 12 Sonny - Standard Tunnel-Facade 03	Area	-7.5	
001 - 12 Sonny - Standard Tunnel-Facade 01	Area	-11.2	
001 - 12 Sonny - Standard Tunnel-Transmissive area 03	Area	-14.0	
001 - 12 Sonny - Standard Tunnel-Transmissive area 04	Area	-14.7	
001 - 12 Sonny - Standard Tunnel-Facade 04	Area	-21.0	
Receiver R3 Fl G Lr,lim dB(A) Leq,d 50.1 dB(A) Sigma(Leq,d) 0.0 dB(A)			
001 - 12 Sonny - Standard Tunnel-Transmissive area 01	Area	49.6	
001 - 12 Sonny - Standard Tunnel-Transmissive area 01	Area	34.2	
Vac	Point	27.6	
Vac	Point	27.5	
Vac	Point	27.3	
Vac	Point	27.1	
Vac	Point	27.1	
Vac	Point	26.9	
Vac	Point	26.8	
Vac	Point	26.7	
Vac	Point	26.6	
Vac	Point	26.4	
Vac	Point	26.4	
Vac	Point	26.4	
Vac	Point	26.2	
Vac	Point	26.1	

Source	Source ty	Leq,d dB(A)	
Vac	Point	25.5	
Vac	Point	23.3	
Vac	Point	23.2	
Vac	Point	23.2	
Vac	Point	21.7	
Vac	Point	21.4	
Vac	Point	20.9	
Vac	Point	16.2	
Vac	Point	15.3	
Turbine	Point	9.7	
Turbine	Point	8.9	
001 - 12 Sonny - Standard Tunnel-Facade 03	Area	3.9	
001 - 12 Sonny - Standard Tunnel-Roof 01	Area	1.8	
001 - 12 Sonny - Standard Tunnel-Facade 02	Area	-3.2	
001 - 12 Sonny - Standard Tunnel-Transmissive area 05	Area	-4.9	
001 - 12 Sonny - Standard Tunnel-Facade 01	Area	-8.6	
001 - 12 Sonny - Standard Tunnel-Facade 04	Area	-12.5	
001 - 12 Sonny - Standard Tunnel-Transmissive area 03	Area	-13.0	
001 - 12 Sonny - Standard Tunnel-Transmissive area 04	Area	-14.0	
Receiver R4 Fl G Lr,lim dB(A) Leq,d 55.5 dB(A) Sigma(Leq,d) 0.0 dB(A)			
001 - 12 Sonny - Standard Tunnel-Transmissive area 01	Area	55.3	
001 - 12 Sonny - Standard Tunnel-Transmissive area 01	Area	39.8	
Vac	Point	32.3	
Vac	Point	31.6	
Vac	Point	30.2	
Vac	Point	22.4	
Vac	Point	22.3	
Vac	Point	21.7	
Vac	Point	21.1	
Turbine	Point	20.6	
Vac	Point	20.5	
Vac	Point	20.5	
Vac	Point	20.1	
Vac	Point	19.8	
Vac	Point	19.7	
Vac	Point	19.5	
Vac	Point	19.1	
Vac	Point	19.1	
Vac	Point	19.0	
Vac	Point	19.0	
Vac	Point	18.7	
Vac	Point	18.5	
Vac	Point	18.4	
Vac	Point	17.7	
Vac	Point	17.6	

QQ 22-0272 1590 Vineyard Rd, Roseville
Contribution level - 002 - 12 Sonny - Lined: Outdoor SP

Source	Source ty	Leq,d dB(A)	
Vac	Point	17.6	
001 - 12 Sonny - Standard Tunnel-Facade 01	Area	15.9	
Turbine	Point	15.0	
001 - 12 Sonny - Standard Tunnel-Transmissive area 04	Area	12.1	
001 - 12 Sonny - Standard Tunnel-Roof 01	Area	10.6	
001 - 12 Sonny - Standard Tunnel-Facade 02	Area	6.1	
001 - 12 Sonny - Standard Tunnel-Transmissive area 05	Area	5.7	
001 - 12 Sonny - Standard Tunnel-Facade 03	Area	-0.6	
001 - 12 Sonny - Standard Tunnel-Facade 04	Area	-5.0	
001 - 12 Sonny - Standard Tunnel-Transmissive area 03	Area	-5.0	

QQ 22-0272 1590 Vineyard Rd, Roseville
Octave spectra of the sources in dB(A) - 002 - 12 Sonny - Lined: Outdoor SP

3

Name	Source type	I or A m,m²	Li dB(A)	R'w dB	L'w dB(A)	Lw dB(A)	DO-Wall dB	Emission spectrum	63Hz dB(A)	125Hz dB(A)	250Hz dB(A)	500Hz dB(A)	1kHz dB(A)	2kHz dB(A)	4kHz dB(A)	8kHz dB(A)	16kHz dB(A)
001 - 12 Sonny - Standard Tunnel-Facade 01	Area	200.85	92.4	57.0	38.0	61.0	3	117_Facade 01		47.5	56.8	57.7	49.4	45.3	33.9		
001 - 12 Sonny - Standard Tunnel-Facade 02	Area	29.50	97.7	57.0	42.3	57.0	3	118_Facade 02_		43.9	52.1	53.9	46.6	42.8	31.3		
001 - 12 Sonny - Standard Tunnel-Facade 03	Area	199.57	92.4	57.0	38.0	61.0	3	119_Facade 03_		47.5	56.8	57.7	49.4	45.4	33.9		
001 - 12 Sonny - Standard Tunnel-Facade 04	Area	23.80	87.5	57.0	36.7	50.4	3	120_Facade 04		34.7	47.6	46.8	33.4	22.8	8.5		
001 - 12 Sonny - Standard Tunnel-Roof 01	Area	218.03	93.0	57.0	38.6	61.9	0	115_Roof 01_		48.3	57.7	58.8	50.4	46.4	34.9		
001 - 12 Sonny - Standard Tunnel-Transmissive area 01	Area	15.61	87.5	0.0	87.5	99.4	3	103_Transmissive area 01		76.7	91.7	97.0	92.6	85.8	74.5		
001 - 12 Sonny - Standard Tunnel-Transmissive area 01	Area	9.28	96.7	0.0	96.7	106.4	3	100_Transmissive area 01		82.6	92.3	99.8	101.5	101.8	93.4		
001 - 12 Sonny - Standard Tunnel-Transmissive area 03	Area	27.48	97.4	57.0	42.0	56.4	3	104_Transmissive area 03_		43.2	51.6	53.4	45.9	42.2	31.0		
001 - 12 Sonny - Standard Tunnel-Transmissive area 04	Area	27.48	97.6	57.0	42.3	56.6	3	105_Transmissive area 04_		43.3	51.8	53.6	46.2	42.5	31.2		
001 - 12 Sonny - Standard Tunnel-Transmissive area 05	Area	29.17	97.4	57.0	42.1	56.7	0	106_Transmissive area 05_		43.6	51.9	53.6	46.2	42.4	31.1		
Turbine	Point				81.0	81.0	0	Vacutech Turbine	55.7	65.9	62.9	60.3	64.2	67.9	74.5	77.7	73.5
Turbine	Point				81.0	81.0	0	Vacutech Turbine	55.7	65.9	62.9	60.3	64.2	67.9	74.5	77.7	73.5
Vac	Point				81.0	81.0	0	Vacutech - in car	62.4	69.2	75.8	72.6	71.3	73.2	72.6	67.8	59.2
Vac	Point				81.0	81.0	0	Vacutech - in car	62.4	69.2	75.8	72.6	71.3	73.2	72.6	67.8	59.2
Vac	Point				81.0	81.0	0	Vacutech - in car	62.4	69.2	75.8	72.6	71.3	73.2	72.6	67.8	59.2
Vac	Point				81.0	81.0	0	Vacutech - in car	62.4	69.2	75.8	72.6	71.3	73.2	72.6	67.8	59.2
Vac	Point				81.0	81.0	0	Vacutech - in car	62.4	69.2	75.8	72.6	71.3	73.2	72.6	67.8	59.2
Vac	Point				81.0	81.0	0	Vacutech - in car	62.4	69.2	75.8	72.6	71.3	73.2	72.6	67.8	59.2
Vac	Point				81.0	81.0	0	Vacutech - in car	62.4	69.2	75.8	72.6	71.3	73.2	72.6	67.8	59.2
Vac	Point				81.0	81.0	0	Vacutech - in car	62.4	69.2	75.8	72.6	71.3	73.2	72.6	67.8	59.2
Vac	Point				81.0	81.0	0	Vacutech - in car	62.4	69.2	75.8	72.6	71.3	73.2	72.6	67.8	59.2
Vac	Point				81.0	81.0	0	Vacutech - in car	62.4	69.2	75.8	72.6	71.3	73.2	72.6	67.8	59.2
Vac	Point				81.0	81.0	0	Vacutech - in car	62.4	69.2	75.8	72.6	71.3	73.2	72.6	67.8	59.2
Vac	Point				81.0	81.0	0	Vacutech - in car	62.4	69.2	75.8	72.6	71.3	73.2	72.6	67.8	59.2
Vac	Point				81.0	81.0	0	Vacutech - in car	62.4	69.2	75.8	72.6	71.3	73.2	72.6	67.8	59.2
Vac	Point				81.0	81.0	0	Vacutech - in car	62.4	69.2	75.8	72.6	71.3	73.2	72.6	67.8	59.2
Vac	Point				81.0	81.0	0	Vacutech - in car	62.4	69.2	75.8	72.6	71.3	73.2	72.6	67.8	59.2

Name	Source type	I or A m,m²	Li dB(A)	R'w dB	L'w dB(A)	Lw dB(A)	DO-Wall dB	Emission spectrum	63Hz dB(A)	125Hz dB(A)	250Hz dB(A)	500Hz dB(A)	1kHz dB(A)	2kHz dB(A)	4kHz dB(A)	8kHz dB(A)	16kHz dB(A)
Vac	Point				81.0	81.0	0	Vacutech - in car	62.4	69.2	75.8	72.6	71.3	73.2	72.6	67.8	59.2
Vac	Point				81.0	81.0	0	Vacutech - in car	62.4	69.2	75.8	72.6	71.3	73.2	72.6	67.8	59.2
Vac	Point				81.0	81.0	0	Vacutech - in car	62.4	69.2	75.8	72.6	71.3	73.2	72.6	67.8	59.2
Vac	Point				81.0	81.0	0	Vacutech - in car	62.4	69.2	75.8	72.6	71.3	73.2	72.6	67.8	59.2
Vac	Point				81.0	81.0	0	Vacutech - in car	62.4	69.2	75.8	72.6	71.3	73.2	72.6	67.8	59.2
Vac	Point				81.0	81.0	0	Vacutech - in car	62.4	69.2	75.8	72.6	71.3	73.2	72.6	67.8	59.2
Vac	Point				81.0	81.0	0	Vacutech - in car	62.4	69.2	75.8	72.6	71.3	73.2	72.6	67.8	59.2
Vac	Point				81.0	81.0	0	Vacutech - in car	62.4	69.2	75.8	72.6	71.3	73.2	72.6	67.8	59.2

QQ 22-0272 1590 Vineyard Rd, Roseville
Contribution spectra - 002 - 12 Sonny - Lined: Outdoor SP

Source	Time slice	Sum	25Hz	31.5Hz	40Hz	50Hz	63Hz	80Hz	100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
		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 Fl G Lr,lim dB(A) Leq,d 56.1 dB(A) Sigma(Leq,d) 0.0 dB(A)																									
001 - 12 Sonny - Standard Tunnel-Facade 01	Leq,d	-4.3								-13.0			-7.8			-9.7			-14.3			-19.6			-35.8
001 - 12 Sonny - Standard Tunnel-Facade 02	Leq,d	5.6								-6.0			0.3			2.4			-4.0			-8.6			-22.9
001 - 12 Sonny - Standard Tunnel-Facade 03	Leq,d	6.8								-4.0			1.2			3.3			-1.9			-5.1			-19.2
001 - 12 Sonny - Standard Tunnel-Facade 04	Leq,d	-9.9								-21.2			-12.6			-15.1			-21.3			-31.1			-49.5
001 - 12 Sonny - Standard Tunnel-Roof 01	Leq,d	6.7								-6.6			2.5			3.2			-3.6			-8.3			-23.3
001 - 12 Sonny - Standard Tunnel-Transmissive area 01	Leq,d	39.0								19.1			27.2			30.3			37.2			30.1			13.8
001 - 12 Sonny - Standard Tunnel-Transmissive area 01	Leq,d	55.7								34.3			40.4			48.6			51.6			51.3			39.7
001 - 12 Sonny - Standard Tunnel-Transmissive area 03	Leq,d	-7.9								-17.0			-11.5			-12.2			-20.7			-25.8			-40.0
001 - 12 Sonny - Standard Tunnel-Transmissive area 04	Leq,d	-9.3								-18.4			-12.9			-13.7			-22.0			-26.6			-40.8
001 - 12 Sonny - Standard Tunnel-Transmissive area 05	Leq,d	1.8								-10.6			-2.7			-1.6			-8.1			-12.9			-28.4
Turbine	Leq,d	13.4				-15.4	-8.6	-1.9	-2.0	0.3	0.9	-0.5	-1.7	-2.9	-5.6	-5.9	-4.5	-3.2	-2.6	1.9	3.2	2.7	0.0	3.7	3.6
Turbine	Leq,d	22.7				-7.4	-0.3	6.7	7.6	10.3	11.1	8.4	7.4	6.4	6.2	4.1	5.6	6.7	7.2	9.9	10.7	10.5	8.0	12.1	12.6
Vac	Leq,d	32.1	-4.8	-1.8	5.2	9.2	12.2	16.2	15.8	16.8	19.8	18.8	19.8	15.8	14.1	18.0	12.0	18.9	19.9	18.0	22.2	22.0	21.6	21.1	20.4
Vac	Leq,d	31.5	-5.3	-2.3	4.7	8.7	11.7	15.7	15.3	16.3	19.3	18.2	19.2	15.1	13.4	17.4	11.3	18.4	19.4	17.5	21.7	21.5	21.1	20.6	19.8
Vac	Leq,d	32.6	-4.3	-1.3	5.7	9.7	12.7	16.7	16.3	17.3	20.3	19.5	20.5	16.5	14.7	18.7	12.7	19.4	20.4	18.5	22.6	22.4	22.1	21.7	20.9
Vac	Leq,d	33.2	-3.8	-0.8	6.2	10.2	13.2	17.2	16.8	17.8	20.8	20.2	21.2	17.1	15.4	19.3	13.3	20.0	20.9	19.0	23.1	22.9	22.6	22.2	21.5
Vac	Leq,d	28.1	-3.3	-0.3	6.7	8.7	11.5	15.2	14.6	15.3	18.0	19.3	19.8	15.2	12.7	16.1	9.3	13.6	13.9	11.8	15.3	14.3	13.2	11.8	10.1
Vac	Leq,d	31.3	-5.7	-2.7	4.3	8.3	11.3	15.3	14.9	15.8	18.8	17.6	18.5	14.5	14.2	18.2	12.1	18.4	19.4	17.5	21.7	21.4	21.0	20.4	19.5
Vac	Leq,d	31.3	-6.9	-3.9	3.1	7.1	10.1	14.1	13.3	14.3	19.6	17.7	18.8	14.8	13.0	17.0	10.9	18.5	19.8	17.7	22.0	21.7	21.3	20.6	19.5
Vac	Leq,d	30.6	-6.7	-3.7	3.3	7.3	10.3	14.3	13.6	14.6	18.5	18.3	19.2	15.2	13.4	17.4	11.3	17.4	18.6	16.5	20.7	20.4	19.8	19.8	18.6
Vac	Leq,d	30.8	-6.4	-3.4	3.6	7.6	10.6	14.6	13.9	15.8	18.8	18.6	19.6	15.6	13.8	17.7	11.5	17.5	18.4	16.6	20.8	20.5	20.0	19.9	18.8
Vac	Leq,d	30.9	-6.2	-3.2	3.8	7.8	10.8	14.8	14.3	16.0	18.9	18.9	19.7	15.5	13.5	17.4	11.2	17.6	18.6	16.7	20.9	20.6	20.2	19.6	18.6
Vac	Leq,d	29.7	-7.9	-4.9	2.1	6.1	9.1	13.1	12.0	13.0	16.0	13.9	17.0	13.0	11.3	15.3	9.2	17.2	18.6	16.4	20.8	20.5	19.9	19.1	17.8
Vac	Leq,d	30.0	-7.6	-4.6	2.4	6.3	9.3	13.3	12.3	13.3	16.3	14.3	17.4	13.4	11.7	15.6	9.6	17.5	18.8	16.7	21.1	20.7	20.2	19.4	18.2
Vac	Leq,d	28.8	-7.4	-4.4	2.6	6.6	9.6	13.6	12.6	13.6	16.6	14.7	16.3	12.1	10.3	14.1	8.0	15.6	17.2	15.0	19.4	19.0	18.5	17.8	16.6
Vac	Leq,d	29.1	-7.2	-4.2	2.8	6.8	9.8	13.8	13.0	14.0	16.9	15.1	16.4	12.3	10.5	14.4	8.3	16.0	17.5	15.3	19.6	19.3	18.8	18.1	17.0
Vac	Leq,d	28.5	-5.9	-2.9	4.1	7.1	10.0	13.8	13.2	15.0	17.8	19.2	20.1	15.9	13.9	17.7	11.3	14.2	14.6	13.1	16.7	15.8	14.6	13.1	11.1
Vac	Leq,d	29.8	-6.9	-3.9	3.1	7.1	10.1	14.1	13.3	14.3	17.3	15.5	16.5	12.5	12.4	16.5	10.4	16.9	18.3	16.1	20.4	20.0	19.6	18.8	17.7
Vac	Leq,d	30.1	-6.6	-3.6	3.4	7.4	10.4	14.3	13.7	14.7	17.6	16.0	17.0	12.9	12.8	16.9	10.8	17.2	18.2	16.4	20.6	20.3	19.8	19.1	18.0
Vac	Leq,d	30.4	-6.3	-3.3	3.7	7.7	10.7	14.6	14.1	15.1	18.0	16.5	17.5	13.5	13.0	17.0	10.8	17.4	18.4	16.6	20.8	20.5	20.1	19.4	18.4
Vac	Leq,d	30.7	-6.1	-3.1	3.9	7.9	10.9	14.9	14.4	15.4	18.4	17.0	18.0	14.0	13.5	17.4	11.2	17.8	18.7	16.8	21.1	20.8	20.3	19.7	18.8
Vac	Leq,d	27.9	-7.9	-5.0	1.9	5.6	8.4	12.1	11.3	13.8	16.5	19.3	20.0	15.6	13.5	17.2	10.9	13.1	13.7	11.9	15.7	15.0	14.2	13.0	11.5
Vac	Leq,d	24.7	-8.1	-5.3	1.5	5.2	7.9	11.5	10.7	11.2	13.7	16.7	17.2	12.6	9.9	13.2	6.4	8.2	8.5	7.7	11.3	11.1	9.8	8.0	5.6
Vac	Leq,d	29.4	-6.7	-3.7	3.3	7.3	10.2	14.2	13.8	14.8	17.7	18.7	19.7	15.7	13.9	17.9	11.9	16.0	16.7	14.7	18.6	18.1	17.3	16.3	14.9
Vac	Leq,d	29.5	-6.4	-3.4	3.6	7.6	10.5	14.5	14.0	15.0	17.9	19.2	20.2	16.2	14.4	18.4	12.4	15.7	16.4	14.3	18.5	18.0	17.1	16.0	14.6

QQ 22-0272 1590 Vineyard Rd, Roseville
Contribution spectra - 002 - 12 Sonny - Lined: Outdoor SP

Source	Time slice	Sum	25Hz	31.5Hz	40Hz	50Hz	63Hz	80Hz	100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
		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 R2 Fl G Lr,lim dB(A) Leq,d 43.4 dB(A) Sigma(Leq,d) 0.0 dB(A)																									
001 - 12 Sonny - Standard Tunnel-Facade 01	Leq,d	-11.2								-20.4			-14.4			-16.1			-24.3			-29.2			-44.5
001 - 12 Sonny - Standard Tunnel-Facade 02	Leq,d	-7.3								-18.1			-12.0			-12.4			-14.0			-19.6			-36.5
001 - 12 Sonny - Standard Tunnel-Facade 03	Leq,d	-7.5								-16.7			-10.5			-12.4			-20.8			-25.8			-43.0
001 - 12 Sonny - Standard Tunnel-Facade 04	Leq,d	-21.0								-32.7			-22.9			-26.5			-41.4			-52.1			-70.6
001 - 12 Sonny - Standard Tunnel-Roof 01	Leq,d	-4.0								-14.2			-7.3			-8.7			-14.7			-21.5			-39.4
001 - 12 Sonny - Standard Tunnel-Transmissive area 01	Leq,d	23.6								6.2			17.2			20.5			16.8			10.7			-4.5
001 - 12 Sonny - Standard Tunnel-Transmissive area 01	Leq,d	43.1								15.4			21.3			25.8			40.3			39.4			25.7
001 - 12 Sonny - Standard Tunnel-Transmissive area 03	Leq,d	-14.0								-23.1			-17.6			-18.5			-26.1			-30.6			-45.8
001 - 12 Sonny - Standard Tunnel-Transmissive area 04	Leq,d	-14.7								-23.7			-18.3			-19.1			-26.5			-30.9			-46.2
001 - 12 Sonny - Standard Tunnel-Transmissive area 05	Leq,d	-6.4								-17.2			-10.4			-10.7			-16.1			-22.0			-39.7
Turbine	Leq,d	3.3				-20.2	-13.8	-7.5	-8.4	-6.3	-6.0	-9.1	-10.6	-12.0	-15.0	-17.5	-16.3	-15.9	-13.2	-10.7	-10.0	-10.3	-12.6	-8.2	-7.8
Turbine	Leq,d	13.5				-15.6	-9.0	-2.4	-2.7	-0.4	0.1	-5.3	-6.7	-3.5	-6.3	-6.1	-2.6	-0.6	-0.1	3.0	3.9	3.3	0.5	4.1	3.7
Vac	Leq,d	15.3	-14.8	-12.4	-6.2	-2.9	-0.8	2.3	0.1	0.2	2.3	5.2	5.3	2.7	0.5	3.5	-3.5	-1.3	2.9	1.8	5.5	4.3	2.7	0.5	-2.4
Vac	Leq,d	13.9	-15.2	-12.9	-6.7	-3.5	-1.4	1.7	-0.5	-0.5	1.6	4.7	4.7	-0.2	-0.1	2.9	-4.1	-1.8	1.7	-0.7	2.8	1.4	-0.4	-2.4	-4.9
Vac	Leq,d	18.1	-14.6	-12.2	-5.9	-2.6	-0.4	2.7	0.5	0.7	2.8	5.7	5.8	6.9	5.2	8.9	2.7	4.7	6.9	4.5	8.3	7.2	5.8	4.0	1.4
Vac	Leq,d	22.4	-13.2	-10.3	-3.4	0.5	3.4	7.4	6.0	6.9	9.8	12.5	13.5	9.5	7.8	11.7	5.7	9.4	10.2	7.6	11.6	10.7	9.5	8.0	5.9
Vac	Leq,d	23.2	-13.2	-10.3	-3.4	0.5	3.5	7.4	6.0	6.9	9.8	12.6	13.5	9.5	7.8	11.7	5.7	11.2	11.8	9.2	13.2	12.3	11.2	9.7	7.7
Vac	Leq,d	13.5	-15.4	-13.1	-6.9	-3.8	-1.7	1.3	-0.9	-0.9	1.2	4.2	4.3	-0.7	-0.5	2.5	-4.6	-2.2	1.4	-1.1	2.4	1.0	-0.7	-2.7	-5.1
Vac	Leq,d	13.1	-16.3	-14.0	-7.8	-4.6	-2.5	0.6	-1.9	-1.8	2.5	5.7	5.7	0.7	-2.2	0.8	-6.3	-5.1	-3.5	-2.6	0.8	-0.8	-2.7	-4.9	-7.7
Vac	Leq,d	13.9	-16.0	-13.7	-7.5	-4.3	-2.2	0.9	0.8	0.9	3.4	6.6	6.6	1.7	-1.3	1.7	-5.3	-4.2	-2.4	-3.0	0.5	-1.0	-2.7	-4.6	-7.0
Vac	Leq,d	16.1	-15.9	-13.5	-7.2	-4.0	-1.9	1.2	1.2	1.3	3.8	7.0	7.0	2.1	-0.9	2.1	-4.9	3.6	4.3	2.0	5.9	4.9	3.5	1.7	-0.8
Vac	Leq,d	16.5	-15.5	-13.1	-6.7	-3.5	-1.3	1.8	1.8	1.9	4.4	7.4	7.5	2.6	-0.4	2.6	-4.4	3.9	4.7	2.4	6.3	5.2	3.9	2.0	-0.5
Vac	Leq,d	10.7	-16.5	-14.2	-8.0	-4.8	-2.7	0.4	-2.1	-2.1	0.0	3.1	3.1	-1.8	-4.8	-1.8	-8.8	-7.7	-7.8	-7.4	-4.0	-5.6	-7.4	-9.2	-11.5
Vac	Leq,d	12.5	-16.4	-14.1	-7.9	-4.8	-2.7	0.4	-2.1	-2.0	2.3	5.4	5.5	0.5	-2.5	0.5	-6.5	-5.4	-5.5	-5.5	-2.1	-3.7	-5.5	-7.4	-9.7
Vac	Leq,d	12.5	-16.4	-14.1	-7.9	-4.7	-2.6	0.5	-2.0	-1.9	2.3	5.5	5.5	0.5	-2.5	0.5	-6.5	-5.4	-5.4	-5.3	-1.9	-3.5	-5.4	-7.2	-9.6
Vac	Leq,d	12.7	-16.3	-14.0	-7.8	-4.7	-2.6	0.5	-2.0	-1.9	2.4	5.5	5.5	0.6	-2.4	0.6	-6.4	-5.3	-5.0	-4.5	-1.1	-2.6	-4.4	-6.3	-8.8
Vac	Leq,d	18.1	-15.3	-12.8	-6.5	-3.2	-1.0	2.2	2.2	2.3	4.8	7.9	8.0	3.1	0.1	3.1	-3.9	5.9	6.5	5.4	9.3	8.2	6.8	4.9	2.2
Vac	Leq,d	11.7	-15.9	-13.6	-7.5	-4.4	-2.3	0.7	-1.6	-1.5	0.5	3.6	3.6	-1.4	-2.4	0.6	-6.5	-5.3	-3.9	-6.5	-2.5	-4.0	-5.5	-7.2	-9.2
Vac	Leq,d	12.0	-15.8	-13.6	-7.4	-4.3	-2.3	0.8	-1.5	-1.5	0.6	3.6	3.7	-1.3	-2.3	0.7	-4.5	-3.4	-2.4	-4.8	-1.2	-2.7	-4.2	-6.0	-7.9
Vac	Leq,d	14.3	-15.7	-13.5	-7.3	-4.3	-2.2	0.8	-1.5	-1.4	0.6	3.7	3.7	-1.3	-1.2	1.8	-3.8	-2.7	3.7	1.2	5.1	4.0	2.6	0.8	-1.7
Vac	Leq,d	14.5	-15.6	-13.4	-7.2	-4.1	-2.1	1.0	-1.3	-1.3	0.8	3.8	3.9	-1.1	-1.0	2.0	-3.6	-2.5	3.8	1.4	5.2	4.1	2.8	0.9	-1.6
Vac	Leq,d	17.1	-15.1	-12.6	-6.2	-2.9	-0.6	2.6	2.7	2.9	5.3	8.5	8.6	3.7	0.7	3.7	-3.2	3.2	3.4	3.1	6.8	5.6	4.0	1.9	-1.1
Vac	Leq,d	22.8	-14.0	-11.1	-4.2	-0.3	2.7	6.6	7.2	8.1	11.0	13.6	14.6	10.6	8.9	12.8	6.8	9.1	9.7	7.1	11.0	10.1	8.9	7.2	5.0
Vac	Leq,d	21.4	-14.0	-11.1	-4.2	-0.3	2.7	6.6	5.0	5.9	8.8	11.4	12.4	8.3	6.6	10.6	4.5	7.0	7.7	7.3	11.3	10.3	9.1	7.5	5.4
Vac	Leq,d	18.8	-14.6	-11.8	-5.1	-1.4	1.3	4.9	3.0	3.5	5.9	9.5	9.8	5.1	2.4	5.6	1.2	6.6	7.0	4.3	8.2	7.1	6.1	4.4	2.0

QQ 22-0272 1590 Vineyard Rd, Roseville
Contribution spectra - 002 - 12 Sonny - Lined: Outdoor SP

Source	Time slice	Sum	25Hz	31.5Hz	40Hz	50Hz	63Hz	80Hz	100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
		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 R3 Fl G Lr,lim dB(A) Leq,d 50.1 dB(A) Sigma(Leq,d) 0.0 dB(A)																									
001 - 12 Sonny - Standard Tunnel-Facade 01	Leq,d	-8.6								-16.8			-11.8			-13.6			-22.7			-27.7			-43.3
001 - 12 Sonny - Standard Tunnel-Facade 02	Leq,d	-3.2								-12.8			-8.8			-9.1			-9.1			-13.8			-29.7
001 - 12 Sonny - Standard Tunnel-Facade 03	Leq,d	3.9								-7.3			-2.5			1.1			-5.1			-9.6			-24.4
001 - 12 Sonny - Standard Tunnel-Facade 04	Leq,d	-12.5								-23.5			-15.0			-17.2			-29.1			-36.8			-55.3
001 - 12 Sonny - Standard Tunnel-Roof 01	Leq,d	1.8								-10.9			-2.3			-1.6			-9.5			-14.6			-29.8
001 - 12 Sonny - Standard Tunnel-Transmissive area 01	Leq,d	34.2								17.3			25.1			28.7			27.6			29.7			14.5
001 - 12 Sonny - Standard Tunnel-Transmissive area 01	Leq,d	49.6								24.4			29.1			33.7			46.2			46.4			33.6
001 - 12 Sonny - Standard Tunnel-Transmissive area 03	Leq,d	-13.0								-21.5			-17.2			-17.2			-24.6			-29.4			-44.2
001 - 12 Sonny - Standard Tunnel-Transmissive area 04	Leq,d	-14.0								-22.3			-17.8			-18.5			-26.0			-30.8			-45.7
001 - 12 Sonny - Standard Tunnel-Transmissive area 05	Leq,d	-4.9								-16.1			-9.3			-9.0			-13.8			-19.4			-35.7
Turbine	Leq,d	9.7				-17.1	-10.3	-3.6	-4.3	-1.8	-1.3	-6.7	-4.2	-5.4	-8.1	-8.5	-5.6	-5.0	-4.5	-1.7	-0.9	-1.4	-4.3	-0.7	-1.2
Turbine	Leq,d	8.9				-16.0	-9.7	-3.4	-3.6	-1.5	-1.2	-6.6	-8.2	-9.6	-8.1	-9.8	-8.5	-6.9	-6.5	-3.9	-3.0	-3.5	-6.4	-2.5	-1.9
Vac	Leq,d	27.3	-8.2	-5.2	1.8	5.8	8.8	12.8	11.7	12.6	15.6	13.5	14.4	10.4	8.7	12.7	6.8	14.6	15.5	13.4	17.8	17.5	17.0	16.2	15.0
Vac	Leq,d	27.1	-8.4	-5.4	1.6	5.6	8.6	12.6	11.4	12.4	15.4	13.2	14.2	10.1	8.8	12.7	6.7	14.4	15.3	13.2	17.6	17.2	16.7	15.9	14.7
Vac	Leq,d	27.5	-8.0	-5.0	2.0	6.0	9.0	13.0	11.9	12.9	15.8	13.7	14.7	10.7	8.9	12.9	7.1	14.9	15.8	13.6	18.0	17.7	17.2	16.4	15.3
Vac	Leq,d	23.2	-9.6	-6.8	0.1	3.9	6.7	10.5	9.2	10.0	12.7	13.1	13.6	9.1	6.7	10.2	3.6	9.8	10.4	7.9	11.9	11.2	10.2	9.0	7.3
Vac	Leq,d	21.7	-9.5	-6.7	0.1	3.9	6.7	10.4	9.1	9.7	12.3	12.7	13.0	8.3	5.6	8.7	1.8	7.5	7.7	4.9	8.5	7.4	6.1	4.6	2.6
Vac	Leq,d	26.8	-8.5	-5.5	1.5	5.5	8.5	12.4	11.2	12.2	15.2	12.9	13.9	9.9	8.6	12.5	6.6	14.2	15.1	13.0	17.3	17.0	16.5	15.6	14.4
Vac	Leq,d	27.6	-9.5	-6.5	0.5	4.5	7.5	11.5	10.0	13.3	16.3	13.9	14.9	10.8	9.1	13.1	7.0	15.3	16.2	14.0	18.4	18.0	17.4	16.5	15.0
Vac	Leq,d	26.1	-9.3	-6.3	0.7	4.7	7.7	11.7	10.2	11.7	14.6	13.4	14.2	10.0	8.0	11.9	5.7	13.3	14.2	12.0	16.4	16.0	15.4	14.5	13.0
Vac	Leq,d	26.2	-9.2	-6.2	0.8	4.8	7.8	11.8	10.4	11.9	14.8	13.6	14.4	10.1	8.2	12.0	5.8	13.4	14.3	12.1	16.5	16.1	15.6	14.7	13.3
Vac	Leq,d	23.3	-10.7	-7.9	-1.0	2.8	5.6	9.5	7.9	9.6	12.3	13.5	13.9	9.3	6.8	10.5	3.9	9.6	10.3	8.0	12.2	11.7	11.0	10.0	8.5
Vac	Leq,d	26.4	-10.1	-7.1	-0.1	3.9	6.9	10.9	9.2	10.2	13.2	10.7	13.8	9.8	8.1	12.0	6.0	14.4	15.3	13.1	17.5	17.1	16.4	15.4	13.7
Vac	Leq,d	26.7	-9.9	-6.9	0.0	4.0	7.0	11.0	9.4	10.4	13.4	13.1	14.0	10.0	8.3	12.3	6.2	14.6	15.5	13.3	17.7	17.3	16.6	15.6	14.0
Vac	Leq,d	26.9	-9.8	-6.8	0.2	4.2	7.2	11.2	9.6	10.6	13.6	13.3	14.2	10.2	8.5	12.5	6.4	14.8	15.7	13.5	17.9	17.5	16.9	15.8	14.3
Vac	Leq,d	25.5	-9.6	-6.6	0.4	4.4	7.4	11.3	9.8	10.8	13.8	12.5	13.2	9.0	7.1	10.9	5.0	12.9	13.8	11.6	16.0	15.6	14.9	14.0	12.5
Vac	Leq,d	23.2	-10.6	-7.7	-0.9	2.9	5.7	9.5	8.0	9.6	12.2	13.4	13.7	9.0	6.4	9.9	3.1	8.5	11.1	8.7	12.8	12.1	11.0	9.6	7.5
Vac	Leq,d	27.1	-9.2	-6.3	0.7	4.7	7.7	11.7	10.3	11.3	14.3	11.9	12.8	8.8	8.9	12.9	6.9	15.1	16.0	13.8	18.2	17.8	17.2	16.2	14.7
Vac	Leq,d	26.4	-9.1	-6.1	0.9	4.9	7.9	11.9	10.5	11.5	14.5	12.1	13.1	9.1	8.1	12.2	6.1	13.6	14.5	12.9	17.2	16.8	16.2	15.2	13.8
Vac	Leq,d	26.4	-8.9	-5.9	1.1	5.1	8.1	12.1	10.8	11.7	14.7	12.4	13.4	9.3	8.3	12.4	6.2	13.8	14.7	12.5	16.9	16.5	16.0	15.1	13.8
Vac	Leq,d	26.6	-8.7	-5.7	1.3	5.3	8.3	12.3	11.0	12.0	14.9	12.7	13.6	9.6	8.4	12.4	6.2	14.0	14.8	12.7	17.1	16.7	16.2	15.4	14.1
Vac	Leq,d	20.9	-10.4	-7.6	-0.8	2.9	5.7	9.4	7.8	9.0	11.5	12.3	12.5	7.7	5.0	8.1	1.1	6.4	6.7	3.8	7.5	6.3	5.0	3.3	1.1
Vac	Leq,d	16.2	-11.1	-8.6	-2.2	1.1	3.3	6.5	4.4	4.5	6.6	7.2	7.3	2.4	-0.5	4.6	-2.4	0.4	0.4	-2.8	0.7	-0.4	-2.0	-3.9	-6.1
Vac	Leq,d	15.3	-11.5	-9.2	-2.9	0.2	2.3	5.4	3.3	3.3	5.4	6.8	6.8	1.9	-1.0	2.0	-3.3	-1.1	-1.1	-3.2	0.2	-1.0	-2.7	-4.7	-7.0
Vac	Leq,d	21.4	-10.2	-7.5	-0.9	2.7	5.3	8.8	7.0	7.3	9.5	9.9	9.8	4.7	1.7	4.6	-2.5	9.2	9.9	7.6	11.9	11.3	10.4	9.1	7.1

QQ 22-0272 1590 Vineyard Rd, Roseville
Contribution spectra - 002 - 12 Sonny - Lined: Outdoor SP

Source	Time slice	Sum	25Hz	31.5Hz	40Hz	50Hz	63Hz	80Hz	100Hz	125Hz	160Hz	200Hz	250Hz	315Hz	400Hz	500Hz	630Hz	800Hz	1kHz	1.25kHz	1.6kHz	2kHz	2.5kHz	3.15kHz	4kHz
		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 R4 Fl G Lr,lim dB(A) Leq,d 55.5 dB(A) Sigma(Leq,d) 0.0 dB(A)																									
001 - 12 Sonny - Standard Tunnel-Facade 01	Leq,d	15.9								4.4			9.8			12.8			7.2			3.0			-10.4
001 - 12 Sonny - Standard Tunnel-Facade 02	Leq,d	6.1								-4.8			0.2			2.9			-2.7			-6.7			-20.1
001 - 12 Sonny - Standard Tunnel-Facade 03	Leq,d	-0.6								-8.7			-3.4			-6.5			-13.7			-19.5			-34.8
001 - 12 Sonny - Standard Tunnel-Facade 04	Leq,d	-5.0								-16.7			-7.5			-9.4			-23.0			-35.6			-53.7
001 - 12 Sonny - Standard Tunnel-Roof 01	Leq,d	10.6								-2.9			6.4			7.3			-0.1			-4.5			-18.3
001 - 12 Sonny - Standard Tunnel-Transmissive area 01	Leq,d	39.8								24.3			33.1			37.0			33.1			24.4			9.0
001 - 12 Sonny - Standard Tunnel-Transmissive area 01	Leq,d	55.3								33.3			37.6			46.0			51.1			51.8			41.3
001 - 12 Sonny - Standard Tunnel-Transmissive area 03	Leq,d	-5.0								-12.5			-8.2			-10.4			-19.6			-24.6			-38.4
001 - 12 Sonny - Standard Tunnel-Transmissive area 04	Leq,d	12.1								0.4			5.1			9.1			4.2			0.4			-12.7
001 - 12 Sonny - Standard Tunnel-Transmissive area 05	Leq,d	5.7								-7.3			0.9			2.5			-4.1			-8.1			-21.8
Turbine	Leq,d	15.0				-12.0	-5.2	1.4	1.6	4.0	4.5	-0.7	-2.1	-3.3	-6.2	-4.2	-2.7	-1.3	-0.8	2.9	3.8	3.4	0.8	4.8	5.0
Turbine	Leq,d	20.6				-10.4	-3.3	3.7	4.1	6.9	10.7	5.7	5.0	4.2	1.8	-0.2	1.6	4.0	5.4	8.4	9.7	9.5	7.0	11.0	11.1
Vac	Leq,d	19.0	-9.9	-7.2	-0.7	2.8	5.3	8.6	6.8	6.9	8.9	11.0	10.7	5.3	2.0	7.7	0.5	1.9	3.1	0.1	4.4	2.9	1.1	-0.9	-3.4
Vac	Leq,d	18.7	-10.2	-7.6	-1.1	2.4	4.8	8.2	6.3	6.4	8.4	10.8	10.5	5.1	1.8	7.6	0.5	1.6	2.9	-0.1	4.2	2.7	0.9	-1.1	-3.5
Vac	Leq,d	20.1	-9.3	-6.6	0.0	3.6	6.1	9.5	7.8	8.0	10.0	11.4	11.1	5.8	2.6	8.0	0.8	2.7	3.7	0.6	8.2	7.1	5.6	3.6	0.7
Vac	Leq,d	22.4	-8.8	-6.0	0.8	4.6	7.3	11.0	9.6	10.2	12.9	13.6	13.9	9.1	6.4	9.5	2.4	7.6	7.5	4.3	9.8	8.6	7.2	5.4	2.9
Vac	Leq,d	30.2	-5.4	-2.4	4.6	8.6	11.6	15.6	14.5	15.5	18.5	16.4	17.4	13.3	11.6	15.6	9.5	17.4	18.4	16.2	20.7	20.4	19.9	19.2	18.0
Vac	Leq,d	20.5	-10.4	-7.8	-1.3	2.2	4.6	8.0	6.1	6.2	8.1	10.7	10.4	5.0	1.7	7.6	0.4	1.5	2.9	7.1	11.4	10.6	9.3	7.5	4.8
Vac	Leq,d	19.8	-10.7	-8.3	-1.9	1.5	3.8	7.0	5.3	5.3	7.2	9.8	9.5	4.0	0.6	3.1	-4.3	0.8	2.4	6.9	11.3	10.5	9.3	7.4	4.7
Vac	Leq,d	19.0	-11.5	-9.1	-2.8	0.4	2.6	5.7	3.8	3.6	5.3	7.6	7.2	1.7	-1.7	0.9	-6.3	2.2	2.2	6.8	11.2	10.3	9.1	7.3	4.6
Vac	Leq,d	19.7	-11.4	-9.1	-2.8	0.5	2.6	5.7	3.9	3.7	5.4	7.7	7.2	1.8	-1.6	1.0	-6.3	2.2	2.2	8.0	12.3	11.5	10.3	8.4	5.6
Vac	Leq,d	17.6	-11.3	-8.9	-2.6	0.6	2.8	5.8	4.0	3.9	5.6	7.8	7.3	1.9	-1.5	1.1	-6.2	2.2	2.2	3.8	8.3	7.3	6.0	4.1	1.4
Vac	Leq,d	22.3	-9.0	-6.3	0.4	4.0	6.7	10.2	8.8	9.2	11.6	12.1	12.1	7.1	4.2	7.1	0.1	6.2	6.3	8.4	12.5	11.7	10.6	8.9	6.5
Vac	Leq,d	18.5	-9.8	-7.2	-0.7	2.7	5.1	8.3	6.6	6.7	8.7	10.2	9.9	4.5	1.2	3.9	-3.4	2.3	3.5	0.4	4.8	3.5	2.0	0.1	-2.2
Vac	Leq,d	17.7	-10.3	-7.9	-1.4	1.9	4.2	7.4	5.6	5.6	7.5	9.8	9.4	4.0	0.5	3.1	-4.3	0.9	2.5	-0.6	4.0	2.8	1.2	-0.7	-3.0
Vac	Leq,d	17.6	-10.7	-8.2	-1.8	1.6	3.9	7.1	5.3	5.3	7.2	9.8	9.4	4.0	0.5	3.1	-4.4	0.8	2.4	-0.7	4.0	2.7	1.2	-0.7	-3.0
Vac	Leq,d	19.5	-11.0	-8.6	-2.3	0.9	3.1	6.1	4.3	4.2	6.0	7.9	7.5	2.0	-1.4	1.2	-6.1	2.3	2.3	3.8	12.1	11.3	10.0	8.2	5.3
Vac	Leq,d	21.1	-10.3	-7.6	-1.0	2.5	5.0	8.4	6.6	6.8	8.9	11.7	11.5	6.2	2.8	5.4	0.9	1.9	3.1	7.6	11.8	11.0	9.9	8.1	5.5
Vac	Leq,d	19.1	-10.4	-7.7	-1.1	2.4	4.9	8.3	6.6	6.8	8.9	11.7	11.5	6.2	2.9	5.5	0.9	1.9	3.1	0.1	4.4	2.9	1.1	-1.2	-3.7
Vac	Leq,d	18.4	-10.6	-8.0	-1.4	2.1	4.5	7.8	6.0	6.0	8.0	10.6	10.3	4.9	1.6	6.4	0.4	1.5	2.8	-0.1	4.2	2.7	0.9	-1.2	-3.6
Vac	Leq,d	20.5	-10.6	-8.0	-1.4	2.1	4.5	7.9	6.0	6.1	8.0	10.6	10.3	5.0	1.7	7.6	0.4	1.5	2.8	7.2	11.5	10.7	9.5	7.7	5.0
Vac	Leq,d	19.1	-10.3	-7.9	-1.5	1.8	4.0	7.1	5.4	5.3	7.2	8.4	8.0	2.5	-0.8	1.8	-5.5	2.6	2.6	-0.4	10.8	10.0	8.7	6.8	4.0
Vac	Leq,d	21.7	-8.9	-6.2	0.5	4.1	6.8	10.4	9.3	9.9	12.5	12.2	12.5	7.7	5.0	8.0	0.9	6.4	6.1	2.9	9.7	8.7	7.4	5.7	3.3
Vac	Leq,d	31.6	-4.4	-1.4	5.5	9.5	12.5	16.5	15.7	16.7	19.7	17.9	18.9	14.9	13.2	17.1	11.1	18.7	19.6	17.5	21.8	21.7	21.3	20.6	19.6
Vac	Leq,d	32.3	-4.5	-1.5	5.5	9.5	12.5	16.5	15.7	16.7	19.7	17.9	18.8	14.8	13.1	17.1	11.0	18.7	19.6	17.5	23.5	23.2	22.8	22.1	21.0

Appendix C:

Equipment Reference Data

SOUND LEVEL METER READINGS

MODEL: FT-DD-T340HP4 (40hp VACSTAR TURBINE VACUUM PRODUCER)

READING ONE: 43 DB-A, 3 FEET FROM TURBINE @ 45° ANGLE
AND NO BACKGROUND NOISE OR OUTSIDE INTERFERENCE.

READING TWO: 36 DB-A, 10 FEET FROM TURBINE @ 45° ANGLE
AND NO BACKGROUND NOISE OR OUTSIDE INTERFERENCE.

READING THREE: 24 DB-A, 20 FEET FROM TURBINE @ 45° ANGLE
AND NO BACKGROUND NOISE OR OUTSIDE INTERFERENCE.

READING FOUR: 12 DB-A, 30 FEET FROM TURBINE @ 45° ANGLE
AND NO BACKGROUND NOISE OR OUTSIDE INTERFERENCE.

NOTE: THESE READINGS WERE TAKEN OUTSIDE OF 8'x10'x8' CINDER BLOCK ENCLOSURE WITH CONCRETE SLAB AND WOOD JOIST ROOF.

SOUND LEVEL METER USED:

SIMPSON MODEL #40003 – MSHA APPROVED.
MEETS OSHA & WALSH-HEALY REQUIREMENTS FOR NOISE CONTROL.
CONFORMS TO ANSI S1.4-1983, IEC 651 SPECS FOR METER TYPE.

Vacutech
1350 Hi-Tech Drive, Sheridan WY, 82801
PHONE: (800) 917-9444 FAX: (303) 675-1988
EMAIL: info@vacutechllc
WEB SITE: vacutechllc.com

MD ACOUSTICS
Sound Solutions for Planning and Design
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Chandler, AZ 85249
p. (602) 774-1950

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

Project: SuperStar Car Wash Chula Vista
Site Location: 1555 W Warner Rd, Gilbert, AZ 85233
Date: 4/5/2018
Field Tech/Engineer: Robert Pearson
Source/System: Vacutec System

Location: Vac Bay 1
Sound Meter: NTi XL2 **SN:** A2A-05967-E0
Settings: A-weighted, slow, 1-sec, 10-sec duration
Meteorological Cond.: 80 degrees F, 2 mph wind

Site Observations:
Clear sky, measurements were performed within 1.5ft of source. Measurements were performed while the vacuum was positiioned at three (3) different positions. Holstered, unholstered and inside a car. This data is utilized for acoustic modeling purposes and represents an average sound level at a vacuum station.

Table 1: Summary Measurement Data

Source	System	Overall dB(A)	3rd Octave Band Data (dBA)																														
			20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1K	1.25K	1.6K	2K	2.5K	3.15K	4K	5K	6.3K	8K	10K	12.5K	16K	20K
Vacutech (Holstered)	Vacuum	63.3	9	17	22	29	31	35	40	41	44	43	46	48	47	49	51	51	51	52	53	52	52	50	52	53	50	47	47	48	45	39	30
Vacutech (Unholstered)	Vacuum	80.7	6	19	22	28	34	37	40	43	47	46	48	48	48	49	54	55	58	58	62	65	68	70	74	75	73	69	67	65	63	60	55
Vacutech (Inside Car)	Vacuum	69.6	16	28	31	38	42	45	49	51	52	55	60	61	57	55	59	53	55	56	54	57	57	57	57	57	55	54	51	48	46	42	36
Average Level*	Vacuum	76.3	13	24	28	34	38	41	45	47	49	51	56	57	53	52	56	54	56	56	59	61	64	66	69	70	68	64	62	60	58	55	50

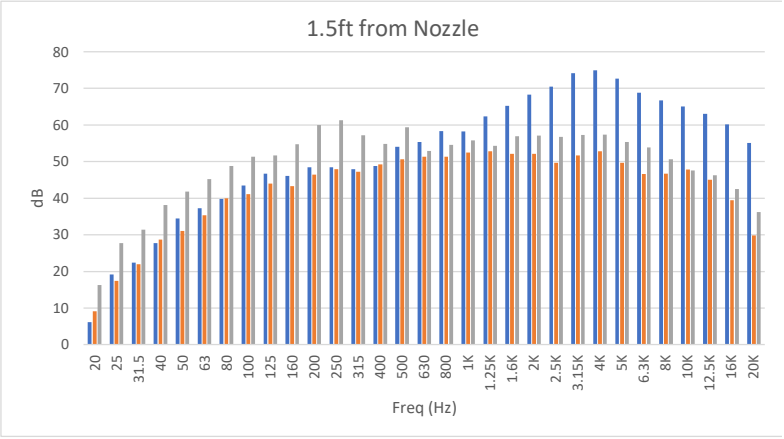
* Refers to the logarithmic average of all measurements. This measurement represents an average of the multiple vacuum positions.

Figure 1: Example Measurement Position

Figure 1: Holstered

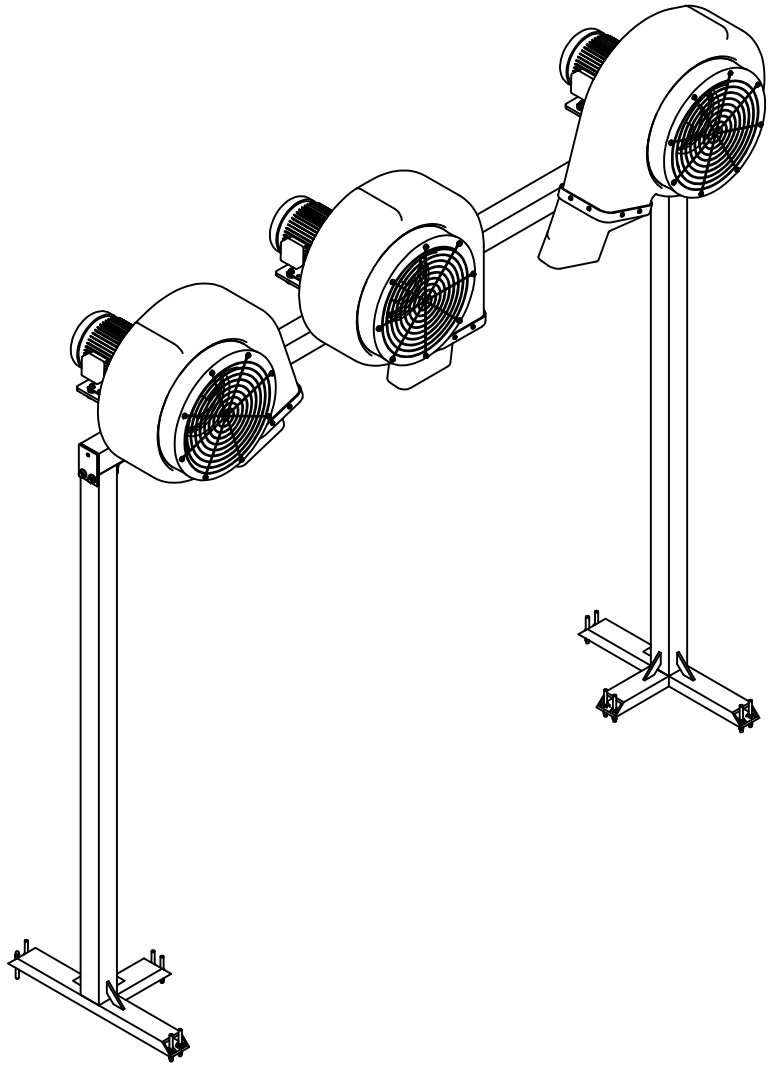
Figure 2: Unholstered

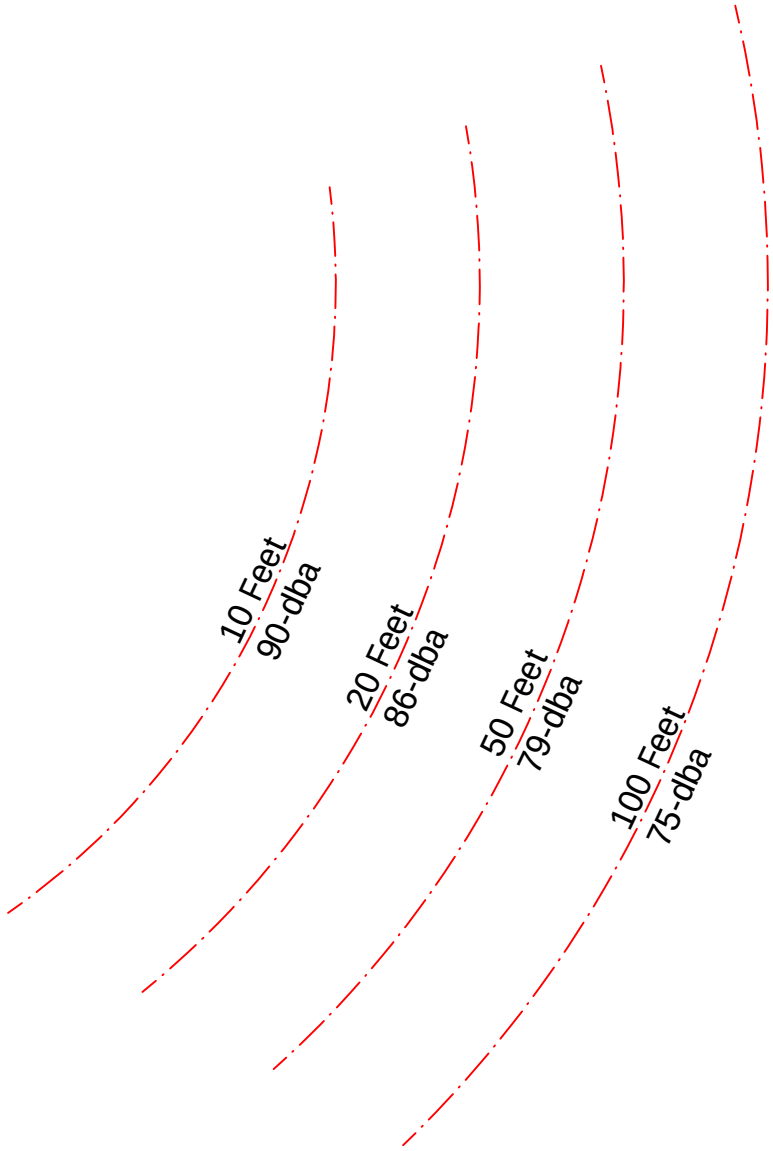
Figure 3: Inside Car



Vacutech sound levels

Enviromental Noise with Dryer OFF: 70 dba





THIRD ANGLE PROJECTION	*MACHINING TOLERANCES*	DRAWN LVerdecia	8/26/2011
BREAK ALL SHARP CORNERS. PART TO BE FREE OF BURRS.	FRACTION± 1/16"	APPROVED	8/1/2012
UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN INCHES	.XX DECIMAL ± 0.030	CATEGORY BLOWER	
MATERIAL	.XXX DECIMAL ± 0.005		
	ANGULARITY ± 2°		
	FINISH 125		

SONNY'S ENTERPRISES
THE CARWASH FACTORY

DESCRIPTION	BLOWER ASSEMBLY, ONE ARCH 45HP		
PART NUMBER	BL1-45HP-1		
SHEET 2 OF 2	SIZE A	SCALE N.T.S.	

Product Features

- Gain flexibility in complying with noise ordinances that limit the allowable noise levels in some zoned areas.
- Blower Inlet Silencer retrofits to an existing Sonny's blower to reduce noise level by up to 7 decibels at 50 feet (depending on site specific architecture and other variables).
- Available in three colors: **Blue (# 20018006), Black (# 20018005)** and **Red (# 20018008)**

Note: Hardware is not included. Order a self-tapping screw kit (# **10013134**) for each silencer.

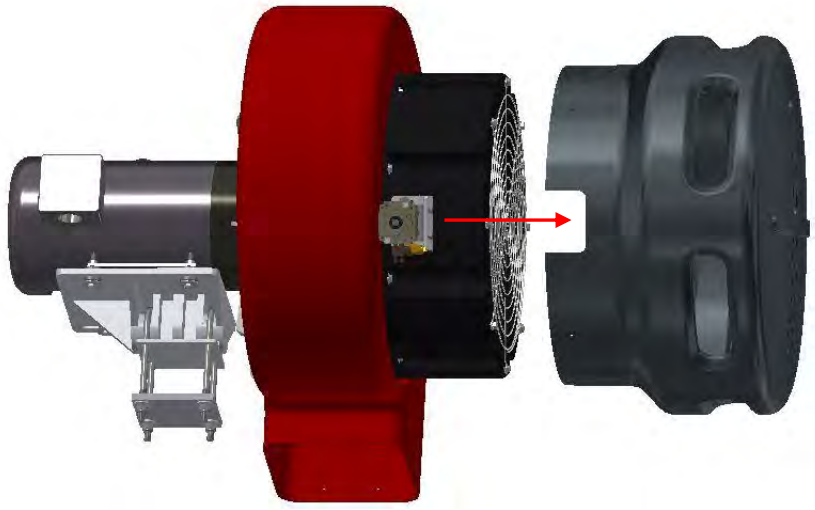
INSTALLATION

Tools
1. Safety Glasses
2. Cordless Drill
3. Drive Socket Set
4. 8' Ladder

Consumables
None

Work Force
Two (2) persons

Time (assuming no problems)
15 - 30 minutes



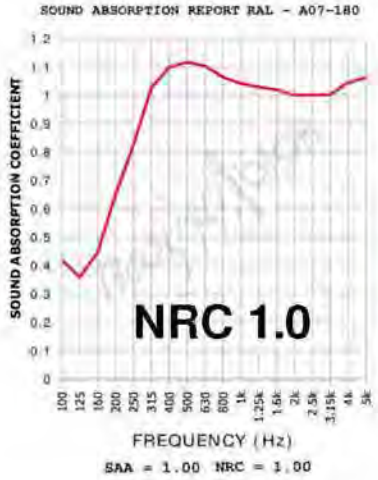
Caution: You must shut off all power to the conveyor and lock out the Motor Control Center before starting this install.

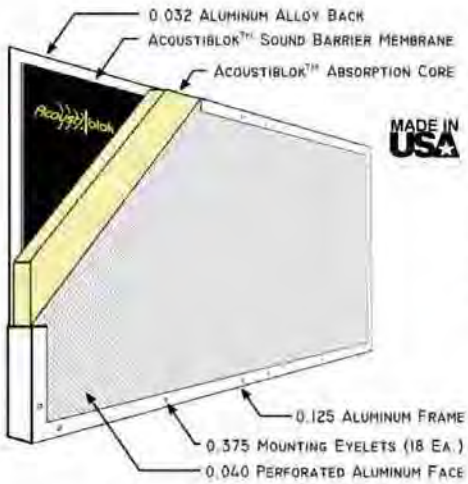
1. Shut off all power to the conveyor, blowers and lock out the Motor Control Center.
2. Insert the silencer over the venturi. For the gator silencer option, align notches to the gator actuator bracket (as pictured above).
3. Using the existing holes on the Silencer housing, affix the silencer to the gator housing using (8) of the provided self-tapping screws **(# 10013134**).
4. Avoid over-torqueing the self-tapping screws to prevent stripping the plastic housing.

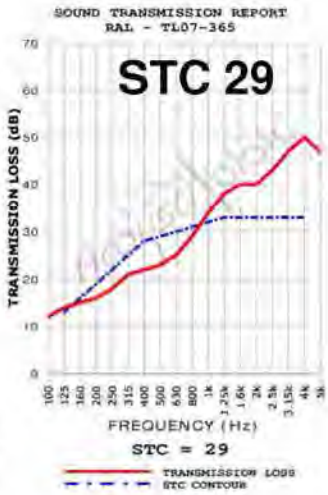
Appendix I

North American Office
Acoustiblok, Inc.
6900 Interbay Boulevard
Tampa, FL 33616 USA
Phone: 813-980-1400
Fax: 813-549-2653
www.acoustiblok.com
sales@acoustiblok.com

Industrial Model All Weather Sound Panel™ (Pat. Pend)
Technical Data







Acoustiblok All Weather Sound Panels™ achieve high STC and NRC ratings. They have been specifically designed to withstand outdoor exposure in full sunlight, extreme weather conditions, and harsh industrial environments. (NRC of 1.0 is the highest sound absorption rating possible)

All Weather Sound Panels include an internal layer of U.L. classified Acoustiblok sound isolation material plus a specifically engineered 2" thick weather proof sound absorbing material.

Specifications:		
NRC (Noise Reduction Coefficient):	1.00 *	Gross dimensions: up to 48" x 120"x 2.423", ± 0.125" custom sizes available on special order.
STC (Sound Transmission Class):	29 *	Frame construction: 0.125" welded corrosion resistant 6063-T5 aluminum, mill finish, eyelets: 0.375" (18 ea.)
Weight: (8' panel)	104 lbs	Front face: 0.040 corrosion resistant 5052-H32 aluminum alloy, 3/32" round holes staggered on 5/32" centers.
UL Std 723 fire resistance: Flame spread 0, smoke developed 0.		Back face: 0.032 corrosion resistant 5052-H32 aluminum alloy, mill finish.
UV tolerant, animal resistant, washable, does not support mold growth.		

* Independent Testing by accredited NVLAP testing facility in compliance with ASTM E90, E 413, and other applicable industry standards.

Subject to change without notice, contact Acoustiblok for details.

Acoustiblok® quieting the world

Product Data Sheet

Product Name

QuietFiber® Hydrophobic Noise Absorption Material – QF2

For Manufacturer Info:

Contact:
Acoustiblok, Inc.
6900 Interbay Boulevard
Tampa, FL 33616
Call - (813) 980-1400
Fax - (813)849-6347
Email - sales@acoustiblok.com
www.acoustiblok.com

Product Description

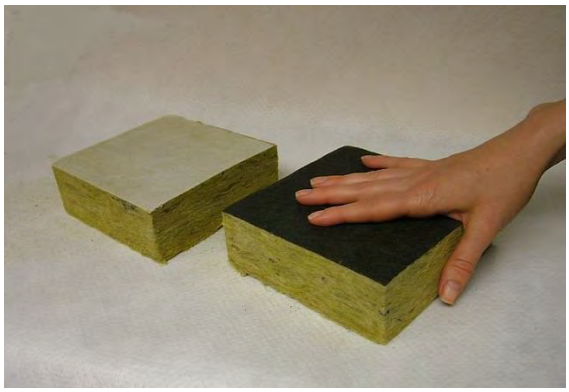
Basic Use

QuietFiber hydrophobic noise absorption material is an easily installed solution to many noise problems. It is engineered specifically for maximum noise absorption and is used extensively for industrial and commercial applications and is now being successfully introduced into non-industrial environments where reverberant sound and echo is a problem.

QuietFiber® QF2

QuietFiber is rated at the highest noise reduction level – NRC 1.00. Areas of high noise levels including sound reverberation can be resolved easily and economically by introducing QuietFiber into as much of the area as possible. The amount of noise reduction in highly reflective rooms will be directly relative to how much of the QuietFiber material can be installed into the room.

Unlike other fibrous materials which do not have the same high NRC ratings, QuietFiber is hydrophobic, meaning it will not absorb nor combine with water. Marine noise reduction applications are endless.



QuietFiber® QF2

- Highest noise absorption rating of NRC 1.00
- Non Silica
- Virtually fireproof – Class A fire rating
  - 0 Smoke + 0 Flame Development
- Hydrophobic – will not combine with water
- Will not support mold or mildew growth
- Available in plain, black or white face
- Full outdoor weather and U.V. tolerant
- Significant sound benefit v. fiberglass
- Install on top of acoustical ceiling tiles
- High temperature capable
- Comprised of up to 90% recycled material
- 100% recyclable

Product Data Sheet

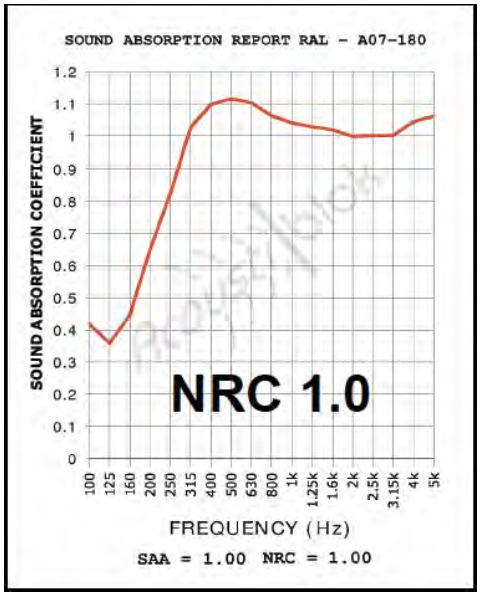
Product Name

QuietFiber® Hydrophobic Noise Absorption Material – QF2

NRC 1.0 Rated	125hz	250hz	500hz	1000hz	2000hz	4000hz
	0.36	0.79	1.15	1.04	1.01	1.04

Technical Data:

- ASTM C 423 – NRC 1.00
- ASTM E 84 – Class 1, 0 Flame 0 Smoke
- ASTM C 518 – R 4.2 per inch
- ASTM C 518 – 0.24 @ 75°F (24°C)



Standards Compliance:

- ASTM C 665 Non-Corrosive Type I
- ASTM C 612 1A, 1B, II, III
- ASTM E 136 Rated Non-combustible per NFPA Standard 220
- ASTM C 1104 Absorption less than 1% by volume
- ASTM C 356 Linear shrinkage <2% @ 1200°F (650°C)

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Tampa, Florida USA 33616
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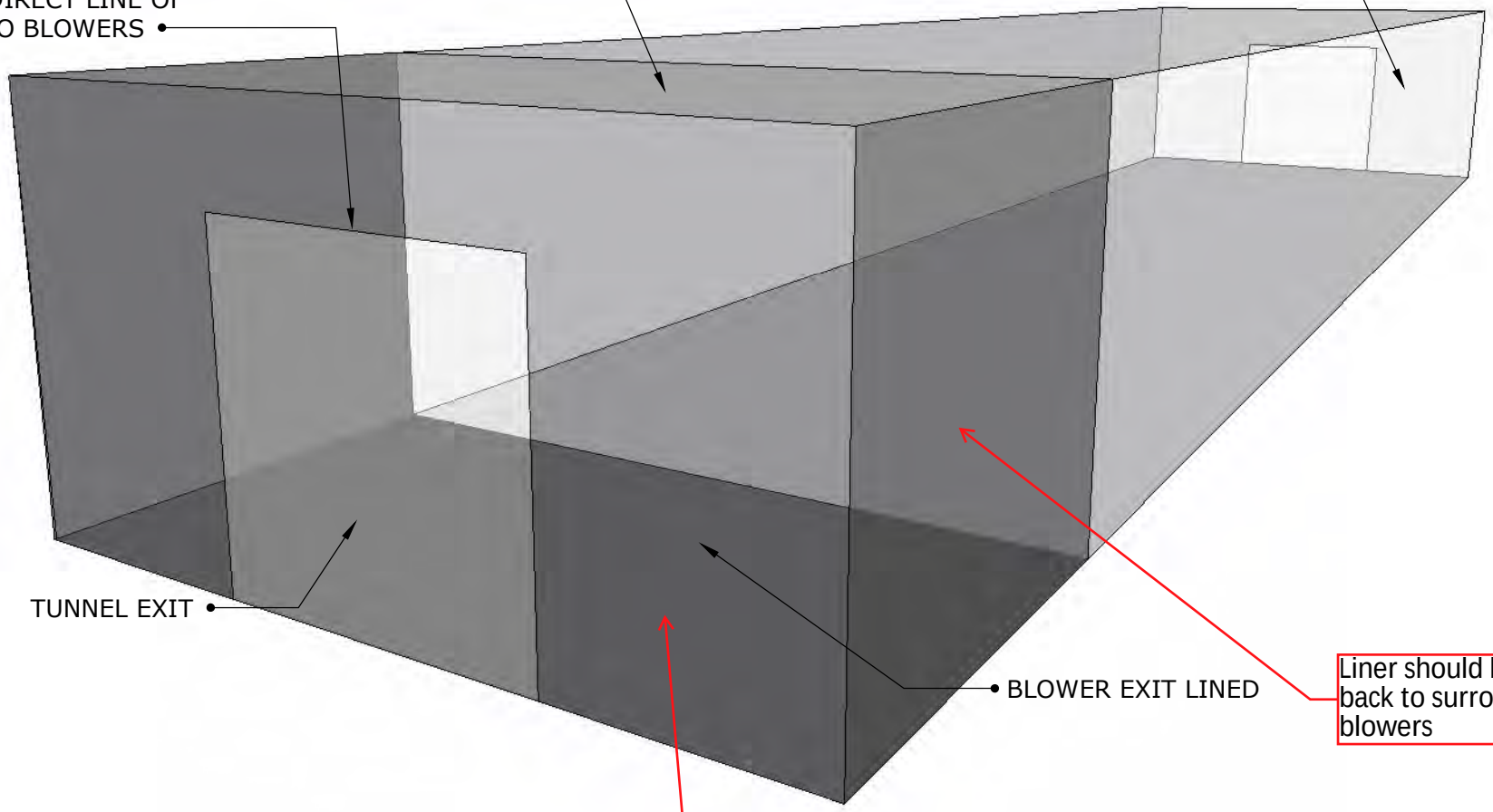
LINE EXIT INTERIOR SECTION
OF BLOWER ROOM W/ 2" THICK ACOUSTIC
MATERIAL W/ NRC 1.0 OR EQUIVALENT.
LINER NEEDS TO BE ADDED
TO ALL SURFACES EXCEPT FLOOR

TUNNEL ENTRANCE

TUNNEL EXIT MUST
BLOCK DIRECT LINE OF
SIGHT TO BLOWERS



TUNNEL EXIT

BLOWER EXIT LINED

Liner should be set back to surround blowers

Exit wall does not need to be lined

MD ACOUSTICS
Sound Solutions for Planning and Design

ACOUSTIC TREATMENTS TO TUNNEL INTERIOR

FOR ILLUSTRATIVE PURPOSES ONLY