9th Street and Vineyard Avenue Warehouse

NOISE IMPACT ANALYSIS

CITY OF RANCHO CUCAMONGA

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
ANSI	American National Standards Institute
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dBA	A-weighted decibels
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
Hz	Hertz
INCE	Institute of Noise Control Engineering
L_{eq}	Equivalent continuous (average) sound level
L_{max}	Maximum level measured over the time interval
L_{min}	Minimum level measured over the time interval
mph	Miles per hour
OPR	Office of Planning and Research
PPV	Peak particle velocity
Project	9th Street and Vineyard Avenue Warehouse
RMS	Root-mean-square
VdB	Vibration Decibels

EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine the potential noise impacts and the necessary noise mitigation measures, if any, for the proposed 9th Street and Vineyard Avenue Warehouse development ("Project"). The Project site is located west of Vineyard Avenue and north of 9th Street, in the City of Rancho Cucamonga. The project proposes 235,480 square feet of warehousing uses. This study has been prepared to satisfy applicable City of Rancho Cucamonga standards and thresholds of significance based on guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1)

OPERATIONAL NOISE ANALYSIS

Using reference noise levels to represent the expected noise sources from the 9th Street and Vineyard Avenue Warehouse site, this analysis estimates the Project-related stationary-source noise levels at nearby sensitive receiver locations. The typical activities associated with the proposed 9th Street and Vineyard Avenue Warehouse are anticipated to include idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, roof-top air conditioning units, and parking lot vehicle movements. The operational noise analysis shows that the Project-related stationary-source noise levels will exceed the City of Rancho Cucamonga exterior noise level standards at receiver location R1, north of the Project site, and represent a *potentially significant* noise impact at this location. All other receiver locations will experience unmitigated *less than significant* operational noise impacts.

Therefore, operational noise mitigation in the form of a minimum 8-foot high noise barrier at the northern Project site boundary is required, as shown on Exhibit ES-A. With the operational noise barrier mitigation, outlined below, the mitigated Project operational noise levels are shown to satisfy the City of Rancho Cucamonga daytime and nighttime exterior noise level standards, and will be *less than significant* impacts with mitigation.

Further, this analysis demonstrates that the unmitigated Project operational noise levels will not contribute a long-term operational noise level impact to the existing ambient noise environment at any of the sensitive receiver locations. Therefore, the operational noise level impacts associated with the proposed 24-hour seven days per week Project activities, such as the idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, roof-top air conditioning units, and parking lot vehicle movements, are considered *less than significant*.

OPERATIONAL NOISE MITIGATION

If receiver location R1 represents owned and/or occupied noise-sensitive uses at the time of Project operation, the following noise barrier is required to reduce the operational noise level impacts:

- A minimum 8-foot high noise barrier at the northern Project site boundary is required as shown on Exhibit ES-A. The barrier shall provide a weight of at least 4 pounds per square foot of face area with no decorative cutouts or line-of-sight openings between shielded areas and the roadways, or a minimum transmission loss of 20 dBA. (2) The barriers shall consist of a solid face from top to bottom. Unnecessary openings or decorative cutouts shall not be made. All gaps (except for weep holes) should be filled with grout or caulking. The noise barriers shall be constructed using the following materials:
    - Masonry block;
    - Earthen berm;
    - Or any combination of construction materials capable of the minimum weight of 4 pounds per square foot or a minimum transmission loss of 20 dBA.

OPERATIONAL VIBRATION ANALYSIS

The operation of the Project site will include heavy trucks moving on site to and from the loading dock areas. Truck vibration levels are dependent on vehicle characteristics, load, speed, and pavement conditions. Typical vibration levels for the 9th Street and Vineyard Avenue Warehouse heavy truck activity at normal traffic speeds will approach 0.004 in/sec PPV at 25 feet based on the FTA *Transit Noise Impact and Vibration Assessment.* (3) Trucks transiting on site will be travelling at very low speeds so it is expected that delivery truck vibration impacts at nearby homes will satisfy the Caltrans 0.04 in/sec PPV annoyance and 0.3 in/sec PPV building damage vibration thresholds, and therefore, will be *less than significant*.

CONSTRUCTION NOISE ANALYSIS

Construction-related noise impacts are expected to create temporary and intermittent high-level noise conditions at receivers surrounding the Project site. Using sample reference noise levels to represent the planned construction activities of the 9th Street and Vineyard Avenue Warehouse site, this analysis estimates the Project-related construction noise levels at nearby sensitive receiver locations. The Project-related short-term construction noise levels are expected to range from 51.9 to 76.6 dBA L_{eq} and will exceed the City of Rancho Cucamonga 65 dBA L_{eq} exterior noise level standard at sensitive receiver locations R1, R4, and R5; thereby representing a *potentially significant* noise impact.

Therefore, a 100-foot buffer zone mitigation measure is required which would restrict the use of large loaded trucks and dozers (greater than 80,000 pounds) within 100-feet of occupied sensitive receiver locations represented by R1, R4, and R5. In addition, the construction of the 8-foot high operational noise barrier mitigation shall be required prior to the start of Project construction. If it is not feasible to construct this barrier prior to Project construction, then equivalent, temporary construction noise barriers shall be required. With the mitigation

measures identified in this report, and shown on Exhibit ES-B, all nearby sensitive receiver locations will experience *less than significant* construction noise impacts.

CONSTRUCTION VIBRATION ANALYSIS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from Project construction activities would cause only intermittent, localized intrusion. This analysis shows the highest construction vibration levels are expected to approach 0.068 in/sec PPV, which is shown to exceed the Caltrans 0.04 in/sec PPV at receiver locations R1, R4, and R5; thereby representing a *potentially significant* vibration impact during Project construction.

Therefore, a 100-foot buffer zone mitigation measure is required which would restrict the use of large loaded trucks and dozers (greater than 80,000 pounds) within 100-feet of occupied sensitive receiver locations represented by R1, R4, and R5. With the mitigation measures outlined below, Project construction vibration levels would be reduced to 0.011 in/sec PPV, will satisfy the Caltrans 0.04 in/sec PPV annoyance threshold, and represent *less than significant* impacts with mitigation.

Further, the Project-related construction vibration levels do not represent levels capable of causing building damage to nearby residential homes. Caltrans identifies construction vibration levels capable of building damage approaching 0.3 in/sec PPV for older residential structures. (4) The peak, unmitigated Project-construction vibration levels approaching 0.068 in/sec PPV will remain below the Caltrans vibration levels for building damage at the residential homes near the Project site. Moreover, the impacts at the site of the closest sensitive receivers are unlikely to be sustained during the entire construction period, but will occur rather only during the times that heavy construction equipment is operating adjacent to the Project site perimeter.

CONSTRUCTION NOISE & VIBRATION MITIGATION

If receiver locations R1, R4, and R5 represent owned and/or occupied noise-sensitive uses at the time of Project construction, the following mitigation measures are required to reduce the construction noise and vibration level impacts:

- Large loaded trucks and dozers (greater than 80,000 pounds) shall not be used within 100 feet of owned and occupied noise-sensitive residential homes, as shown on Exhibit ES-B, represented by receiver locations R1, R4, and R5, during Project construction activities. Instead, small rubber-tired or alternative equipment shall be used within this area during Project construction to reduce vibration effects.
- Construct the minimum 8-foot high noise barrier as previously described to reduce Project operational noise levels at the northern Project site boundary, shown on Exhibit ES-B, prior to the start of Project construction activities.
    - If it is not feasible to construct the minimum 8-foot high noise barrier at the norther Project site boundary prior to Project construction, an equivalent, minimum 8-foot high temporary construction noise barrier is required at the Project's northern site boundary adjacent to the receiver location R1, for the duration of Project

construction activities. The noise control barriers must present a solid face from top to bottom. The noise control barrier must meet the minimum height and be constructed as follows:

- The barrier shall provide a minimum transmission loss of 20 dBA. (2) The noise barrier may be constructed using an acoustical blanket (e.g. vinyl acoustic curtains or quilted blankets) attached to the construction site perimeter fence or equivalent temporary fence posts;
- The noise barriers must be maintained and any damage promptly repaired. Gaps, holes, or weaknesses in the barrier or openings between the barrier and the ground shall be promptly repaired.
- The noise control barriers and associated elements shall be completely removed and the site appropriately restored upon the conclusion of the construction activity.

SUMMARY OF SIGNIFICANCE FINDINGS

The results of this 9th Street and Vineyard Avenue Warehouse Noise Impact Analysis are summarized below based on the significance criteria in Section 4 of this report. Table ES-1 shows the findings of significance for each potential noise and/or vibration impact before and after any required mitigation measures.

TABLE ES-1: SUMMARY OF SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
Operational Noise	7	*Potentially Significant*	*Less Than Significant*
Operational Vibration		*Less Than Significant*	-
Construction Noise	8	*Potentially Significant*	*Less Than Significant*
Construction Vibration		*Potentially Significant*	*Less Than Significant*

EXHIBIT ES-A: OPERATIONAL NOISE MITIGATION

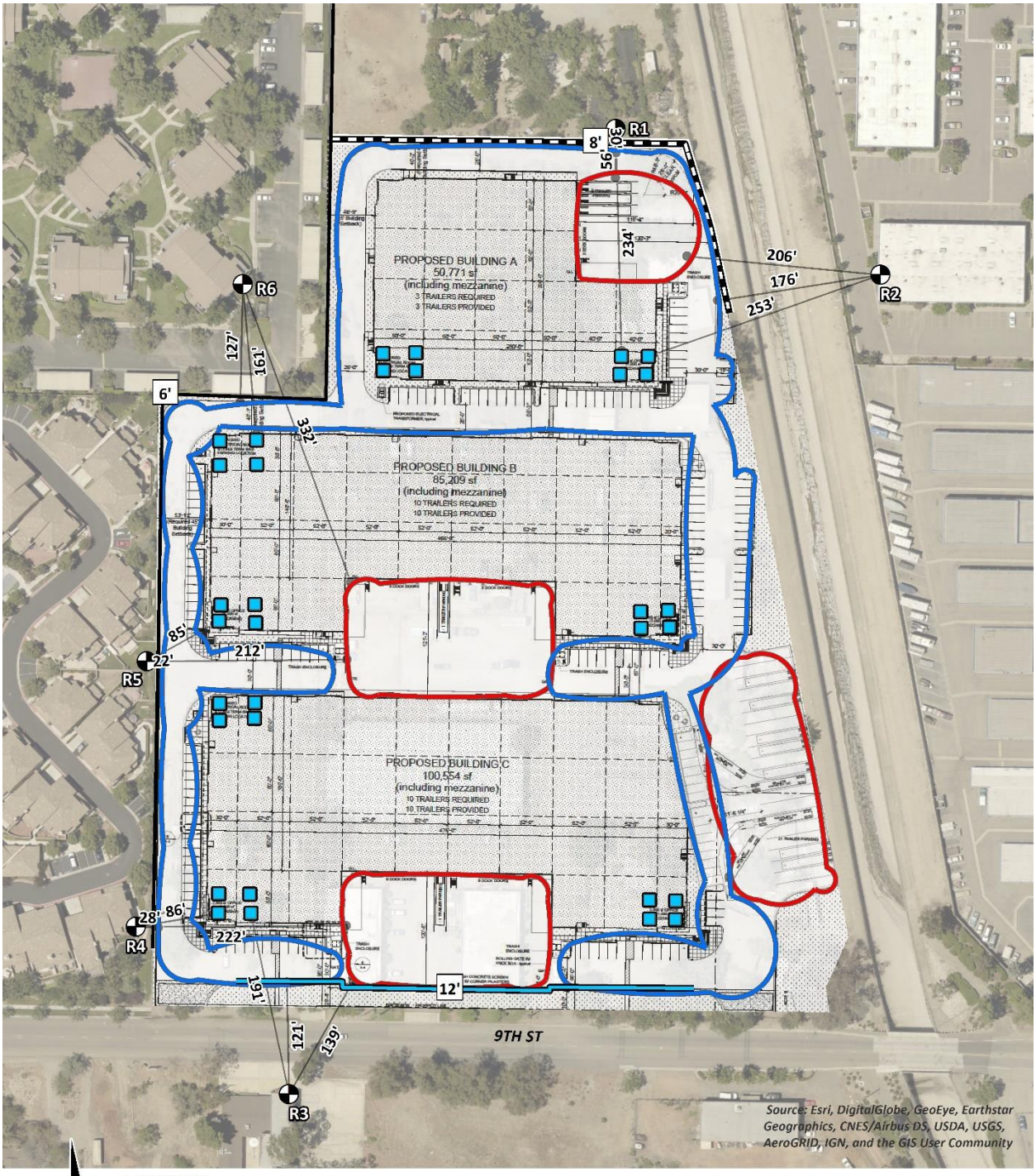
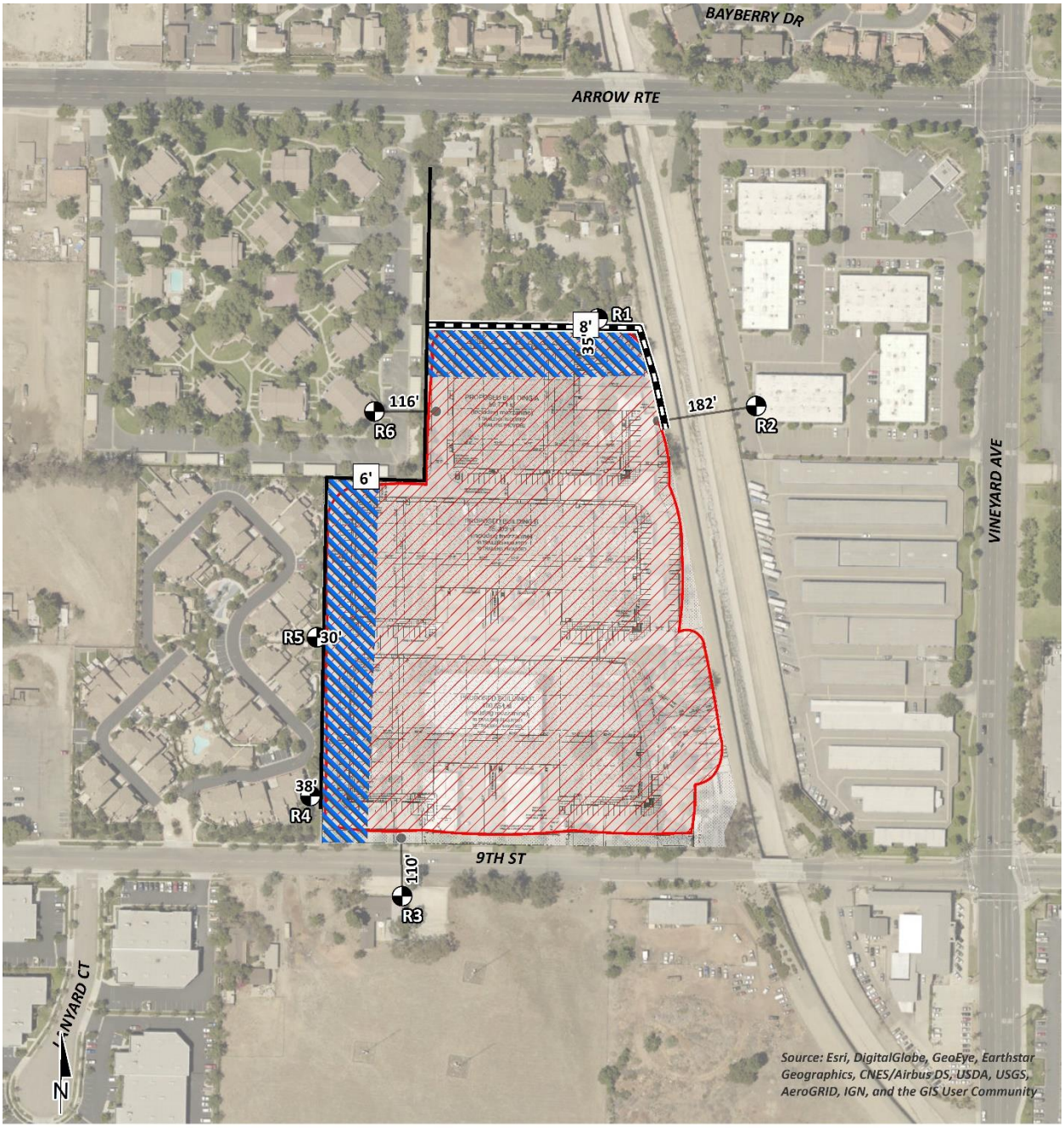


EXHIBIT ES-B: CONSTRUCTION NOISE & VIBRATION MITIGATION



LEGEND:

- Receiver Locations
- 8' Existing Barrier Height (in feet)
- Existing Barrier
- Recommended Noise Barrier
- Construction Activity
- Distance from receiver to construction activity (in feet)
- 100-foot buffer for large loaded trucks and heavy mobile equipment (> 80k lbs). and any owned and occupied residence within 100 feet.

1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of the proposed 9th Street and Vineyard Avenue Warehouse ("Project"). This noise study briefly describes the proposed Project, provides information regarding noise fundamentals, describes the local regulatory setting, provides the study methods and procedures for noise analysis, and evaluates the potential Project-related long-term operational and short-term construction noise and vibration impacts.

1.1 SITE LOCATION

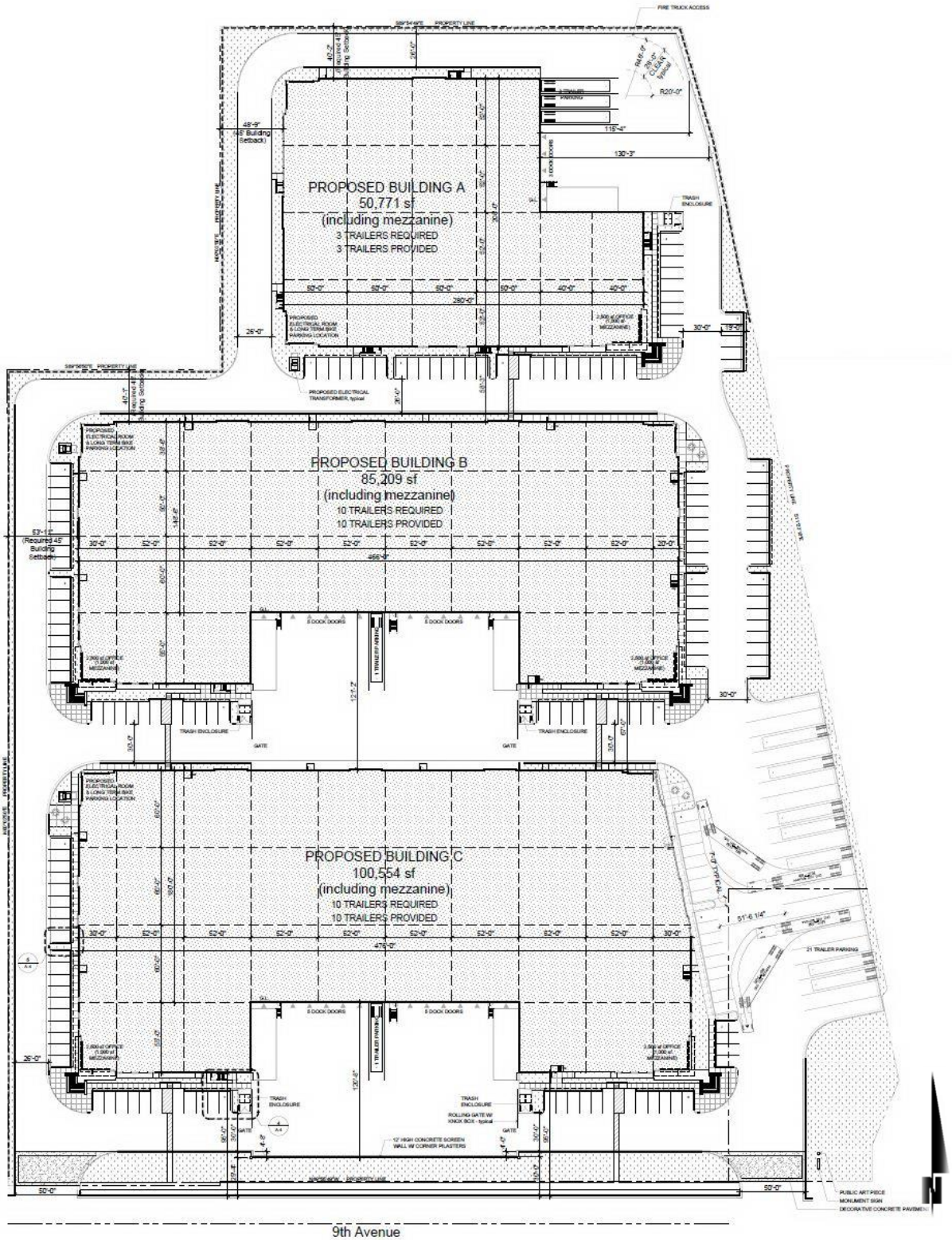
The proposed 9th Street and Vineyard Avenue Warehouse site is located west of Vineyard Avenue and north of 9th Street, in the City of Rancho Cucamonga, as shown on Exhibit 1-A.

1.2 PROJECT DESCRIPTION

The project proposes 235,480 square feet of warehousing uses, as shown on Exhibit 1-B. The on-site Project-related noise sources are expected to include: idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, roof-top air conditioning units, and parking lot vehicle movements. This noise analysis is intended to describe noise level impacts associated with the expected typical operational activities at the Project site.

EXHIBIT 1-A: LOCATION MAP

EXHIBIT 1-B: SITE PLAN



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2 FUNDAMENTALS

Noise has been simply defined as "unwanted sound." Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Noise is measured on a logarithmic scale of sound pressure level known as a decibel (dB). A-weighted decibels (dBA) approximate the subjective response of the human ear to broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies which are audible to the human ear. Exhibit 2-A presents a summary of the typical noise levels and their subjective loudness and effects that are described in more detail below.

EXHIBIT 2-A: TYPICAL NOISE LEVELS

COMMON OUTDOOR ACTIVITIES	COMMON INDOOR ACTIVITIES	A - WEIGHTED SOUND LEVEL dBA	SUBJECTIVE LOUDNESS	EFFECTS OF NOISE
THRESHOLD OF PAIN		140	INTOLERABLE OR DEAFENING	HEARING LOSS
NEAR JET ENGINE		130		
		120		
JET FLY-OVER AT 300m (1000 ft)	ROCK BAND	110		
LOUD AUTO HORN		100	VERY NOISY	
GAS LAWN MOWER AT 1m (3 ft)		90		
DIESEL TRUCK AT 15m (50 ft), at 80 km/hr (50 mph)	FOOD BLENDER AT 1m (3 ft)	80		SPEECH INTERFERENCE
NOISY URBAN AREA, DAYTIME	VACUUM CLEANER AT 3m (10 ft)	70	LOUD	
HEAVY TRAFFIC AT 90m (300 ft)	NORMAL SPEECH AT 1m (3 ft)	60		
QUIET URBAN DAYTIME	LARGE BUSINESS OFFICE	50	MODERATE	SLEEP DISTURBANCE
QUIET URBAN NIGHTTIME	THEATER, LARGE CONFERENCE ROOM (BACKGROUND)	40		
QUIET SUBURBAN NIGHTTIME	LIBRARY	30	FAINT	NO EFFECT
QUIET RURAL NIGHTTIME	BEDROOM AT NIGHT, CONCERT HALL (BACKGROUND)	20		
	BROADCAST/RECORDING STUDIO	10	VERY FAINT	
LOWEST THRESHOLD OF HUMAN HEARING	LOWEST THRESHOLD OF HUMAN HEARING	0		

Source: Environmental Protection Agency Office of Noise Abatement and Control, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (EPA/ONAC 550/9-74-004) March 1974.

2.1 RANGE OF NOISE

Since the range of intensities that the human ear can detect is so large, the scale frequently used to measure intensity is a scale based on multiples of 10, the logarithmic scale. The scale for measuring intensity is the decibel scale. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud. (5) The most common sounds vary between 40 dBA (very quiet) to 100 dBA (very loud). Normal conversation at three feet is roughly at 60 dBA, while loud jet engine noises equate to 110 dBA

at approximately 100 feet, which can cause serious discomfort. (6) Another important aspect of noise is the duration of the sound and the way it is described and distributed in time.

2.2 NOISE DESCRIPTORS

Environmental noise descriptors are generally based on averages, rather than instantaneous, noise levels. The most commonly used figure is the equivalent level (L_{eq}). Equivalent sound levels are not measured directly but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level (L_{eq}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period and is commonly used to describe the "average" noise levels within the environment.

Peak hour or average noise levels, while useful, do not completely describe a given noise environment. Noise levels lower than peak hour may be disturbing if they occur during times when quiet is most desirable, namely evening and nighttime (sleeping) hours. To account for this, the Community Noise Equivalent Level (CNEL), representing a composite 24-hour noise level is utilized. The CNEL is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time of day corrections require the addition of 5 decibels to dBA L_{eq} sound levels in the evening from 7:00 p.m. to 10:00 p.m., and the addition of 10 decibels to dBA L_{eq} sound levels at night between 10:00 p.m. and 7:00 a.m. These additions are made to account for the noise sensitive time periods during the evening and night hours when sound appears louder. CNEL does not represent the actual sound level heard at any time, but rather represents the total sound exposure. The City of Rancho Cucamonga relies on the 24-hour CNEL level to assess land use compatibility with transportation related noise sources.

2.3 SOUND PROPAGATION

When sound propagates over a distance, it changes in level and frequency content. The way noise reduces with distance depends on the following factors.

2.3.1 GEOMETRIC SPREADING

Sound from a localized source (i.e., a stationary point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source. (5)

2.3.2 GROUND ABSORPTION

The propagation path of noise from a highway to a receptor is usually very close to the ground. Noise attenuation from ground absorption and reflective wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually

sufficiently accurate for distances of less than 200 ft. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receptor, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receptor such as soft dirt, grass, or scattered bushes and trees), an excess ground attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance from a line source. (7)

2.3.3 ATMOSPHERIC EFFECTS

Receptors located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects. (5)

2.3.4 SHIELDING

A large object or barrier in the path between a noise source and a receptor can substantially attenuate noise levels at the receptor. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Shielding by trees and other such vegetation typically only has an "out of sight, out of mind" effect. That is, the perception of noise impact tends to decrease when vegetation blocks the line-of-sight to nearby residents. However, for vegetation to provide a substantial, or even noticeable, noise reduction, the vegetation area must be at least 15 feet in height, 100 feet wide and dense enough to completely obstruct the line-of sight between the source and the receiver. This size of vegetation may provide up to 5 dBA of noise reduction. The FHWA does not consider the planting of vegetation to be a noise abatement measure. (7)

2.4 NOISE CONTROL

Noise control is the process of obtaining an acceptable noise environment for an observation point or receptor by controlling the noise source, transmission path, receptor, or all three. This concept is known as the source-path-receptor concept. In general, noise control measures can be applied to these three elements.

2.5 NOISE BARRIER ATTENUATION

Effective noise barriers can reduce noise levels by 10 to 15 dBA, cutting the loudness of traffic noise in half. A noise barrier is most effective when placed close to the noise source or receptor. Noise barriers, however, do have limitations. For a noise barrier to work, it must be high enough and long enough to block the path of the noise source. (7)

2.6 LAND USE COMPATIBILITY WITH NOISE

Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches, and residences are more sensitive to noise intrusion than are commercial or industrial developments and related activities. As ambient noise levels affect the perceived amenity or livability of a development, so too can the mismanagement of noise impacts impair the economic health and growth potential of a community by reducing the area's desirability as a place to live, shop and work. For this reason, land use compatibility with the noise environment is an important consideration in the planning and design process. The FHWA encourages State and Local government to regulate land development in such a way that noise-sensitive land uses are either prohibited from being located adjacent to a highway, or that the developments are planned, designed, and constructed in such a way that noise impacts are minimized. (8)

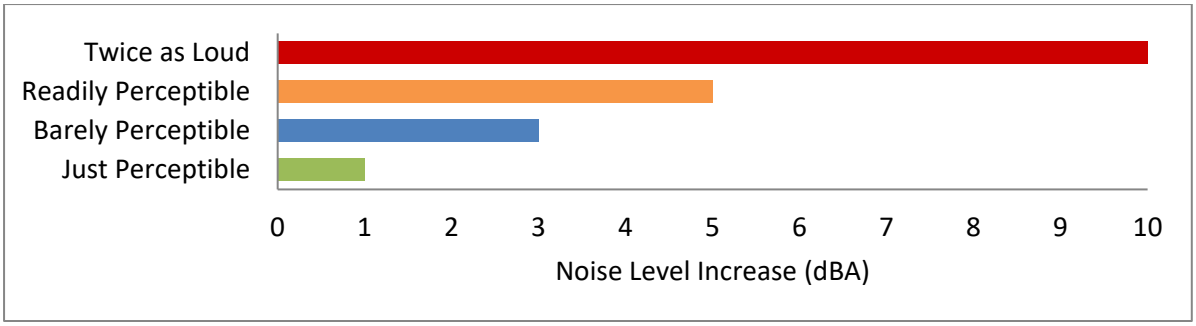
2.7 COMMUNITY RESPONSE TO NOISE

Community responses to noise may range from registering a complaint by telephone or letter, to initiating court action, depending upon everyone's susceptibility to noise and personal attitudes about noise. Several factors are related to the level of community annoyance including:

- Fear associated with noise producing activities;
- Socio-economic status and educational level;
- Perception that those affected are being unfairly treated;
- Attitudes regarding the usefulness of the noise-producing activity;
- Belief that the noise source can be controlled.

Approximately ten percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints will occur. Another twenty-five percent of the population will not complain even in very severe noise environments. Thus, a variety of reactions can be expected from people exposed to any given noise environment. (9) Surveys have shown that about ten percent of the people exposed to traffic noise of 60 dBA will report being highly annoyed with the noise, and each increase of one dBA is associated with approximately two percent more people being highly annoyed. When traffic noise exceeds 60 dBA or aircraft noise exceeds 55 dBA, people may begin to complain. (9) Despite this variability in behavior on an individual level, the population can be expected to exhibit the following responses to changes in noise levels as shown on Exhibit 2-B. An increase or decrease of 1 dBA cannot be perceived except in carefully controlled laboratory experiments, a change of 3 dBA are considered *barely perceptible*, and changes of 5 dBA are considered *readily perceptible*. (7)

EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION



2.8 EXPOSURE TO HIGH NOISE LEVELS

The Occupational Safety and Health Administration (OSHA) sets legal limits on noise exposure in the workplace. The permissible exposure limit (PEL) for a worker over an eight-hour day is 90 dBA. The OSHA standard uses a 5 dBA exchange rate. This means that when the noise level is increased by 5 dBA, the amount of time a person can be exposed to a certain noise level to receive the same dose is cut in half. The National Institute for Occupational Safety and Health (NIOSH) has recommended that all worker exposures to noise should be controlled below a level equivalent to 85 dBA for eight hours to minimize occupational noise induced hearing loss. NIOSH also recommends a 3 dBA exchange rate so that every increase by 3 dBA doubles the amount of the noise and halves the recommended amount of exposure time. (10)

OSHA has implemented requirements to protect all workers in general industry (e.g. the manufacturing and the service sectors) for employers to implement a Hearing Conservation Program where workers are exposed to a time weighted average noise level of 85 dBA or higher over an eight-hour work shift. Hearing Conservation Programs require employers to measure noise levels, provide free annual hearing exams and free hearing protection, provide training, and conduct evaluations of the adequacy of the hearing protectors in use unless changes to tools, equipment and schedules are made so that they are less noisy and worker exposure to noise is less than the 85 dBA. This noise study does not evaluate the noise exposure of workers within a project or construction site based on CEQA requirements, and instead, evaluates Project-related operational and construction noise levels at the nearby sensitive receiver locations in the Project study area. Further, periodic exposure to high noise levels in short duration, such as Project construction, is typically considered an annoyance and not impactful to human health. It would take several years of exposure to high noise levels to result in hearing impairment. (11)

2.9 VIBRATION

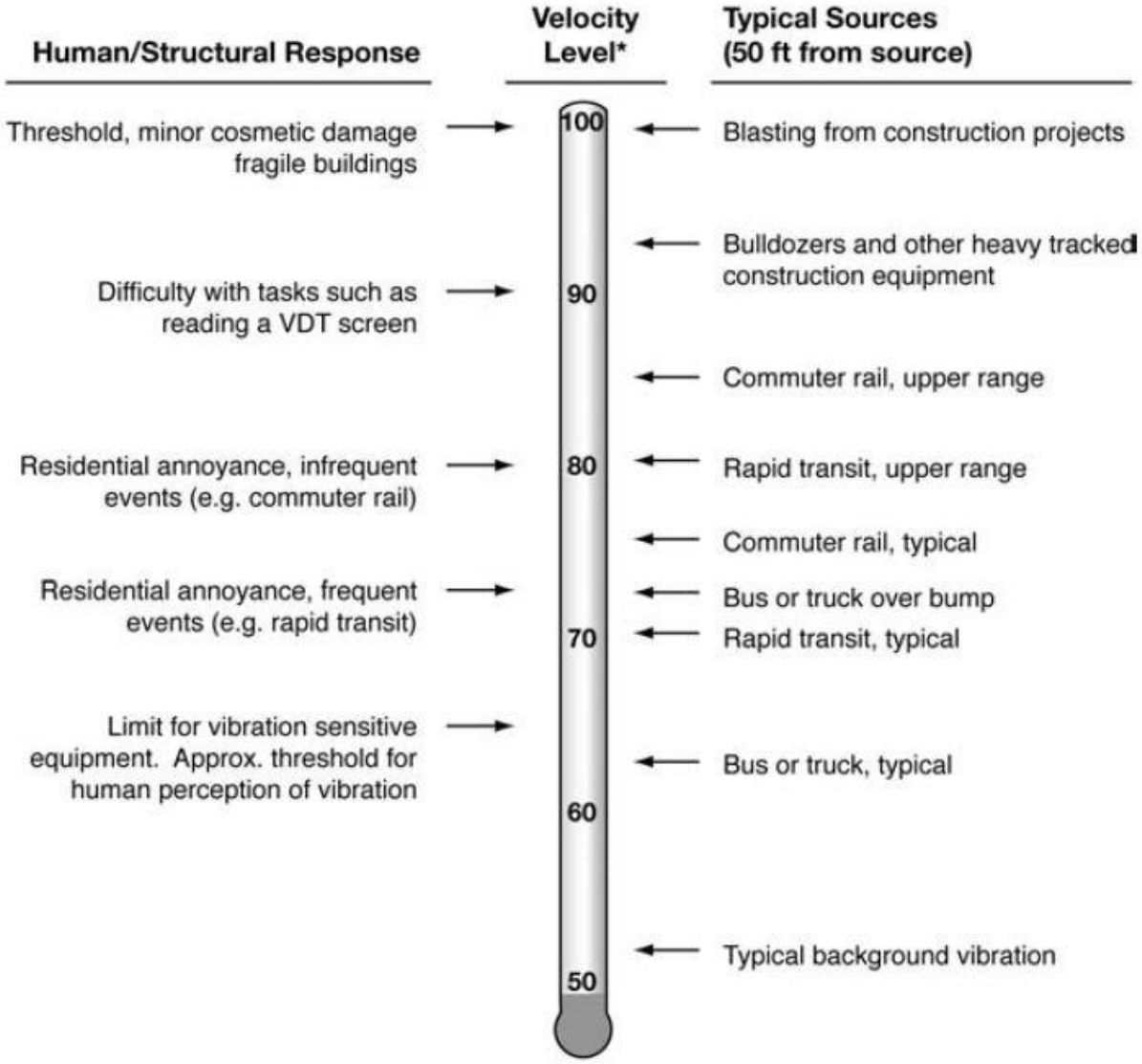
Per the Federal Transit Administration (FTA) *Transit Noise Impact and Vibration Assessment* (3), vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structure-borne noise. Sources of ground-borne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, such as factory machinery, or transient, such as explosions.

As is the case with airborne sound, ground-borne vibrations may be described by amplitude and frequency.

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings, but is not always suitable for evaluating human response (annoyance) because it takes some time for the human body to respond to vibration signals. Instead, the human body responds to average vibration amplitude often described as the root mean square (RMS). The RMS amplitude is defined as the average of the squared amplitude of the signal, and is most frequently used to describe the effect of vibration on the human body. Decibel notation (VdB) is commonly used to measure RMS. Decibel notation (VdB) serves to reduce the range of numbers used to describe human response to vibration. Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receivers for vibration include structures (especially older masonry structures), people (especially residents, the elderly, and sick), and vibration-sensitive equipment.

The background vibration-velocity level in residential areas is generally 50 VdB. Ground-borne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground-borne vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Exhibit 2-C illustrates common vibration sources and the human and structural response to ground-borne vibration.

EXHIBIT 2-C: TYPICAL LEVELS OF GROUND-BORNE VIBRATION



** RMS Vibration Velocity Level in VdB relative to 10^{-6} inches/second*

Source: Federal Transit Administration (FTA) Transit Noise Impact and Vibration Assessment.

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3 REGULATORY SETTING

To limit population exposure to physically and/or psychologically damaging as well as intrusive noise levels, the federal government, the State of California, various county governments, and most municipalities in the state have established standards and ordinances to control noise. In most areas, automobile and truck traffic is the major source of environmental noise. Traffic activity generally produces an average sound level that remains constant with time. Air and rail traffic, and commercial and industrial activities are also major sources of noise in some areas. Federal, state, and local agencies regulate different aspects of environmental noise. Federal and state agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources is left to local agencies.

3.1 STATE OF CALIFORNIA NOISE REQUIREMENTS

The State of California regulates freeway noise, sets standards for sound transmission, provides occupational noise control criteria, identifies noise standards, and provides guidance for local land use compatibility. State law requires that each county and city adopt a General Plan that includes a Noise Element which is to be prepared per guidelines adopted by the Governor's Office of Planning and Research (OPR). (12) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*.

3.2 STATE OF CALIFORNIA GREEN BUILDING STANDARDS CODE

The 2016 State of California's Green Building Standards Code contains mandatory measures for non-residential building construction in Section 5.507 on Environmental Comfort. (13) These noise standards are applied to new construction in California for controlling interior noise levels resulting from exterior noise sources. The regulations specify that acoustical studies must be prepared when non-residential structures are developed in areas where the exterior noise levels exceed 65 dBA CNEL, such as within a noise contour of an airport, freeway, railroad, and other areas where noise contours are not readily available. If the development falls within an airport or freeway 65 dBA CNEL noise contour, the combined sound transmission class (STC) rating of the wall and roof-ceiling assemblies must be at least 50. For those developments in areas where noise contours are not readily available and the noise level exceeds 65 dBA L_{eq} for any hour of operation, a wall and roof-ceiling combined STC rating of 45, and exterior windows with a minimum STC rating of 40 are required (Section 5.507.4.1).

3.3 CITY OF RANCHO CUCAMONGA PUBLIC HEALTH AND SAFETY ELEMENT

The City of Rancho Cucamonga has adopted a Public Health and Safety Element of the General Plan to minimize noise impacts on the community and to coordinate with surrounding jurisdictions and other entities regarding noise control. (14) The Public Health and Safety Element identifies noise-sensitive land uses and establishes compatibility guidelines for land use and noise. In addition, the Public Health and Safety Element identifies goals and policies to minimize the impacts of excessive noise levels throughout the community. The noise-related Public Health and Safety Element goals are as follows:

PS-13: Minimize the impacts of excessive noise levels throughout the community, and adopt appropriate noise level requirements for all land uses.

PS-14: Minimize the impacts of transportation-related noise.

The noise criteria identified in the City of Rancho Cucamonga Public Health and Safety Element (Figure PS-8) are guidelines to evaluate the land use compatibility of transportation-related noise. (14)

3.4 OPERATIONAL NOISE STANDARDS

To analyze noise impacts originating from a designated fixed location or private property such as the 9th Street and Vineyard Avenue Warehouse Project, operational source noise such as the expected idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, roof-top air conditioning units, and parking lot vehicle movements are typically evaluated against standards established under a City's Municipal Code.

For the City of Rancho Cucamonga, however, the operational noise standards are located in the Development Code. The City of Rancho Cucamonga Development Code, Chapter 17.66 *Performance Standards*, Section 17.66.050 *Noise Standards*, contains the exterior noise level limits for residential (Noise Zone 1) and commercial (Noise Zone 2) land uses, as shown on Table 3-1. Table 17.66.050-1 *Residential Noise Limits* of the Municipal Code identifies a daytime (7:00 a.m. to 10:00 p.m.) base noise level standard of 65 dBA L_{eq}, and a nighttime (10:00 p.m. to 7:00 a.m.) base noise level standard of 60 dBA L_{eq} for residential land uses. (15) The City of Rancho Cucamonga Development Code Performance Standards for noise are shown on Table 3-1 and included in Appendix 3.1.

TABLE 3-1: OPERATIONAL NOISE STANDARDS

City	Land Use	Time Period	Exterior Noise Level Standards (dBA L_{eq})[2]
Rancho Cucamonga[1]	Residential (Noise Zone I)	Daytime	65
		Nighttime	60
	Commercial (Noise Zone II)	Daytime	70
		Nighttime	65
	Industrial	Anytime	70

[1] Sources: City of Rancho Cucamonga Development Code, Table 17.66.050-1, Section 17.66.050 (G), and Table 17.66.110-1 (Appendix 3.1).
[2] L_{eq} represents a steady state sound level containing the same total energy as a time varying signal over a given sample period.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

3.5 CONSTRUCTION NOISE STANDARDS

To control noise impacts associated with the construction of the proposed Project the City of Rancho Cucamonga has established limits to the hours of operation and noise levels. According to Section 17.66.050(D)(4)(a) of the City of Rancho Cucamonga Development Code the following activities are exempt from the provisions of the noise standards: (15) *Noise sources associated with, or vibration created by, construction, repair, remodeling, or grading of any real property or during authorized seismic surveys, provided said activities:*

a. When adjacent to a residential land use, school, church or similar type of use, the noise generating activity does not take place between the hours of 8:00 p.m. and 7:00 a.m. on weekdays, including Saturday, or at any time on Sunday or a national holiday, and provided that noise levels created do not exceed the base noise level standard of 65 dBA when measured at the adjacent property line.

b. When adjacent to a commercial or industrial use, the noise generating activity does not take place between the hours of 10:00 p.m. and 6:00 a.m. on weekdays, including Saturday and Sunday, and provided noise levels created do not exceed the standards of 70 dBA at the adjacent property line.

The City of Rancho Cucamonga General Plan Land Use Element, Figure LU-2, shows that the Project site is adjacent to residential and non-residential land uses. If the Project demonstrates compliance with the standards for both types of uses, the construction noise level impacts are considered exempt from the noise standards. The City of Rancho Cucamonga Development Code Noise Standards for construction activities are shown on Table 3-2 and included in Appendix 3.1.

TABLE 3-2: CONSTRUCTION NOISE STANDARDS

City	Adjacent Land Use	Hours of Construction Activity	Construction Noise Level Standard (dBA L_{eq})
Rancho Cucamonga[1]	Residential, School, & Church	7:00 a.m. to 8:00 p.m. Monday to Saturday; no activity on Sundays or national holidays	65
	Commercial & Industrial	6:00 a.m. to 10:00 p.m. Monday to Sunday	70

[1] Source: City of Rancho Cucamonga Development Code, Section 17.66.050(D)(4) Special Exclusions (Appendix 3.1).
[2] Noise level standard when measured at the adjacent property line (Section 17.66.050(D)(4)).

3.6 VIBRATION STANDARDS

The City of Rancho Cucamonga Development Code, Section 17.66.070, identifies the City's vibration standards. However, Section 17.66.070(D) indicates that *vibrations from temporary construction/demolition and vehicles that leave the subject parcel (e.g., trucks, trains, and aircraft) are exempt from the provisions of this section.* (15) Based on these standards, vibration activity associated with Project truck trips and construction activity is considered exempt from the vibration standards of the City of Rancho Cucamonga.

Therefore, for analysis purposes, the Caltrans *Transportation and Construction Vibration Guidance Manual*, Table 19 and 20, vibration damage and annoyance criteria are used in this noise study to assess potential temporary construction-related impact at adjacent receiver locations. To assess the potential for building damage, the older residential building threshold of 0.3 in/sec PPV is used in this analysis. For sensitive residential receiver locations, potential annoyance due to construction-related vibration levels is also evaluated based on the Caltrans 0.04 in/sec PPV threshold. (4)

4 SIGNIFICANCE CRITERIA

The following significance criteria are based on currently adopted guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1) For the purposes of this report, impacts would be potentially significant if the Project results in or causes:

A. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

B. Generation of excessive ground-borne vibration or ground-borne noise levels?

C. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

While the City of Rancho Cucamonga General Plan Guidelines provide direction on noise compatibility and establish noise standards by land use type that are sufficient to assess the significance of noise impacts, they do not define the levels at which increases are considered substantial for use under Guideline A. CEQA Appendix G Guideline C applies to nearby public and private airports, if any, and the Project's land use compatibility.

4.1 CEQA GUIDELINES NOT FURTHER ANALYZED

The Project site is located roughly 2.7 miles north of Ontario International Airport and is not located within the vicinity of a private airstrip. As such, the Project site would not be exposed to excessive noise levels from airport operations, and therefore, impacts are considered *less than significant,* and no further noise analysis is conducted in relation to Guideline C.

4.2 NOISE-SENSITIVE RECEIVERS

Noise level increases resulting from the Project are evaluated based on the Appendix G CEQA Guidelines described above at the closest sensitive receiver locations. Under CEQA, consideration must be given to the magnitude of the increase, the existing ambient noise levels, and the location of noise-sensitive receivers to determine if a noise increase represents a significant adverse environmental impact. This approach recognizes *that there is no single noise increase that renders the noise impact significant.* (16)

Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or of the corresponding human reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted—the so-called *ambient* environment.

In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will typically be judged. The Federal Interagency Committee on Noise (FICON) (17) developed guidance to be used for the assessment of project-generated increases

in noise levels that consider the ambient noise level. The FICON recommendations are based on studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (CNEL) and equivalent continuous noise level (L_{eq}).

As previously stated, the approach used in this noise study recognizes *that there is no single noise increase that renders the noise impact significant*, based on a 2008 California Court of Appeal ruling on Gray v. County of Madera. (16) For example, if the ambient noise environment is quiet (<60 dBA) and the new noise source greatly increases the noise levels, an impact may occur if the noise criteria may be exceeded. Therefore, for this analysis, FICON identifies a *readily perceptible* 5 dBA or greater project-related noise level increase is considered a significant impact when the noise criteria for a given land use is exceeded. Per the FICON, in areas where the without project noise levels range from 60 to 65 dBA, a 3 dBA *barely perceptible* noise level increase appears to be appropriate for most people. When the without project noise levels already exceed 65 dBA, any increase in community noise louder than 1.5 dBA or greater is considered a significant impact if the noise criteria for a given land use is exceeded, since it likely contributes to an existing noise exposure exceedance. Table 4-1 below provides a summary of the potential noise impact significance criteria, based on guidance from FICON.

TABLE 4-1: SIGNIFICANCE OF NOISE IMPACTS AT NOISE-SENSITIVE RECEIVERS

Without Project Noise Level	Potential Significant Impact
< 60 dBA	5 dBA or more
60 - 65 dBA	3 dBA or more
> 65 dBA	1.5 dBA or more

Federal Interagency Committee on Noise (FICON), 1992.

4.3 SIGNIFICANCE CRITERIA SUMMARY

Noise impacts shall be considered significant if any of the following occur as a direct result of the proposed development. Table 4-2 shows the significance criteria summary matrix.

OPERATIONAL NOISE & VIBRATION

- If Project-related operational (stationary-source) noise levels exceed:
    - the 65 dBA L_{eq} daytime or 60 dBA L_{eq} nighttime residential exterior noise level standards at nearby residential receiver locations; or
    - the 70 dBA L_{eq} daytime or 65 dBA L_{eq} nighttime commercial exterior noise level standards at nearby commercial receiver locations; or
    - the 70 dBA L_{eq} industrial exterior noise level standards at adjacent industrial uses (City of Rancho Cucamonga Development Code, Section 17.66).
- If the existing ambient noise levels at the nearby noise-sensitive receivers (e.g., residential) near the Project site:

  - are less than 60 dBA L_{eq} and the Project creates a *readily perceptible* 5 dBA L_{eq} or greater Project-related noise level increase; or
  - range from 60 to 65 dBA L_{eq} and the Project creates a *barely perceptible* 3 dBA L_{eq} or greater Project-related noise level increase; or
  - already exceed 65 dBA L_{eq}, and the Project creates a community noise level impact of greater than 1.5 dBA L_{eq} (FICON, 1992).

- If long-term Project construction vibration levels exceed the Caltrans building damage vibration thresholds of 0.3 in/sec PPV at residential homes, or the human annoyance threshold of 0.04 in/sec PPV at sensitive receiver locations (Caltrans, *Transportation and Construction Vibration Guidance Manual*).

CONSTRUCTION NOISE & VIBRATION

- If Project-related construction activities:
  - create noise levels which exceed the 65 dBA L_{eq} noise level threshold at the nearby sensitive receiver locations; or
  - create noise levels which exceed the 70 dBA L_{eq} noise level threshold at the nearby commercial and/or industrial uses (City of Rancho Cucamonga Development Code, Section 17.66).
- If short-term Project construction vibration levels exceed the Caltrans building damage vibration thresholds of 0.3 in/sec PPV at residential homes, or the human annoyance threshold of 0.04 in/sec PPV at sensitive receiver locations (Caltrans, *Transportation and Construction Vibration Guidance Manual*).

TABLE 4-2: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Land Use	Condition(s)	Significance Criteria	
			Daytime	Nighttime
Operational Noise & Vibration	Residential	Exterior Noise Level Standards[1]	65 dBA L_{eq}	60 dBA L_{eq}
	Commercial		70 dBA L_{eq}	65 dBA L_{eq}
	Industrial		70 dBA L_{eq}	
	Noise-Sensitive	if ambient is < 60 dBA L_{eq}[2]	≥ 5 dBA L_{eq} Project increase	
		if ambient is 60 - 65 dBA L_{eq}[2]	≥ 3 dBA L_{eq} Project increase	
		if ambient is > 65 dBA L_{eq}[2]	≥ 1.5 dBA L_{eq} Project increase	
		Building Damage Vibration Level Threshold[3]	0.3 in/sec PPV	
		Annoyance Vibration Level Threshold[3]	0.04 in/sec PPV	
Construction Noise & Vibration	Residential	Exterior Noise Level Threshold[4]	65 dBA L_{eq}	n/a
	Non-Residential		70 dBA L_{eq}	n/a
	Noise-Sensitive	Building Damage Vibration Level Threshold[3]	0.3 in/sec PPV	n/a
		Annoyance Vibration Level Threshold[3]	0.04 in/sec PPV	n/a

[1] Source: City of Rancho Cucamonga Development Code, Table 17.66.050-1, Section 17.66.050 (G), and Table 17.66.110-1 (Appendix 3.1).
[2] Source: FICON, 1992.
[3] Source: Caltrans, Transportation and Construction Vibration Guidance Manual, Tables 19 and 20.
[4] Source: City of Rancho Cucamonga Development Code, Section 17.66 (Appendix 3.1).
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, 24-hour noise level measurements were taken at six locations in the Project study area. The receiver locations were selected to describe and document the existing noise environment within the Project study area. Exhibit 5-A provides the boundaries of the Project study area and the noise level measurement locations. To fully describe the existing noise conditions, noise level measurements were collected by Urban Crossroads, Inc. on Tuesday, March 19th, 2019. Appendix 5.1 includes study area photos.

5.1 MEASUREMENT PROCEDURE AND CRITERIA

To describe the existing noise environment, the hourly noise levels were measured during typical weekday conditions over a 24-hour period. By collecting individual hourly noise level measurements, it is possible to describe the daytime and nighttime hourly noise levels and calculate the 24-hour CNEL. The long-term noise readings were recorded using Piccolo Type 2 integrating sound level meter and dataloggers. The Piccolo sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 150. All noise meters were programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (18)

5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned as close to the nearest sensitive receiver locations as possible to assess the existing ambient hourly noise levels surrounding the Project site. Both Caltrans and the FTA recognize that it is not reasonable to collect noise level measurements that can fully represent every part of a private yard, patio, deck, or balcony normally used for human activity when estimating impacts for new development projects. This is demonstrated in the Caltrans general site location guidelines which indicate that, *sites must be free of noise contamination by sources other than sources of interest. Avoid sites located near sources such as barking dogs, lawnmowers, pool pumps, and air conditioners unless it is the express intent of the analyst to measure these sources*. (5) Further, FTA guidance states, t*hat it is not necessary nor recommended that existing noise exposure be determined by measuring at every noise-sensitive location in the project area. Rather, the recommended approach is to characterize the noise environment for clusters of sites based on measurements or estimates at representative locations in the community*. (3)

Based on recommendations of Caltrans and the FTA, it is not necessary to collect measurements at each individual building or residence, because each receiver measurement represents a group of buildings that share acoustical equivalence. (3) In other words, the area represented by the receiver shares similar shielding, terrain, and geometric relationship to the reference noise source. Receivers represent a location of noise sensitive areas and are used to estimate the future noise level impacts. Collecting reference ambient noise level measurements at the nearby sensitive receiver locations allows for a comparison of the before and after Project noise levels

and is necessary to assess potential noise impacts due to the Project's contribution to the ambient noise levels.

5.3 NOISE MEASUREMENT RESULTS

The noise measurements presented below focus on the average or equivalent sound levels (L_{eq}). The equivalent sound level (L_{eq}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. Table 5-1 identifies the hourly daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) noise levels at each noise level measurement location. Appendix 5.2 provides a summary of the existing hourly ambient noise levels described below:

- Location L1 represents the noise levels north of the Project site near existing residential homes on the north side of Arrow Route. The energy (logarithmic) average daytime noise level was calculated at 67.8 dBA L_{eq} with an average nighttime noise level of 62.2 dBA L_{eq}.
- Location L2 represents the noise levels east of the Project site, west of Vineyard Avenue near existing commercial and office uses. The energy (logarithmic) average daytime noise level was calculated at 52.5 dBA L_{eq} with an average nighttime noise level of 51.2 dBA L_{eq}.
- Location L3 represents the noise levels south of the Project site near existing commercial uses on the south side of 9th Street. The energy (logarithmic) average daytime noise level was calculated at 67.9 dBA L_{eq} with an average nighttime noise level of 62.3 dBA L_{eq}.
- Location L4 represents the noise levels west of the Project site on the north side of 9th Street near existing residential homes. The energy (logarithmic) average daytime noise level was calculated at 59.6 dBA L_{eq} with an average nighttime noise level of 53.9 dBA L_{eq}.
- Location L5 represents the noise levels adjacent to the northwestern portion of the Project site within an existing residential community south of Arrow Route. The energy (logarithmic) average daytime noise level was calculated at 51.2 dBA L_{eq} with an average nighttime noise level of 49.1 dBA L_{eq}.
- Location L6 represents the noise levels adjacent to the northwestern corner of the Project site boundaries in an existing residential community south of Arrow Route. The energy (logarithmic) average daytime noise level was calculated at 50.4 dBA L_{eq} with an average nighttime noise level of 49.4 dBA L_{eq}.

Table 5-1 provides the (energy average) noise levels used to describe the daytime and nighttime ambient conditions. These daytime and nighttime energy average noise levels represent the average of all hourly noise levels observed during these time periods expressed as a single number. Appendix 5.2 provides summary worksheets of the noise levels for each hour as well as the minimum, maximum, L_1, L_2, L_5, L_8, L_{25}, L_{50}, L_{90}, L_{95}, and L_{99} percentile noise levels observed during the daytime and nighttime periods.

The background ambient noise levels in the Project study area are dominated by the transportation-related noise associated the arterial roadway network, in addition to aircraft activities associated with Ontario International Airport. This includes the auto and heavy truck activities on study area roadway segments near the noise level measurement locations. The 24-hour existing noise level measurement results are shown on Table 5-1.

TABLE 5-1: 24-HOUR AMBIENT NOISE LEVEL MEASUREMENTS

Location[1]	Description	Energy Average Noise Level (dBA L_{eq})[2]	
		Daytime	Nighttime
L1	Located north of the Project site near existing residential homes on the north side of Arrow Route.	67.8	62.2
L2	Located east of the Project site, west of Vineyard Avenue near existing commercial and office uses.	52.5	51.2
L3	Located south of the Project site near existing commercial uses on the south side of 9th Street.	67.9	62.3
L4	Located west of the Project site on the north side of 9th Street near existing residential homes.	59.6	53.9
L5	Located adjacent to the northwestern portion of the Project site within an existing residential community south of Arrow Route.	51.2	49.1
L6	Located adjacent to the northwestern corner of the Project site boundaries in an existing residential community south of Arrow Route.	50.4	49.4

[1] See Exhibit 5-A for the noise level measurement locations.
[2] Energy (logarithmic) average levels. The long-term 24-hour measurement worksheets are included in Appendix 5.2.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS

6 RECEIVER LOCATIONS

To assess the potential for long-term operational and short-term construction noise impacts, the following receiver locations, as shown on Exhibit 6-A, were identified as representative locations for analysis. Sensitive receivers are generally defined as locations where people reside or where the presence of unwanted sound could otherwise adversely affect the use of the land. Noise-sensitive land uses are generally considered to include: schools, hospitals, single-family dwellings, mobile home parks, churches, libraries, and recreation areas. Moderately noise-sensitive land uses typically include: multi-family dwellings, hotels, motels, dormitories, out-patient clinics, cemeteries, golf courses, country clubs, athletic/tennis clubs, and equestrian clubs. Land uses that are considered relatively insensitive to noise include business, commercial, and professional developments. Land uses that are typically not affected by noise include: industrial, manufacturing, utilities, agriculture, natural open space, undeveloped land, parking lots, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals.

Sensitive receiver locations in the Project study area include residential uses, and non-noise-sensitive receiver locations include commercial and office uses, as described below. Other sensitive land uses in the Project study area that are located at greater distances than those identified in this noise study will experience lower noise levels than those presented in this report due to the additional attenuation from distance and the shielding of intervening structures.

R1: Located approximately 15 feet north of the Project site, R1 represents existing residential outdoor living areas (backyards) on the south side of Arrow Route. A 24-hour noise measurement was taken near this location, L1, to describe the existing ambient noise environment.

R2: Location R2 represents the existing commercial/office uses located east of the Project site at roughly 162 feet on the west side of Vineyard Avenue. A 24-hour noise measurement was taken near this location, L2, to describe the existing ambient noise environment.

R3: Location R3 represents existing commercial/office uses on the south side of 9th Street at approximately 90 feet south of the Project site. A 24-hour noise measurement near this location, L3, is used to describe the existing ambient noise environment.

R4: Location R4 represents existing residential outdoor living areas (backyards) located roughly 18 feet west of the Project site, north of 9th Street. A 24-hour noise measurement near this location, L4, is used to describe the existing ambient noise environment.

R5: Located approximately 10 feet west of the Project site, R5 represents existing residential outdoor living areas (backyards). A 24-hour noise measurement was taken near this location, L5, to describe the existing ambient noise environment.

R6: Location R6 represents the existing residential homes located west of the Project site at roughly 86 feet. A 24-hour noise measurement was taken near this location, L6, to describe the existing ambient noise environment.

EXHIBIT 6-A: RECEIVER LOCATIONS

7 OPERATIONAL NOISE IMPACTS

This section analyzes the potential stationary-source operational noise impacts at the nearby receiver locations, identified in Section 6, resulting from operation of the proposed 9th Street and Vineyard Avenue Warehouse Project. Exhibit 7-A identifies the representative receiver locations and noise source locations used to assess the operational noise levels.

7.1 OPERATIONAL NOISE SOURCES

The on-site Project-related noise sources are expected to include: idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, roof-top air conditioning units, and parking lot vehicle movements. This noise analysis is intended to describe noise level impacts associated with the expected typical operational activities at the Project site.

7.2 REFERENCE NOISE LEVELS

To estimate the Project operational noise impacts, reference noise level measurements were collected from similar types of activities to represent the noise levels expected with the development of the proposed Project. This section provides a detailed description of the reference noise level measurements shown on Table 7-1 used to estimate the Project operational noise impacts. It is important to note that the following projected noise levels assume the worst-case noise environment with the idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, roof-top air conditioning units, and parking lot vehicle movements all operating simultaneously. These noise level impacts will likely vary throughout the day.

7.2.1 TRUCK IDLING, DELIVERIES, BACKUP ALARMS, UNLOADING/LOADING, AND DOCKING

Short-term reference noise level measurements were collected on Wednesday, January 7th, 2015, by Urban Crossroads, Inc. at the Motivational Fulfillment & Logistics Services distribution facility located at 6810 Bickmore Avenue in the City of Chino. The noise level measurements represent the typical weekday dry goods logistics warehouse operation in a single building, of roughly 285,000 square feet, with a loading dock area on the western side of the building façade. Up to ten trucks were observed in the loading dock area including a combination of tractor trailer semi-trucks, two-axle delivery trucks, and background forklift operations.

The unloading/docking activity noise level measurement was taken over a fifteen-minute period and represents multiple noise sources taken from the center of loading dock activities generating a reference noise level of 62.8 dBA L_{eq} at a uniform reference distance of 50 feet. At this measurement location, the noise sources associated with employees unloading a docked truck container included the squeaking of the truck's shocks when weight was removed from the truck, employees playing music over a radio, as well as a forklift horn and backup alarm. In addition, during the noise level measurement a truck entered the loading dock area and proceeded to reverse and dock in a nearby loading bay, adding truck engine and air brakes noise.

7.2.2 ROOF-TOP AIR CONDITIONING UNITS

To assess the impacts created by the roof-top air conditioning units at the Project buildings, reference noise levels measurements were taken over a four-day total duration at the Santee Walmart on July 27th, 2015. Located at 170 Town Center Parkway in the City of Santee, the noise level measurements describe mechanical roof-top air conditioning units on the roof of an existing Walmart store, in addition to background noise levels from additional roof-top units. The reference noise level represents Lennox SCA120 series 10-ton model packaged air conditioning units. At 5 feet from the closest roof-top air conditioning unit, the highest exterior noise level from all four days of the measurement period was measured at 77.2 dBA L_{eq}. Using the uniform reference distance of 50 feet, the noise level is 57.2 dBA L_{eq}. The operating conditions of the reference noise level measurement reflect peak summer cooling requirements with measured temperatures approaching 96 degrees Fahrenheit (°F) with average daytime temperatures of 82°F. The roof-top air condition units were observed to operate the most during the daytime hours for a total of 39 minutes per hour. The noise attenuation provided by the planned 5-foot high parapet wall is not reflected in this reference noise level measurement.

7.2.3 PARKING LOT VEHICLE MOVEMENTS (AUTOS)

To determine the noise levels associated with parking lot vehicle movements, Urban Crossroads collected reference noise level measurements over a 24-hour period on May 17th, 2017 at the parking lot for the Panasonic Avionics Corporation in the City of Lake Forest. The peak hour of activity measured over the 24-hour noise level measurement period occurred between 12:00 p.m. to 1:00 p.m., or the typical lunch hour for employees working in the area. The measured reference noise level at 50 feet from parking lot vehicle movements was measured at 38.2 dBA L_{eq}. The parking lot noise levels are mainly due to cars pulling in and out of spaces during peak lunch hour activity and employees talking. Noise associated with parking lot vehicle movements is expected to operate for the entire hour (60 minutes).

TABLE 7-1: REFERENCE NOISE LEVEL MEASUREMENTS

Noise Source	Duration (hh:mm:ss)	Ref. Distance (Feet)	Noise Source Height (Feet)	Hourly Activity (Mins)[4]	Reference Noise Level (dBA L_{eq})	
					@ Ref. Dist.	@ 50 Feet
Truck Unloading/Docking Activity[1]	00:15:00	30'	8'	60	67.2	62.8
Roof-Top Air Conditioning Units[2]	96:00:00	5'	5'	39	77.2	57.2
Parking Lot Vehicle Movements[3]	01:00:00	10'	2.5'	60	52.2	38.2

[1] Reference noise level measurements were collected from the existing operations of the Motivational Fulfillment & Logistics Services distribution facility located at 6810 Bickmore Avenue in the City of Chino on Wednesday, January 7, 2015.
[2] As measured by Urban Crossroads, Inc. on 7/27/2015 at the Santee Walmart located at 170 Town Center Parkway.
[3] As measured by Urban Crossroads, Inc. on 5/17/2017 at the Panasonic Avionics Corporation parking lot in the City of Lake Forest.
[4] Anticipated duration (minutes within the hour) of noise activity during typical hourly conditions expected at the Project site based on the reference noise level measurement activity.

7.3 PROJECT OPERATIONAL NOISE LEVELS

Using the reference noise levels to represent the proposed Project operations that include idling trucks, delivery truck activities, backup alarms, as well as loading and unloading of dry goods, roof-top air conditioning units, and parking lot vehicle movements, Urban Crossroads, Inc. calculated the operational source noise levels that are expected to be generated at the Project site and the Project-related noise level increases that would be experienced at each of the sensitive receiver locations. The operational noise level calculations, shown on Table 7-2, account for the distance attenuation provided due to geometric spreading when sound from a localized stationary source (i.e., a point source) propagates uniformly outward in a spherical pattern. Hard site conditions are used in the operational noise analysis which result in noise levels that attenuate (or decrease) at a rate of 6 dBA for each doubling of distance from a point source. The basic noise attenuation equation shown below is used to calculate the distance attenuation based on a reference noise level (SPL_1):

$$SPL_2 = SPL_1 - 20\log(D_2/D_1)$$

Where SPL_2 is the resulting noise level after attenuation, SPL_1 is the source noise level, D_2 is the distance to the reference sound pressure level (SPL_1), and D_1 is the distance to the receiver location. Table 7-2 shows the individual operational noise levels of each noise source at each of the nearby sensitive receiver locations. As indicated on Table 7-2, the Project-only operational noise levels will range from 39.2 to 61.9 dBA L_{eq} at the sensitive receiver locations The unmitigated operational noise levels include the noise attenuation provided by the planned 5-foot high parapet walls used to screen the roof-top air conditioning units.

TABLE 7-2: UNMITIGATED PROJECT-ONLY OPERATIONAL NOISE LEVELS

Receiver Location[1]	Noise Levels by Noise Source (dBA L_{eq})[2]			Combined Operational Noise Levels (dBA L_{eq})
	Truck Unloading/ Docking Activity	Roof-Top Air Conditioning Units	Parking Lot Vehicle Movements	
R1	61.8	32.0	45.0	61.9
R2	50.5	35.5	33.5	50.7
R3	43.9	37.5	21.5	44.8
R4	44.7	41.6	37.0	46.9
R5	45.0	41.6	38.7	47.3
R6	28.6	38.5	26.8	39.2

[1] See Exhibit 7-A for the receiver and noise source locations.
[2] Reference noise sources as shown on Table 7-1. Individual noise source calculations are provided in Appendix 7.1.

EXHIBIT 7-A: OPERATIONAL NOISE SOURCE LOCATIONS

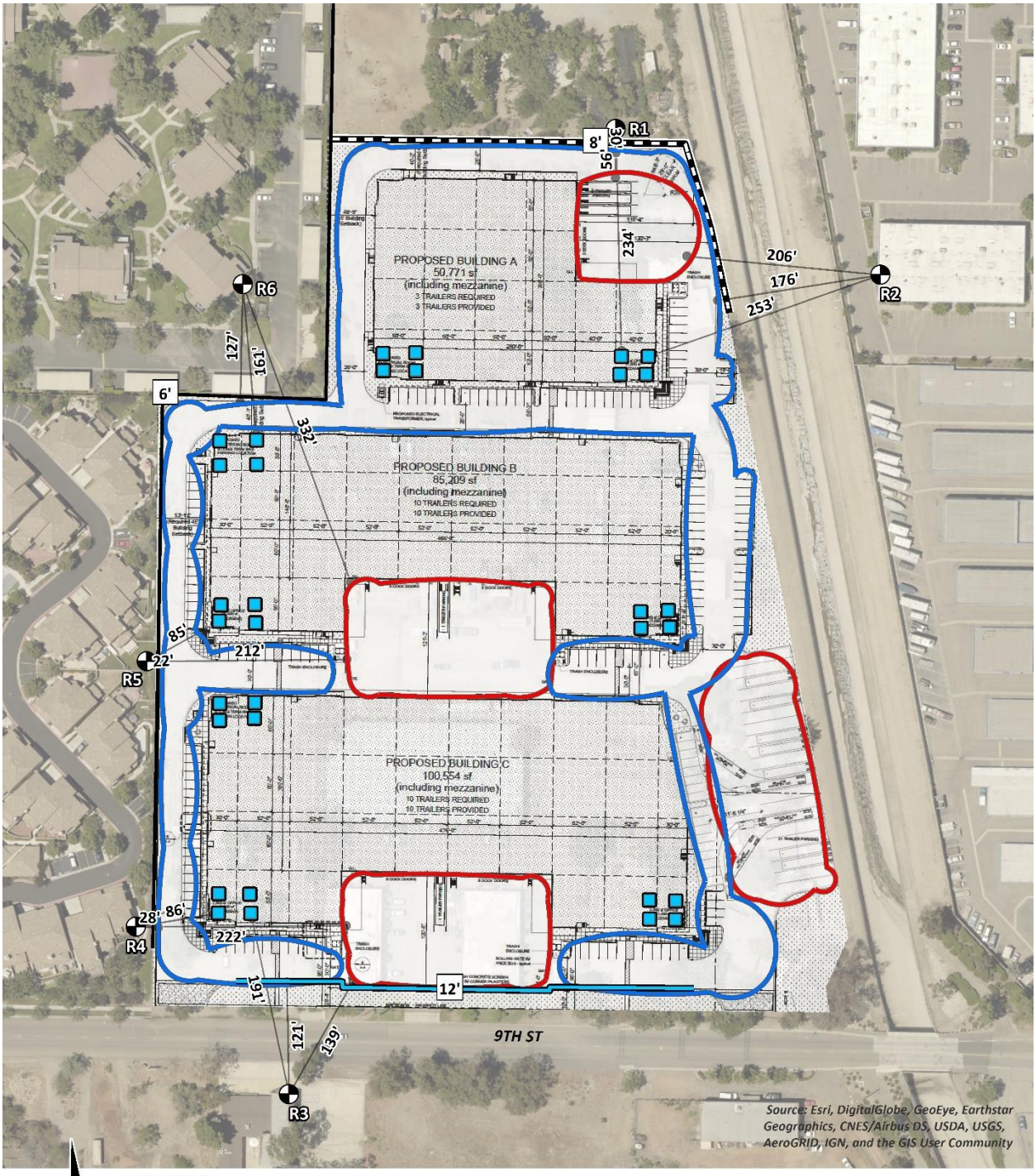


Table 7-3 shows the operational noise levels associated with 9th Street and Vineyard Avenue Warehouse Project will exceed the City of Rancho Cucamonga exterior noise level standards at receiver location R1 during the nighttime hours. Therefore, the Project-related operational noise level impacts are considered *potentially significant* impact at adjacent existing residential uses during the more sensitive nighttime hours. All other receiver locations will experience *less than significant* unmitigated noise impacts.

TABLE 7-3: UNMITIGATED OPERATIONAL NOISE LEVEL COMPLIANCE

Receiver Location[1]	Land Use	Noise Level at Receiver Locations (dBA L_{eq})[2]	Threshold		Threshold Exceeded?[3]	
			Daytime	Nighttime	Daytime	Nighttime
R1	Residential	61.9	65	60	No	Yes
R2	Commercial	50.7	70	65	No	No
R3	Commercial	44.8	70	65	No	No
R4	Residential	46.9	65	60	No	No
R5	Residential	47.3	65	60	No	No
R6	Residential	39.2	65	60	No	No

[1] See Exhibit 7-A for the receiver and noise source locations.
[2] Estimated Project operational noise levels as shown on Table 7-2.
[3] Do the estimated Project operational noise levels meet the operational noise level standards?
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

To reduce the *potentially significant* operational noise level impacts at the nearby receiver locations, the construction of a minimum 8-foot high noise barrier at the northern Project site boundary is required, as previously shown on Exhibit 7-A. With the noise barrier shown on Exhibit 7-A, further detailed in the Executive Summary, the Project operational noise levels approach 55.6 dBA L_{eq} at receiver location R1, as shown on Table 7-4. Table 9-5 shows that the Project operational noise levels will satisfy the City of Rancho Cucamonga exterior noise level standards are all receiver locations, and the Project operational noise impacts will be *less than significant* with mitigation.

TABLE 7-4: MITIGATED PROJECT-ONLY OPERATIONAL NOISE LEVELS

Receiver Location[1]	Mitigated Noise Levels by Noise Source (dBA L_{eq})[2]			Combined Operational Noise Levels (dBA L_{eq})
	Truck Unloading/ Docking Activity	Roof-Top Air Conditioning Units	Parking Lot Vehicle Movements	
R1	55.6	32.0	33.7	55.6
R2	50.5	35.5	33.5	50.7
R3	43.9	37.5	21.5	44.8
R4	44.7	41.6	37.0	46.9
R5	45.0	41.6	38.7	47.3
R6	28.6	38.5	26.8	39.2

[1] See Exhibit 7-A for the receiver and noise source locations.
[2] Reference noise sources as shown on Table 7-1. Individual noise source calculations are provided in Appendix 7.1.

TABLE 7-5: MITIGATED OPERATIONAL NOISE LEVEL COMPLIANCE

Receiver Location[1]	Land Use	Noise Level at Receiver Locations (dBA L_{eq})[2]	Threshold		Threshold Exceeded?[3]	
			Daytime	Nighttime	Daytime	Nighttime
R1	Residential	55.6	65	60	No	No
R2	Commercial	50.7	70	65	No	No
R3	Commercial	44.8	70	65	No	No
R4	Residential	46.9	65	60	No	No
R5	Residential	47.3	65	60	No	No
R6	Residential	39.2	65	60	No	No

[1] See Exhibit 7-A for the receiver and noise source locations.
[2] Estimated Project operational noise levels as shown on Table 7-4.
[3] Do the estimated Project operational noise levels meet the operational noise level standards?
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

7.4 PROJECT OPERATIONAL NOISE LEVEL CONTRIBUTIONS

To describe the Project operational noise level contributions, the Project operational noise levels are combined with the existing ambient noise levels measurements for the nearby receiver locations potentially impacted by Project operational noise sources. Since the units used to measure noise, decibels (dB), are logarithmic units, the Project-operational and existing ambient noise levels cannot be combined using standard arithmetic equations. (5) Instead, they must be logarithmically added using the following base equation:

$$SPL_{Total} = 10\log_{10}[10^{SPL1/10} + 10^{SPL2/10} + \ldots 10^{SPLn/10}]$$

Where "SPL1," "SPL2," etc. are equal to the sound pressure levels being combined, or in this case, the Project-operational and existing ambient noise levels. The difference between the combined Project and ambient noise levels describe the Project noise level contributions to the existing ambient noise environment. Noise levels that would be experienced at receiver locations when Project-source noise is added to the daytime and nighttime ambient conditions are presented on Tables 7-6 and 7-7, respectively.

As indicated on Tables 7-6 and 7-7, the Project will generate an unmitigated daytime operational noise level increase of up to 2.2 dBA L_{eq} and a nighttime operational noise level increase of up to 2.9 dBA L_{eq} at the nearby receiver locations. Since the Project-related operational noise level contributions will satisfy the operational noise level increase significance criteria presented in Table 4-2, the increases at the sensitive receiver locations will be *less than significant*. On this basis, Project operational stationary-source noise would not result in a substantial temporary/periodic, or permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project and impacts in these regards will be *less than significant*.

TABLE 7-6: PROJECT DAYTIME NOISE LEVEL CONTRIBUTIONS

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Threshold[7]	Threshold Exceeded?[7]
R1	61.9	L1	67.8	68.8	1.0	1.5	No
R2	50.7	L2	52.5	54.7	2.2	5.0	No
R3	44.8	L3	67.9	67.9	0.0	1.5	No
R4	46.9	L4	59.6	59.8	0.2	5.0	No
R5	47.3	L5	51.2	52.7	1.5	5.0	No
R6	39.2	L6	50.4	50.7	0.3	5.0	No

[1] See Exhibit 7-A for the sensitive receiver locations.
[2] Total Project operational noise levels as shown on Table 7-3.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed daytime ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance Criteria as defined in Section 4.

TABLE 7-7: PROJECT NIGHTTIME NOISE LEVEL CONTRIBUTIONS

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Threshold[7]	Threshold Exceeded?[7]
R1	61.9	L1	62.2	65.1	2.9	3.0	No
R2	50.7	L2	51.2	54.0	2.8	5.0	No
R3	44.8	L3	62.3	62.4	0.1	3.0	No
R4	46.9	L4	53.9	54.7	0.8	5.0	No
R5	47.3	L5	49.1	51.3	2.2	5.0	No
R6	39.2	L6	49.4	49.8	0.4	5.0	No

[1] See Exhibit 7-A for the sensitive receiver locations.
[2] Total Project operational noise levels as shown on Table 7-3.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed nighttime ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance Criteria as defined in Section 4.

7.5 OPERATIONAL VIBRATION IMPACTS

The operation of the Project site will include heavy trucks moving on site to and from the loading dock areas. Truck vibration levels are dependent on vehicle characteristics, load, speed, and pavement conditions. Typical vibration levels for the 9th Street and Vineyard Avenue Warehouse heavy truck activity at normal traffic speeds will approach 0.004 in/sec PPV at 25 feet based on the FTA *Transit Noise Impact and Vibration Assessment.* (3) Trucks transiting on site will be travelling at very low speeds so it is expected that delivery truck vibration impacts at nearby homes will satisfy the Caltrans 0.04 in/sec PPV annoyance and 0.3 in/sec PPV building damage vibration thresholds, and therefore, will be *less than significant*.

8 CONSTRUCTION IMPACTS

This section analyzes potential impacts resulting from the short-term construction activities associated with the development of the Project. Exhibit 8-A shows the construction noise source locations in relation to the nearby sensitive receiver locations previously described in Section 6.

8.1 CONSTRUCTION NOISE LEVELS

Noise generated by the Project construction equipment will include a combination of trucks, power tools, concrete mixers, and portable generators that when combined can reach high levels. The number and mix of construction equipment is expected to occur in the following stages:

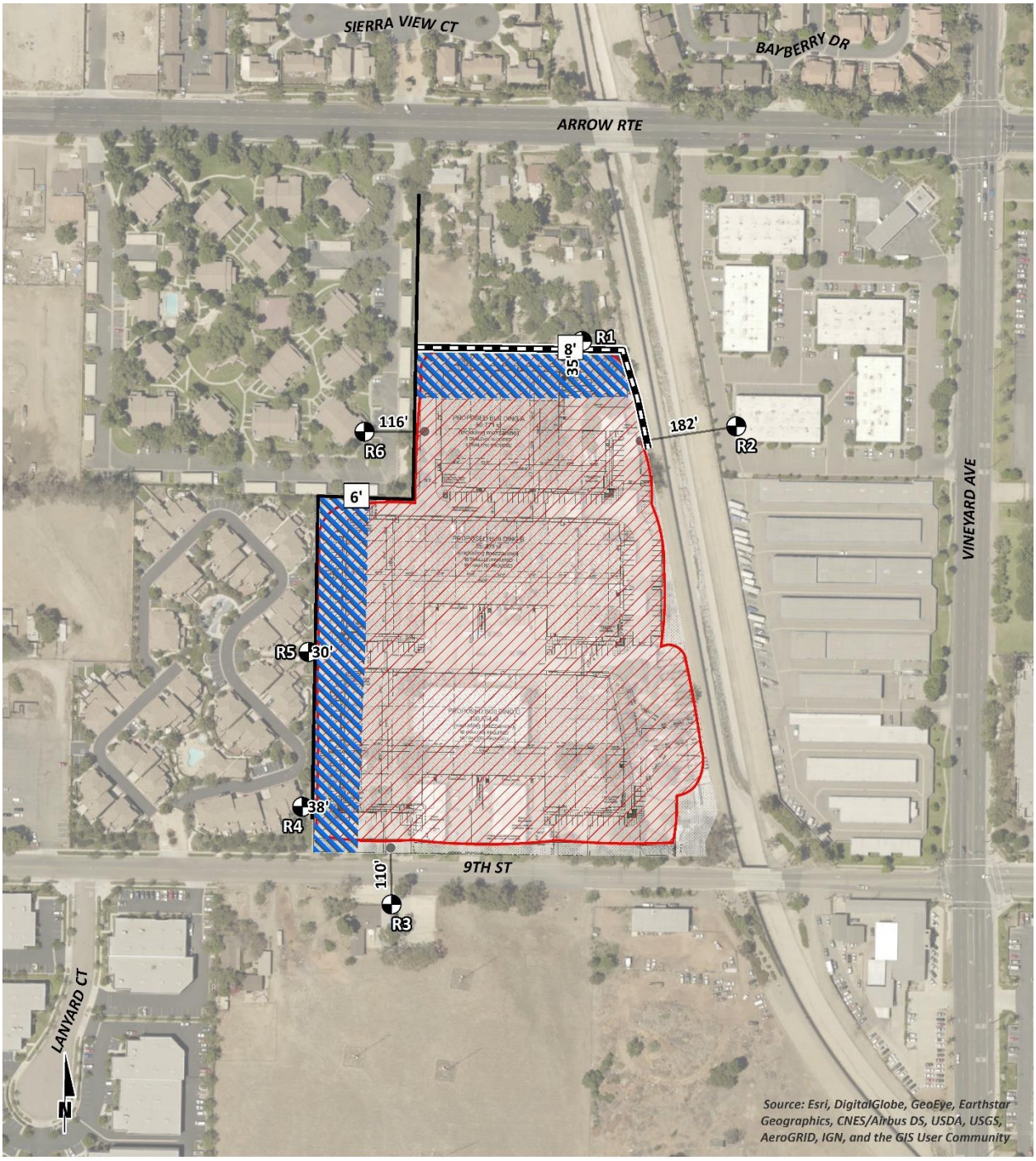
- Demolition
- Site Preparation
- Grading
- Building Construction
- Paving
- Architectural Coating

This construction noise analysis was prepared using reference noise level measurements taken by Urban Crossroads, Inc. to describe the typical construction activity noise levels for each stage of Project construction. The construction reference noise level measurements represent a list of typical construction activity noise levels. Noise levels generated by heavy construction equipment can range from approximately 68 dBA to more than 80 dBA when measured at 50 feet. However, these noise levels diminish with distance from the construction site at a rate of 6 dBA per doubling of distance. For example, a noise level of 80 dBA measured at 50 feet from the noise source to the receiver would be reduced to 74 dBA at 100 feet from the source to the receiver, and would be further reduced to 68 dBA at 200 feet from the source to the receiver. The construction stages and equipment used in this analysis are based on information provided in the *Air Quality Impact Analysis*. (19)

8.2 CONSTRUCTION REFERENCE NOISE LEVELS

To describe the Project construction noise levels, measurements were collected for similar activities at several construction sites. Table 8-1 provides a summary of the construction reference noise level measurements. Since the reference noise levels were collected at varying distances of 30 feet and 50 feet, all construction noise level measurements presented on Table 8-1 have been adjusted for consistency to describe a uniform reference distance of 50 feet.

EXHIBIT 8-A: CONSTRUCTION NOISE SOURCE LOCATIONS



LEGEND:

- Receiver Locations
- 8' Existing Barrier Height (in feet)
- Existing Barrier
- Construction Activity
- Distance from receiver to construction activity (in feet)
- 100-foot buffer for large loaded trucks and heavy mobile equipment (> 80k lbs).
- Recommended Noise Barrier

TABLE 8-1: CONSTRUCTION REFERENCE NOISE LEVELS

ID	Noise Source	Duration (h:mm:ss)	Reference Distance From Source (Feet)	Reference Noise Levels @ Reference Distance (dBA L_{eq})	Reference Noise Levels @ 50 Feet (dBA L_{eq})[6]
1	Truck Pass-Bys & Dozer Activity[1]	0:01:15	30'	63.6	59.2
2	Dozer Activity[1]	0:01:00	30'	68.6	64.2
3	Construction Vehicle Maintenance Activities[2]	0:01:00	30'	71.9	67.5
4	Foundation Trenching[2]	0:01:01	30'	72.6	68.2
5	Rough Grading Activities[2]	0:05:00	30'	77.9	73.5
6	Framing[3]	0:02:00	30'	66.7	62.3
8	Concrete Mixer Truck Movements[4]	0:01:00	50'	71.2	71.2
9	Concrete Paver Activities[4]	0:01:00	30'	70.0	65.6
10	Concrete Mixer Pour & Paving Activities[4]	0:01:00	30'	70.3	65.9
11	Concrete Mixer Backup Alarms & Air Brakes[4]	0:00:20	50'	71.6	71.6
12	Concrete Mixer Pour Activities[4]	1:00:00	50'	67.7	67.7
13	Forklift, Jackhammer, & Metal Truck Bed Loading[5]	0:02:06	50'	67.9	67.9

[1] As measured by Urban Crossroads, Inc. on 10/14/15 at a business park construction site located at the northwest corner of Barranca Parkway and Alton Parkway in the City of Irvine.
[2] As measured by Urban Crossroads, Inc. on 10/20/15 at a construction site located in Rancho Mission Viejo.
[3] As measured by Urban Crossroads, Inc. on 10/20/15 at a residential construction site located in Rancho Mission Viejo.
[4] Reference noise level measurements were collected from a nighttime concrete pour at an industrial construction site, located at 27334 San Bernardino Avenue in the City of Redlands, between 1:00 a.m. to 2:00 a.m. on 7/1/15.
[5] As measured by Urban Crossroads, Inc. on 9/9/16 during the demolition of an existing paved parking lot in Irvine.
[6] Reference noise levels are calculated at 50 feet using a drop off rate of 6 dBA per doubling of distance (point source).

8.3 CONSTRUCTION NOISE ANALYSIS

Using the reference construction equipment noise levels, calculations of the Project construction noise level impacts at the nearby sensitive receiver locations were completed. Tables 8-2 to 8-7 present the short-term construction noise levels for each stage of construction. Table 8-8 provides a summary of the construction noise levels by stage at the nearby noise-sensitive receiver locations. Based on the stages of construction, the noise impacts associated with the proposed Project are expected to create temporarily high noise levels at the nearby receiver locations. To assess the worst-case construction noise levels, this analysis shows the highest noise impacts when the equipment with the highest reference noise level is operating at the closest point from the edge of primary construction activity to each receiver location.

TABLE 8-2: DEMOLITION EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Truck Pass-Bys & Dozer Activity	59.2
Dozer Activity	64.2
Forklift, Jackhammer, & Metal Truck Bed Activities	67.9
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	67.9

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Estimated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	35'	3.1	0.0	71.0
R2	182'	-11.2	0.0	56.7
R3	110'	-6.8	0.0	61.1
R4	38'	2.4	-5.0	65.3
R5	30'	4.4	-5.0	67.3
R6	116'	-7.3	-5.0	55.6

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier attenuation from existing barriers/structures in the Project study area.

TABLE 8-4: SITE PREPARATION EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Truck Pass-Bys & Dozer Activity	59.2
Dozer Activity	64.2
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	64.2

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Estimated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	35'	3.1	0.0	67.3
R2	182'	-11.2	0.0	52.9
R3	110'	-6.8	0.0	57.3
R4	38'	2.4	-5.0	61.5
R5	30'	4.4	-5.0	63.6
R6	116'	-7.3	-5.0	51.9

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier attenuation from existing barriers/structures in the Project study area.

TABLE 8-4: GRADING EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Truck Pass-Bys & Dozer Activity	59.2
Dozer Activity	64.2
Rough Grading Activities	73.5
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	73.5

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Estimated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	35'	3.1	0.0	76.6
R2	182'	-11.2	0.0	62.2
R3	110'	-6.8	0.0	66.6
R4	38'	2.4	-5.0	70.8
R5	30'	4.4	-5.0	72.9
R6	116'	-7.3	-5.0	61.2

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier attenuation from existing barriers/structures in the Project study area.

TABLE 8-5: BUILDING CONSTRUCTION EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Construction Vehicle Maintenance Activities	67.5
Foundation Trenching	68.2
Framing	62.3
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	68.2

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Estimated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	35'	3.1	0.0	71.3
R2	182'	-11.2	0.0	56.9
R3	110'	-6.8	0.0	61.3
R4	38'	2.4	-5.0	65.5
R5	30'	4.4	-5.0	67.6
R6	116'	-7.3	-5.0	55.9

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier attenuation from existing barriers/structures in the Project study area.

TABLE 8-6: PAVING EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Concrete Mixer Truck Movements	71.2
Concrete Paver Activities	65.6
Concrete Mixer Pour & Paving Activities	65.9
Concrete Mixer Backup Alarms & Air Brakes	71.6
Concrete Mixer Pour Activities	67.7
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	71.6

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Estimated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	35'	3.1	0.0	74.7
R2	182'	-11.2	0.0	60.4
R3	110'	-6.8	0.0	64.8
R4	38'	2.4	-5.0	69.0
R5	30'	4.4	-5.0	71.0
R6	116'	-7.3	-5.0	59.3

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier attenuation from existing barriers/structures in the Project study area.

TABLE 8-7: ARCHITECTURAL COATING EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Construction Vehicle Maintenance Activities	67.5
Framing	62.3
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	67.5

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Estimated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	35'	3.1	0.0	70.6
R2	182'	-11.2	0.0	56.2
R3	110'	-6.8	0.0	60.6
R4	38'	2.4	-5.0	64.8
R5	30'	4.4	-5.0	66.9
R6	116'	-7.3	-5.0	55.2

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Estimated barrier attenuation from existing barriers/structures in the Project study area.

8.4 CONSTRUCTION NOISE THRESHOLDS OF SIGNIFICANCE

The construction noise analysis shows that the highest construction noise levels will occur when construction activities take place at the closest point from primary Project construction activity to each of the nearby receiver locations. As shown on Table 8-8, the unmitigated construction noise levels are expected to range from 51.9 to 76.6 dBA L_{eq} at the nearby receiver locations.

TABLE 8-8: UNMITIGATED CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY (DBA L_{EQ})

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})						
	Demolition	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Levels[2]
R1	71.0	67.3	76.6	71.3	74.7	70.6	76.6
R2	56.7	52.9	62.2	56.9	60.4	56.2	62.2
R3	61.1	57.3	66.6	61.3	64.8	60.6	66.6
R4	65.3	61.5	70.8	65.5	69.0	64.8	70.8
R5	67.3	63.6	72.9	67.6	71.0	66.9	72.9
R6	55.6	51.9	61.2	55.9	59.3	55.2	61.2

[1] Noise receiver locations are shown on Exhibit 8-A.
[2] Estimated construction noise levels during peak operating conditions.

Table 8-9 shows the Project-related short-term construction noise levels are expected to range from 51.9 to 76.6 dBA L_{eq} and will exceed the City of Rancho Cucamonga 65 dBA L_{eq} exterior noise level standard at sensitive receiver locations R1, R4, and R5; thereby representing a *potentially significant* noise impact.

TABLE 8-9: UNMITIGATED CONSTRUCTION EQUIPMENT NOISE LEVEL COMPLIANCE

Receiver Location[1]	Land Use	Unmitigated Construction Noise Levels (dBA L_{eq})		
		Highest Levels[2]	Threshold[3]	Threshold Exceeded?[4]
R1	Residential	76.6	65	Yes
R2	Commercial	62.2	70	No
R3	Commercial	66.6	70	No
R4	Residential	70.8	65	Yes
R5	Residential	72.9	65	Yes
R6	Residential	61.2	65	No

[1] Noise receiver locations are shown on Exhibit 8-A.
[2] Estimated construction noise levels during peak operating conditions, as shown on Table 8-8.
[3] Construction noise level threshold as shown on Table 4-2.
[4] Do the estimated Project construction noise levels exceed the construction noise level threshold?

Therefore, a 100-foot buffer zone mitigation measure is required which would restrict the use of large loaded trucks and dozers (greater than 80,000 pounds) within 100-feet of occupied sensitive receiver locations represented by R1, R4, and R5. In addition, the construction of the 8-foot high operational noise barrier mitigation shall be required prior to the start of Project construction. If it is not feasible to construct this barrier prior to Project construction, then equivalent, temporary construction noise barriers shall be required. With the mitigation measures outlined in the Executive Summary, and shown on Exhibit 8-A, all nearby sensitive receiver locations will experience *less than significant* construction noise impacts, as shown on Table 8-10.

TABLE 8-10: MITIGATED CONSTRUCTION EQUIPMENT NOISE LEVEL COMPLIANCE

Receiver Location[1]	Land Use	Highest Unmitigated Levels[2]	Mitigated Construction Noise Levels (dBA L_{eq})				
			Heavy Equipment Buffer Attenuation	Required Noise Barrier Attenuation	Resulting With Mitigation Measures	Threshold[3]	Threshold Exceeded?[4]
R1	Residential	76.6	-9.1	-6.2	61.2	65	No
R2	Commercial	62.2	0.0	0.0	62.2	70	No
R3	Commercial	66.6	0.0	0.0	66.6	70	No
R4	Residential	70.8	-8.4	0.0	62.4	65	No
R5	Residential	72.9	-10.5	0.0	62.4	65	No
R6	Residential	61.2	0.0	0.0	61.2	65	No

[1] Noise receiver locations are shown on Exhibit 8-A.
[2] Estimated construction noise levels during peak operating conditions, as shown on Table 8-9.
[3] Construction noise level threshold as shown on Table 4-2.
[4] Do the estimated Project construction noise levels exceed the construction noise level threshold?

8.5 VIBRATION ASSESSMENT

This analysis focuses on the potential ground-borne vibration associated with vehicular traffic and construction activities. Ground-borne vibration levels from automobile traffic are generally overshadowed by vibration generated by heavy trucks that roll over the same uneven roadway surfaces. However, due to the rapid drop-off rate of ground-borne vibration and the short duration of the associated events, vehicular traffic-induced ground-borne vibration is rarely perceptible beyond the roadway right-of-way, and rarely results in vibration levels that cause damage to buildings in the vicinity.

However, while vehicular traffic is rarely perceptible, construction has the potential to result in varying degrees of temporary ground vibration, depending on the specific construction activities and equipment used. Ground vibration levels associated with various types of construction equipment are summarized on Table 8-11. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the human response (annoyance) using the following vibration assessment methods defined by the FTA. To

describe the human response (annoyance) associated with vibration impacts the FTA provides the following equation: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$

TABLE 8-11: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	PPV (in/sec) at 25 feet
Small bulldozer	0.003
Jackhammer	0.035
Loaded Trucks	0.076
Large bulldozer	0.089

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment, September 2018.

8.6 CONSTRUCTION VIBRATION IMPACTS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from Project construction activities would cause only intermittent, localized intrusion. The proposed Project's construction activities most likely to cause vibration impacts are:

- Heavy Construction Equipment: Although all heavy mobile construction equipment has the potential of causing at least some perceptible vibration while operating close to buildings, the vibration is usually short-term and is not of sufficient magnitude to cause building damage.
- Trucks: Trucks hauling building materials to construction sites can be sources of vibration intrusion if the haul routes pass through residential neighborhoods on streets with bumps or potholes. Repairing the bumps and potholes generally eliminates the problem.

Ground-borne vibration levels resulting from construction activities occurring within the Project site were estimated by data published by the Federal Transit Administration. Construction activities that would have the potential to generate low levels of ground-borne vibration within the Project site include grading. Using the vibration source level of construction equipment provided on Table 8-11 and the construction vibration assessment methodology published by the FTA, it is possible to estimate the Project vibration impacts. Table 8-12 presents the expected Project related vibration levels at the nearby receiver locations.

This analysis shown on Table 8-12 indicates the highest construction vibration levels are expected to approach 0.068 in/sec PPV, which is shown to exceed the Caltrans 0.04 in/sec PPV at receiver locations R1, R4, and R5; thereby representing a *potentially significant* vibration impact during Project construction.

TABLE 8-12: UNMITIGATED PROJECT CONSTRUCTION VIBRATION LEVELS

Receiver[1]	Distance to Const. Activity (Feet)	Receiver PPV Levels (in/sec)[2]					Threshold		Threshold Exceeded?[3]	
		Small Bulldozer	Jack-hammer	Loaded Trucks	Large Bulldozer	Peak Vibration	Building Damage	Annoyance	Building Damage	Annoyance
R1	35'	0.002	0.021	0.046	0.054	0.054	0.3	0.04	No	Yes
R2	182'	0.000	0.002	0.004	0.005	0.005	0.3	0.04	No	No
R3	110'	0.000	0.004	0.008	0.010	0.010	0.3	0.04	No	No
R4	38'	0.002	0.019	0.041	0.047	0.047	0.3	0.04	No	Yes
R5	30'	0.002	0.027	0.058	0.068	0.068	0.3	0.04	No	Yes
R6	116'	0.000	0.004	0.008	0.009	0.009	0.3	0.04	No	No

[1] Receiver locations are shown on Exhibit 8-A.
[2] Based on the Vibration Source Levels of Construction Equipment included on Table 8-11.
[3] Does the peak vibration exceed the vibration thresholds shown on Table 4-2?

Therefore, a 100-foot buffer zone mitigation measure is required which would restrict the use of large loaded trucks and dozers (greater than 80,000 pounds) within 100-feet of occupied sensitive receiver locations represented by R1, R4, and R5. With the mitigation measures outlined in the Executive Summary, Project construction vibration levels would be reduced to 0.011 in/sec PPV as shown on Table 8-13, will satisfy the Caltrans 0.04 in/sec PPV annoyance threshold, and represent *less than significant* impacts with mitigation.

TABLE 8-13: MITIGATED PROJECT CONSTRUCTION VIBRATION LEVELS

Receiver[1]	Distance to Const. Activity (Feet)	Mitigated Receiver PPV Levels (in/sec)[2]					Threshold		Threshold Exceeded?[3]	
		Small Bulldozer	Jack-hammer	Loaded Trucks	Large Bulldozer	Peak Vibration	Building Damage	Annoyance	Building Damage	Annoyance
R1	100'	-	-	0.010	0.011	0.011	0.3	0.04	No	No
R2	182'	-	-	0.004	0.005	0.005	0.3	0.04	No	No
R3	110'	-	-	0.008	0.010	0.010	0.3	0.04	No	No
R4	100'	-	-	0.010	0.011	0.011	0.3	0.04	No	No
R5	100'	-	-	0.010	0.011	0.011	0.3	0.04	No	No
R6	116'	-	-	0.008	0.009	0.009	0.3	0.04	No	No

[1] Receiver locations are shown on Exhibit 8-A.
[2] Based on the Vibration Source Levels of Construction Equipment included on Table 8-11.
[3] Does the peak vibration exceed the vibration thresholds shown on Table 4-2?

Further, the Project-related construction vibration levels do not represent levels capable of causing building damage to nearby residential homes. Caltrans identifies construction vibration levels capable of building damage approaching 0.3 in/sec PPV for older residential structures. (4) The peak, unmitigated Project-construction vibration levels approaching 0.068 in/sec PPV will remain below the Caltrans vibration levels for building damage at the residential homes near the Project site. Moreover, the impacts at the site of the closest sensitive receivers are unlikely to be sustained during the entire construction period, but will occur rather only during the times that heavy construction equipment is operating adjacent to the Project site perimeter.

9 REFERENCES

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11. **Center for Disease Control and Prevention.** About Hearing Loss. [Online] [Cited: 04 15, 2016.] http://www.cdc.gov/healthyschools/noise/signs.htm.
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13. **State of California.** *2016 California Green Building Standards Code.* January 2017.
14. **City of Rancho Cucamonga.** *General Plan Public Health and Safety Element.* May 2010.
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18. **American National Standards Institute (ANSI).** *Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.*
19. **Urban Crossroads, Inc.** *9th Street and Vineyard Avenue Warehouse Air Quality Impact Analysis.* March 2019.

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10 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed 9th Street and Vineyard Avenue Warehouse Project. The information contained in this noise study report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 336-5979.

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EDUCATION

Master of Science in Civil and Environmental Engineering
California Polytechnic State University, San Luis Obispo • December, 1993

Bachelor of Science in City and Regional Planning
California Polytechnic State University, San Luis Obispo • June, 1992

PROFESSIONAL REGISTRATIONS

PE – Registered Professional Traffic Engineer – TR 2537 • January, 2009
AICP – American Institute of Certified Planners – 013011 • June, 1997–January 1, 2012
PTP – Professional Transportation Planner • May, 2007 – May, 2013
INCE – Institute of Noise Control Engineering • March, 2004

PROFESSIONAL AFFILIATIONS

ASA – Acoustical Society of America
ITE – Institute of Transportation Engineers

PROFESSIONAL CERTIFICATIONS

Certified Acoustical Consultant – County of Orange • February, 2011
FHWA-NHI-142051 Highway Traffic Noise Certificate of Training • February, 2013

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APPENDIX 3.1:

CITY OF RANCHO CUCAMONGA MUNICIPAL CODE

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17.66.050 Noise standards.

A. *Purpose*. In order to control unnecessary, excessive, and annoying noise and vibration in the city, it is hereby declared to be the policy of the city to prohibit such noise generated from or by all sources as specified in this section. The provisions apply within all jurisdictions within all zoning districts. Provisions apply based on the designated noise zones:

Noise Zone I: All single- and multiple-family residential properties.

Noise Zone II: All commercial properties.

B. *Decibel measurement criteria*. Any decibel measurement made pursuant to the provisions of this section shall be based on a reference sound pressure of 20 micropascals as measured with a sound level meter using the A-weighted network (scale) at slow response.

C. *Exterior noise standards*.

1. It shall be unlawful for any person at any location within the city to create any noise or allow the creation of any noise on the property owned, leased, occupied, or otherwise controlled by such person, which causes the noise level when measured on the property line of any other property to exceed the basic noise level as adjusted below:

a. Basic noise level for a cumulative period of not more than 15 minutes in any one hour; or

b. Basic noise level plus five dBA for a cumulative period of not more than ten minutes in any one hour; or

c. Basic noise level plus 14 dBA for a cumulative period of not more than five minutes in any one hour; or

d. Basic noise level plus 15 dBA at any time.

2. If the measurement location is a boundary between two different noise zones, the lower noise level standard shall apply.

3. If the intruding noise source is continuous and cannot reasonably be discontinued or stopped for a time period whereby the ambient noise level can be determined, the measured noise level obtained while the noise is in operation shall be compared directly to the allowable noise level standards as specified respective to the measurement's location, designated land use, and for the time of day the noise level is measured. The reasonableness of temporarily discontinuing the noise generation by an intruding noise source shall be determined by the planning director for the purpose of establishing the existing ambient noise level at the measurement location.

D. *Special exclusions*. The following activities shall be exempted from the provisions of this section:

1. City- or school-approved activities conducted on public parks, public playgrounds, and public or private school grounds including, but not limited to, athletic and school entertainment events between the hours of 7:00 a.m. and 10:00 p.m.

2. Occasional outdoor gatherings, dances, shows, and sporting and entertainment events, provided said events are conducted pursuant to the approval of a temporary use permit issued by the city.

3. Any mechanical device, apparatus, or equipment used, related to, or connected with emergency machinery, vehicle, work, or warning alarm or bell, provided the sounding of any bell or alarm on any building or motor vehicle shall terminate its operation within 30 minutes in any hour of its being activated.

4. Noise sources associated with, or vibration created by, construction, repair, remodeling, or grading of any real property or during authorized seismic surveys, provided said activities:

a. When adjacent to a residential land use, school, church or similar type of use, the noise generating activity does not take place between the hours of 8:00 p.m. and 7:00 a.m. on weekdays, including Saturday, or at any time on Sunday or a national holiday, and provided noise levels created do not exceed the noise standard of 65 dBA when measured at the adjacent property line.

b. When adjacent to a commercial or industrial use, the noise generating activity does not take place between the hours of 10:00 p.m. and 6:00 a.m. on weekdays, including Saturday and Sunday, and provided noise levels created do not exceed the noise standards of 70 dBA at the when measured at the adjacent property line.

5. All devices, apparatus, or equipment associated with agricultural operations, provided:

a. Operations do not take place between 8:00 p.m. and 7:00 a.m. on weekdays, including Saturday, or at any time on Sunday or a national holiday.

b. Such operations and equipment are utilized for protection or salvage of agricultural crops during periods of potential or actual frost damage or other adverse weather conditions.

c. Such operations and equipment are associated with agricultural pest control through pesticide application, provided the application is made in accordance with permits issued by, or regulations enforced by, the state department of agriculture.

6. Noise sources associated with the maintenance of real property, provided said activities take place between the hours of 7:00 a.m. and 8:00 p.m. on any day.

7. Any activity to the extent regulation thereof has been preempted by state or federal law.

E. *Schools, churches, libraries, health care institutions*. It shall be unlawful for any person to create any noise which causes the noise level at any school, hospital or similar health care institution, church, or library while the same is in use, to exceed the noise standards specified in this section and prescribed for the assigned noise zone in which the school, hospital, church, or library is located.

F. *Residential noise standards*.

1. Table 17.66.050-1 (Residential Noise Limits) includes the maximum noise limits in residential zones. These are the noise limits when measured at the adjacent residential property line (exterior) or within a neighboring home (interior).

TABLE 17.66.050-1 RESIDENTIAL NOISE LIMITS

Location of Measurement	*Maximum Allowable*	
	10:00 p.m. to 7:00 a.m.	*7:00 a.m. to 10:00 p.m.*
Exterior	60 dBA	65dBA
Interior	45 dBA	50dBA

Additional:

(A) It shall be unlawful for any person at any location within the city to create any noise or to allow the creation of any noise which causes the noise level when measured within any other fully enclosed (windows and doors shut) residential dwelling unit to exceed the interior noise standard in the manner described herein.

(B) If the intruding noise source is continuous and cannot reasonably be discontinued or stopped for a time period whereby the ambient noise level can be determined, each of the noise limits above shall be reduced five dBA for noise consisting of impulse or simple tone noise.

2. *Other residential noise limitations*.

a. *Peddlers; use of loud noise, etc., to advertise goods, etc*. No peddler or mobile vendor or any person in their behalf shall shout, cry out, or use any device or instrument to make sounds for the purpose of advertising in such a manner as to create a noise disturbance.

b. *Animal noises*. No person owning or having the charge, care, custody, or control of any dog or other animal or fowl shall allow or permit the same to habitually howl, bark, yelp, or make other noises, in such a manner as to create a noise disturbance.

c. *Radios, television sets, musical instruments, and similar devices*. No person shall operate or permit the operation or playing of any device which reproduces, produces, or amplifies sound, such as a radio, musical instrument, phonograph, or sound amplifier, in such a manner as to create a noise disturbance.

i. Across any real property boundary or within Noise Zone I, between the hours of 10:00 p.m. and 7:00 a.m. on the following day (except for activities for which a temporary use permit has been issued).

ii. At 50 feet from any such device, if operated on or over any public right-of-way.

G. *Commercial and office noise provisions*. All operations and businesses shall be conducted to comply with the following standards:

1. All commercial and office activities shall not create any noise that would exceed an exterior noise level of 65 dBA during the hours of 10:00 p.m. to 7:00 a.m. and 70 dBA during the hours of 7:00 a.m. to 10:00 p.m. when measured at the adjacent property line.

2. *Loading and unloading*. No person shall cause the loading, unloading, opening, closing, or other handling of boxes, crates, containers, building materials, garbage cans, or similar objects between the hours of 10:00 p.m. and 7:00 a.m., in a manner which would cause a noise disturbance to a residential area.

3. *Vehicle repairs and testing*. No person shall cause or permit the repairing, rebuilding, modifying, or testing of any motor vehicle, motorcycle, or motorboat in such a manner as to increase a noise disturbance between the hours of 10:00 p.m. and 8:00 a.m. adjacent to a residential area.

H. Industrial noise provision included in Table 17.66.110-1 (Industrial Performance Standards). (Code 1980, § 17.66.050; Ord. No. 855 § 4, 2012)

17.66.070 Vibration.

Uses that generate vibrations that may be considered a public nuisance or hazard on any adjacent property shall be cushioned or isolated to prevent generation of vibrations. Uses shall be operated in compliance with the following provisions:

A. No vibration shall be produced that is transmitted through the ground and is discernible without the aid of instruments at the points of measurement specified in section 17.66.030 (Points of Measurement) of this chapter, nor shall any vibration produced exceed 0.002g peak at up to 50 CPS frequency, measured at the point of measurement specified in section 17.66.030 (Points of Measurement) of this chapter using either seismic or electronic vibration measuring equipment. Vibrations occurring at higher than 50 CPS frequency of a periodic vibration shall not induce accelerations exceeding 0.001g. Single-impulse periodic vibrations occurring at an average interval greater than five minutes shall not induce accelerations exceeding 0.01g.

B. Uses, activities, and processes shall not generate vibrations that cause discomfort or annoyance to reasonable persons of normal sensitivity or which endangers the comfort, repose, health, or peace of residents whose property abuts the property line of the parcel.

C. Uses shall not generate ground vibration that interferes with the operations of equipment and facilities of adjoining parcels.

D. Vibrations from temporary construction/demolition and vehicles that leave the subject parcel (e.g., trucks, trains, and aircraft) are exempt from the provisions of this section. (Code 1980, § 17.66.070; Ord. No. 855 § 4, 2012)

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17.66.110 Special industrial performance standards.

A. *Purpose*. The performance standards allow industrial uses to operate consistent with the overall characteristics of the land use category to provide for a healthy, safe, and pleasing environment in keeping with the nature and level of surrounding industrial activity. The performance standards contained in Table 17.66.110-1 (Industrial Performance Standards) are applied based on the zoning district as follows:

1. *Industrial Park (IP) Zoning District; Class A performance standards*. The most restrictive of the performance standards to ensure a high quality working environment and available sites for industrial and business firms whose functional and economic needs require protection from the adverse affects of noise, odors, vibration, glare, or high-intensity illumination, and other nuisances.

2. *General Industrial (GI) Zoning District; Class B performance standards*. These standards are intended to provide for the broadest range of industrial activity while assuring a basic level environmental protection. It is the intent of the standards of this section to provide for uses whose operational needs may produce noise, vibration, particulate matter and air contaminants, odors, or humidity, heat, and glare which cannot be mitigated sufficiently to meet the Class A standards. The standards are so designed to protect uses on adjoining sites from effects which could adversely affect their functional and economic viability.

3. *Medium Impact/High Impact (MI/HI) and Heavy Industrial (HI) Zoning Districts; Class C performance standards*. It is the intent of the standards of this section to make allowances for industrial uses whose associated processes produce noise, particulate matter and air contaminants, vibration, odor, humidity, heat, glare, or high-intensity illumination which would adversely affect the functional and economic viability of other uses. The standards, when combined with standards imposed by other governmental agencies, serve to provide basic health and safety protection for persons employed within or visiting the area.

TABLE 17.66.110-1 INDUSTRIAL PERFORMANCE STANDARDS

Class A	Class B	Class C
Noise Maximum		
• 70dB (anywhere on lot) • 65 dB (interior space of neighboring use on same lot) • Noise caused by motor vehicles is exempted from this standard.	• 80 dB (anywhere on lot) • 65dB (at residential property line) • Noise caused by motor vehicles and trains is exempted from this standard.	• 85 dB (lot line) • 65dB (at residential property line) • Where a use occupies a lot abutting or separated by a street from a lot within the designated Class A or B performance standard or residential property, the performance standard of the abutting property shall apply at the common or facing lot line.
Vibration		
All uses shall be so operated as not to generate vibration discernible without instruments by the average person while on or beyond the lot upon which the source is located or within an adjoining enclosed space if more than one establishment occupies a structure. Vibration caused by motor vehicles, trains, and temporary construction or demolition work is exempted from this standard.	All uses shall be operated so as not to generate vibration discernible without instruments by the average persons beyond the lot upon which the source is located. Vibration caused by motor vehicles, trains, and temporary construction or demolition is exempted from this standard.	All uses shall be operated so as not to generate vibration discernible without instruments by the average person beyond 600 feet from where the source is located. Vibration caused by motor vehicles, trains, and temporary construction and demolition is exempted from this standard.
Particulate Matter and Air Contaminants		
In addition to compliance with the Air Quality Maintenance District (AQMD) standards, all uses shall be operated so as not to emit particulate matter or air contaminants that are readily detectable without instruments by the average person while on the lot containing such uses.	In addition to compliance with the AQMD standards, all uses shall be operated so as not to emit particulate matter or air contaminants that are readily detectable without instruments by the average person beyond any lot line of the lot containing such uses.	In addition to compliance with the AQMD standards, all uses shall be operated so as not to emit particulate matter or air contaminants that (a) are injurious to the health of either persons engaged in or related to the use of the lot, or persons residing, working, visiting, or recreating in neighboring areas; (b) substantially and adversely affect the maintenance of property in nearby areas; (c) are disruptive of industrial processes carried on in other parts of the industrial area. Where a use occupies a lot abutting or separated by a street lot with designated Class A or B, the A or B performance standard for particulate matter and air contaminants shall apply at the common or facing lot line.
Odor		
All uses shall be operated so as not to emit matter causing unpleasant odors that are perceptible to the average person while within or beyond the lot containing such uses.	All uses shall be operated so as not to emit matter causing unpleasant odors that are perceptible to the average person beyond any lot line of the lot containing such uses.	All uses shall be operated so as not to emit matter causing unpleasant odors that are perceptible to the average person beyond any lot line of the lot containing such uses.
Humidity, Heat, and Glare		
All uses shall be operated so as not to produce humidity, heat, glare, or high-intensity illumination that is perceptible without instruments by the average person while on or beyond the lot containing such use.	All uses shall be operated so as not to produce humidity, heat, glare, or high-intensity illumination that is perceptible without instruments by the average person beyond the lot line of any lot containing such use.	All uses shall be operated so as not to produce humidity, heat, glare, or high-intensity illumination that is perceptible without instruments by the average person while on any lot zoned for residential purposes or any industrial property with a Class A or B performance standard designation.

(Code 1980, § 17.66.110; Ord. No. 855 § 4, 2012)

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APPENDIX 5.1:

STUDY AREA PHOTOS

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JN:12377 Study Area Photos

L1 East

L1 North

L1 South

L1 West

L2 East

L2 North

JN:12377 Study Area Photos

L2 Northeast

L2 Southwest

L3 East

L3 North

L3 West

L4 East

JN:12377 Study Area Photos

L4 North

L4 Northeast

L4 West

L5 East

L5 Northwest

L5 South

JN:12377 Study Area Photos

L5 West

L6 East

L6 North

L6 South

L6 West

APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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24-Hour Noise Level Measurement Summary

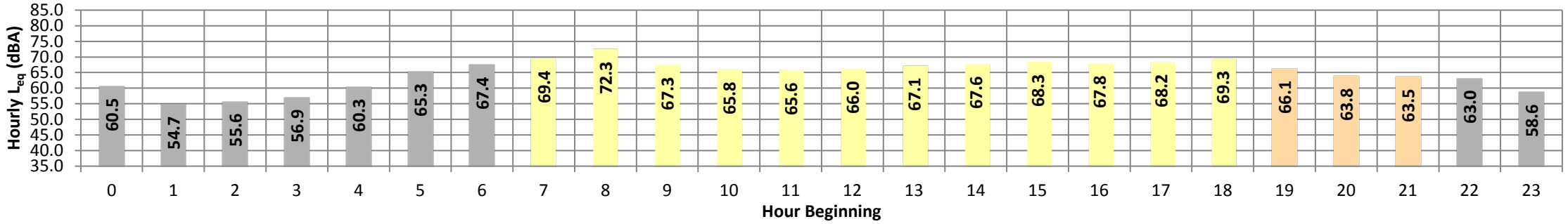
Date: Tuesday, March 19, 2019
Project: 9th/Vineyard

Location: L1 - Located north of the Project site near existing residential homes on the north side of Arrow Route.

Meter: Piccolo I

JN: 12377
Analyst: A.Wolfe

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	60.5	86.9	44.4	69.0	67.0	64.0	62.0	52.0	48.0	46.0	45.0	45.0	60.5	10.0	70.5
	1	54.7	75.7	44.9	66.0	65.0	61.0	58.0	49.0	47.0	45.0	45.0	45.0	54.7	10.0	64.7
	2	55.6	75.0	45.2	67.0	66.0	61.0	58.0	50.0	48.0	46.0	46.0	46.0	55.6	10.0	65.6
	3	56.9	76.3	44.3	68.0	66.0	64.0	61.0	50.0	48.0	46.0	45.0	45.0	56.9	10.0	66.9
	4	60.3	76.8	46.1	71.0	69.0	67.0	65.0	58.0	52.0	49.0	48.0	46.0	60.3	10.0	70.3
	5	65.3	88.2	46.3	74.0	72.0	70.0	68.0	64.0	58.0	48.0	47.0	47.0	65.3	10.0	75.3
	6	67.4	87.7	49.5	76.0	74.0	72.0	71.0	67.0	62.0	53.0	52.0	50.0	67.4	10.0	77.4
Day	7	69.4	87.9	51.9	77.0	76.0	74.0	73.0	70.0	66.0	58.0	55.0	52.0	69.4	0.0	69.4
	8	72.3	93.8	46.2	84.0	80.0	75.0	73.0	69.0	65.0	55.0	52.0	48.0	72.3	0.0	72.3
	9	67.3	89.9	43.6	76.0	73.0	71.0	70.0	67.0	63.0	51.0	48.0	44.0	67.3	0.0	67.3
	10	65.8	82.6	44.4	73.0	72.0	71.0	70.0	66.0	63.0	51.0	49.0	47.0	65.8	0.0	65.8
	11	65.6	84.1	42.6	74.0	73.0	71.0	70.0	66.0	61.0	49.0	46.0	44.0	65.6	0.0	65.6
	12	66.0	82.9	41.4	75.0	72.0	71.0	70.0	66.0	62.0	49.0	47.0	44.0	66.0	0.0	66.0
	13	67.1	92.2	42.6	75.0	73.0	71.0	70.0	67.0	62.0	51.0	48.0	44.0	67.1	0.0	67.1
	14	67.6	91.3	43.9	76.0	74.0	72.0	71.0	67.0	63.0	52.0	48.0	45.0	67.6	0.0	67.6
	15	68.3	92.2	46.6	76.0	74.0	72.0	71.0	68.0	65.0	55.0	52.0	48.0	68.3	0.0	68.3
	16	67.8	90.2	45.9	75.0	73.0	72.0	71.0	68.0	64.0	53.0	51.0	48.0	67.8	0.0	67.8
	17	68.2	85.8	47.4	76.0	74.0	72.0	71.0	69.0	66.0	57.0	54.0	49.0	68.2	0.0	68.2
	18	69.3	98.1	47.6	75.0	73.0	71.0	70.0	67.0	64.0	54.0	51.0	49.0	69.3	0.0	69.3
Evening	19	66.1	89.2	44.7	74.0	73.0	70.0	69.0	66.0	62.0	50.0	48.0	46.0	66.1	5.0	71.1
	20	63.8	80.8	43.7	72.0	71.0	69.0	68.0	65.0	60.0	48.0	46.0	45.0	63.8	5.0	68.8
	21	63.5	85.4	41.8	73.0	71.0	69.0	68.0	63.0	57.0	46.0	44.0	43.0	63.5	5.0	68.5
Night	22	63.0	90.5	42.5	72.0	70.0	67.0	66.0	60.0	52.0	44.0	44.0	43.0	63.0	10.0	73.0
	23	58.6	79.8	42.3	69.0	67.0	65.0	63.0	56.0	47.0	44.0	43.0	42.0	58.6	10.0	68.6

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	65.6	82.6	41.4	73.0	72.0	71.0	70.0	66.0	61.0	49.0	46.0	44.0
	Max	72.3	98.1	51.9	84.0	80.0	75.0	73.0	70.0	66.0	58.0	55.0	52.0
Energy Average		68.3	Average:		76.0	73.9	71.9	70.8	67.5	63.7	52.9	50.1	46.8
Evening	Min	63.5	80.8	41.8	72.0	71.0	69.0	68.0	63.0	57.0	46.0	44.0	43.0
	Max	66.1	89.2	44.7	74.0	73.0	70.0	69.0	66.0	62.0	50.0	48.0	46.0
Energy Average		64.6	Average:		73.0	71.7	69.3	68.3	64.7	59.7	48.0	46.0	44.7
Night	Min	54.7	75.0	42.3	66.0	65.0	61.0	58.0	49.0	47.0	44.0	43.0	42.0
	Max	67.4	90.5	49.5	76.0	74.0	72.0	71.0	67.0	62.0	53.0	52.0	50.0
Energy Average		62.2	Average:		70.2	68.4	65.7	63.6	56.2	51.3	46.8	46.1	45.4

L_{eq} (dBA)

24-Hour	*Daytime*	*Nighttime*
66.4	**67.8**	**62.2**

24-Hour CNEL (dBA)

70.3

24-Hour Noise Level Measurement Summary

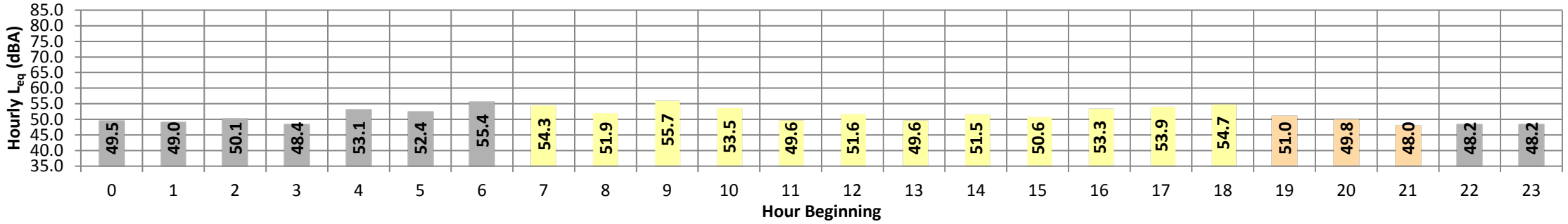
Date: Tuesday, March 19, 2019
Project: 9th/Vineyard

Location: L2 - Located east of the Project site, west of Vineyard Avenue near existing commercial and office uses.

Meter: Piccolo I

JN: 12377
Analyst: A.Wolfe

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	49.5	64.2	46.1	57.0	55.0	52.0	51.0	48.0	48.0	47.0	46.0	46.0	49.5	10.0	59.5
	1	49.0	62.0	46.5	55.0	53.0	51.0	50.0	48.0	48.0	47.0	47.0	47.0	49.0	10.0	59.0
	2	50.1	67.8	44.7	58.0	56.0	53.0	52.0	49.0	48.0	46.0	46.0	45.0	50.1	10.0	60.1
	3	48.4	63.4	44.8	54.0	52.0	50.0	50.0	48.0	47.0	46.0	46.0	45.0	48.4	10.0	58.4
	4	53.1	78.7	46.1	60.0	57.0	54.0	53.0	51.0	50.0	49.0	47.0	46.0	53.1	10.0	63.1
	5	52.4	67.3	48.3	59.0	57.0	55.0	54.0	52.0	51.0	49.0	49.0	48.0	52.4	10.0	62.4
	6	55.4	68.6	49.9	62.0	60.0	59.0	58.0	55.0	54.0	51.0	51.0	50.0	55.4	10.0	65.4
Day	7	54.3	76.4	49.7	61.0	59.0	56.0	55.0	53.0	52.0	51.0	51.0	50.0	54.3	0.0	54.3
	8	51.9	72.1	44.6	58.0	57.0	55.0	54.0	51.0	50.0	47.0	46.0	45.0	51.9	0.0	51.9
	9	55.7	85.0	43.7	64.0	59.0	53.0	52.0	49.0	47.0	45.0	45.0	44.0	55.7	0.0	55.7
	10	53.5	71.5	43.8	64.0	61.0	57.0	56.0	52.0	49.0	46.0	45.0	44.0	53.5	0.0	53.5
	11	49.6	67.6	44.0	57.0	55.0	53.0	51.0	49.0	48.0	46.0	45.0	44.0	49.6	0.0	49.6
	12	51.6	75.9	43.5	60.0	57.0	54.0	53.0	49.0	48.0	46.0	45.0	44.0	51.6	0.0	51.6
	13	49.6	71.9	42.1	58.0	54.0	52.0	51.0	48.0	47.0	45.0	44.0	43.0	49.6	0.0	49.6
	14	51.5	77.0	43.3	59.0	56.0	53.0	52.0	49.0	47.0	45.0	45.0	44.0	51.5	0.0	51.5
	15	50.6	74.3	43.8	59.0	56.0	52.0	51.0	49.0	47.0	46.0	45.0	45.0	50.6	0.0	50.6
	16	53.3	78.0	44.2	63.0	58.0	53.0	52.0	49.0	48.0	46.0	45.0	45.0	53.3	0.0	53.3
	17	53.9	75.7	46.3	64.0	61.0	57.0	56.0	51.0	50.0	48.0	47.0	47.0	53.9	0.0	53.9
	18	54.7	76.9	45.3	67.0	62.0	58.0	56.0	51.0	49.0	47.0	46.0	46.0	54.7	0.0	54.7
Evening	19	51.0	73.0	45.3	61.0	58.0	54.0	52.0	49.0	48.0	46.0	46.0	46.0	51.0	5.0	56.0
	20	49.8	71.8	44.8	58.0	55.0	52.0	50.0	48.0	47.0	46.0	46.0	45.0	49.8	5.0	54.8
	21	48.0	69.0	43.1	54.0	52.0	50.0	49.0	48.0	46.0	44.0	44.0	43.0	48.0	5.0	53.0
Night	22	48.2	64.2	43.2	56.0	54.0	51.0	50.0	48.0	46.0	44.0	44.0	44.0	48.2	10.0	58.2
	23	48.2	62.7	44.6	56.0	54.0	51.0	50.0	47.0	46.0	45.0	45.0	45.0	48.2	10.0	58.2

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	49.6	67.6	42.1	57.0	54.0	52.0	51.0	48.0	47.0	45.0	44.0	43.0
	Max	55.7	85.0	49.7	67.0	62.0	58.0	56.0	53.0	52.0	51.0	51.0	50.0
Energy Average		52.9	Average:		61.2	57.9	54.4	53.3	50.0	48.5	46.5	45.8	45.1
Evening	Min	48.0	69.0	43.1	54.0	52.0	50.0	49.0	48.0	46.0	44.0	44.0	43.0
	Max	51.0	73.0	45.3	61.0	58.0	54.0	52.0	49.0	48.0	46.0	46.0	46.0
Energy Average		49.8	Average:		57.7	55.0	52.0	50.3	48.3	47.0	45.3	45.3	44.7
Night	Min	48.2	62.0	43.2	54.0	52.0	50.0	50.0	47.0	46.0	44.0	44.0	44.0
	Max	55.4	78.7	49.9	62.0	60.0	59.0	58.0	55.0	54.0	51.0	51.0	50.0
Energy Average		51.2	Average:		57.4	55.3	52.9	52.0	49.6	48.7	47.1	46.8	46.2

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
52.0	52.5	51.2

24-Hour CNEL (dBA)
58.0

24-Hour Noise Level Measurement Summary

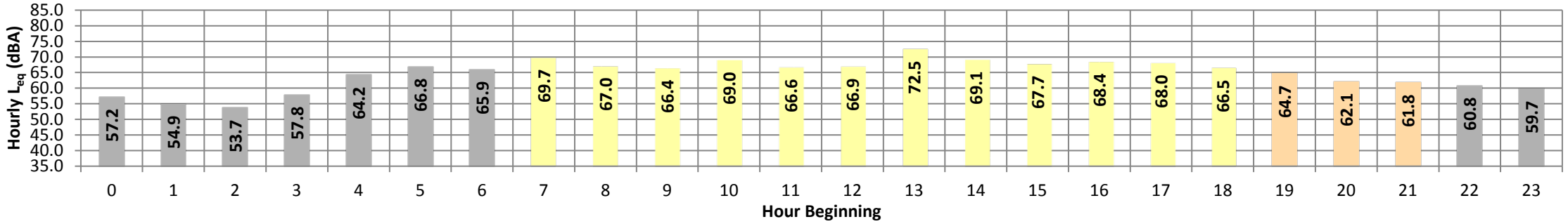
Date: Tuesday, March 19, 2019
Project: 9th/Vineyard

Location: L3 - Located south of the Project site near existing commercial uses on the south side of 9th Street.

Meter: Piccolo I

JN: 12377
Analyst: A.Wolfe

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	57.2	82.3	52.0	68.0	63.0	58.0	56.0	54.0	53.0	52.0	52.0	52.0	57.2	10.0	67.2
	1	54.9	74.0	49.6	65.0	60.0	55.0	54.0	53.0	53.0	50.0	50.0	50.0	54.9	10.0	64.9
	2	53.7	77.4	48.0	63.0	57.0	54.0	53.0	51.0	50.0	49.0	48.0	48.0	53.7	10.0	63.7
	3	57.8	80.5	48.1	71.0	66.0	57.0	54.0	52.0	51.0	49.0	49.0	48.0	57.8	10.0	67.8
	4	64.2	88.9	49.6	75.0	73.0	69.0	67.0	59.0	55.0	52.0	50.0	50.0	64.2	10.0	74.2
	5	66.8	89.7	53.0	79.0	77.0	72.0	69.0	61.0	57.0	55.0	54.0	53.0	66.8	10.0	76.8
	6	65.9	83.1	52.5	77.0	75.0	72.0	71.0	63.0	58.0	55.0	54.0	53.0	65.9	10.0	75.9
Day	7	69.7	84.4	52.4	78.0	77.0	75.0	74.0	70.0	63.0	54.0	53.0	53.0	69.7	0.0	69.7
	8	67.0	82.5	45.5	77.0	76.0	74.0	72.0	66.0	56.0	50.0	48.0	46.0	67.0	0.0	67.0
	9	66.4	83.4	45.3	76.0	75.0	73.0	71.0	65.0	56.0	49.0	48.0	46.0	66.4	0.0	66.4
	10	69.0	95.9	44.3	77.0	76.0	73.0	72.0	65.0	58.0	48.0	47.0	45.0	69.0	0.0	69.0
	11	66.6	91.3	43.4	76.0	75.0	73.0	71.0	64.0	54.0	48.0	46.0	45.0	66.6	0.0	66.6
	12	66.9	83.0	44.8	77.0	75.0	73.0	72.0	66.0	59.0	50.0	48.0	46.0	66.9	0.0	66.9
	13	72.5	103.7	48.1	77.0	75.0	73.0	71.0	65.0	57.0	50.0	50.0	49.0	72.5	0.0	72.5
	14	69.1	93.6	46.7	77.0	76.0	74.0	73.0	69.0	62.0	52.0	50.0	48.0	69.1	0.0	69.1
	15	67.7	84.3	49.8	77.0	76.0	74.0	73.0	68.0	60.0	52.0	51.0	50.0	67.7	0.0	67.7
	16	68.4	86.5	48.6	77.0	76.0	74.0	73.0	68.0	61.0	52.0	51.0	50.0	68.4	0.0	68.4
	17	68.0	86.2	48.1	77.0	76.0	74.0	73.0	68.0	61.0	53.0	52.0	49.0	68.0	0.0	68.0
	18	66.5	84.5	46.3	76.0	75.0	73.0	72.0	65.0	57.0	49.0	48.0	47.0	66.5	0.0	66.5
Evening	19	64.7	81.6	46.4	76.0	74.0	71.0	70.0	61.0	52.0	48.0	47.0	47.0	64.7	5.0	69.7
	20	62.1	79.3	45.3	74.0	72.0	69.0	67.0	57.0	50.0	47.0	46.0	45.0	62.1	5.0	67.1
	21	61.8	82.1	43.4	74.0	72.0	68.0	66.0	54.0	51.0	45.0	45.0	44.0	61.8	5.0	66.8
Night	22	60.8	82.1	44.3	73.0	71.0	67.0	64.0	53.0	48.0	46.0	45.0	45.0	60.8	10.0	70.8
	23	59.7	86.3	50.8	70.0	68.0	62.0	58.0	53.0	52.0	52.0	51.0	51.0	59.7	10.0	69.7

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	66.4	82.5	43.4	76.0	75.0	73.0	71.0	64.0	54.0	48.0	46.0	45.0
	Max	72.5	103.7	52.4	78.0	77.0	75.0	74.0	70.0	63.0	54.0	53.0	53.0
Energy Average		68.5	Average:		76.8	75.7	73.6	72.3	66.6	58.7	50.6	49.3	47.8
Evening	Min	61.8	79.3	43.4	74.0	72.0	68.0	66.0	54.0	50.0	45.0	45.0	44.0
	Max	64.7	82.1	46.4	76.0	74.0	71.0	70.0	61.0	52.0	48.0	47.0	47.0
Energy Average		63.1	Average:		74.7	72.7	69.3	67.7	57.3	51.0	46.7	46.0	45.3
Night	Min	53.7	74.0	44.3	63.0	57.0	54.0	53.0	51.0	48.0	46.0	45.0	45.0
	Max	66.8	89.7	53.0	79.0	77.0	72.0	71.0	63.0	58.0	55.0	54.0	53.0
Energy Average		62.3	Average:		71.2	67.8	62.9	60.7	55.4	53.0	51.1	50.3	50.0

L_{eq} (dBA)

24-Hour	*Daytime*	*Nighttime*
66.5	**67.9**	**62.3**

24-Hour CNEL (dBA)

70.3

24-Hour Noise Level Measurement Summary

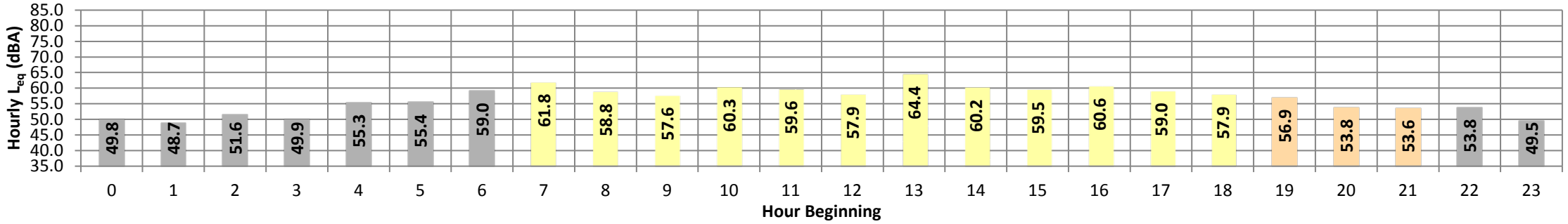
Date: Tuesday, March 19, 2019
Project: 9th/Vineyard

Location: L4 - Located west of the Project site on the north side of 9th Street near existing residential homes.

Meter: Piccolo I

JN: 12377
Analyst: A.Wolfe

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	49.8	71.9	43.5	60.0	57.0	53.0	51.0	47.0	46.0	44.0	44.0	44.0	49.8	10.0	59.8
	1	48.7	63.4	44.5	57.0	56.0	53.0	50.0	47.0	46.0	45.0	45.0	45.0	48.7	10.0	58.7
	2	51.6	67.4	44.4	61.0	59.0	57.0	55.0	50.0	47.0	46.0	46.0	45.0	51.6	10.0	61.6
	3	49.9	68.5	44.4	61.0	56.0	52.0	50.0	48.0	47.0	45.0	45.0	45.0	49.9	10.0	59.9
	4	55.3	76.8	45.7	66.0	64.0	60.0	57.0	51.0	50.0	47.0	47.0	46.0	55.3	10.0	65.3
	5	55.4	72.5	48.8	65.0	63.0	61.0	59.0	53.0	51.0	50.0	49.0	49.0	55.4	10.0	65.4
	6	59.0	78.9	50.5	68.0	66.0	63.0	62.0	57.0	55.0	52.0	51.0	51.0	59.0	10.0	69.0
Day	7	61.8	83.0	50.1	69.0	68.0	66.0	65.0	61.0	57.0	52.0	51.0	50.0	61.8	0.0	61.8
	8	58.8	79.9	45.0	69.0	67.0	64.0	62.0	58.0	52.0	48.0	47.0	46.0	58.8	0.0	58.8
	9	57.6	76.3	43.0	67.0	66.0	63.0	62.0	56.0	51.0	46.0	45.0	44.0	57.6	0.0	57.6
	10	60.3	80.9	44.4	70.0	67.0	64.0	63.0	58.0	53.0	47.0	46.0	45.0	60.3	0.0	60.3
	11	59.6	87.8	41.2	70.0	67.0	63.0	62.0	56.0	48.0	43.0	43.0	42.0	59.6	0.0	59.6
	12	57.9	81.0	41.8	68.0	66.0	63.0	61.0	56.0	50.0	44.0	43.0	42.0	57.9	0.0	57.9
	13	64.4	96.5	41.1	67.0	65.0	62.0	61.0	56.0	49.0	44.0	43.0	42.0	64.4	0.0	64.4
	14	60.2	84.5	41.1	70.0	67.0	64.0	63.0	59.0	53.0	46.0	45.0	43.0	60.2	0.0	60.2
	15	59.5	83.8	43.8	69.0	67.0	64.0	62.0	58.0	52.0	46.0	45.0	44.0	59.5	0.0	59.5
	16	60.6	85.2	43.7	70.0	68.0	65.0	63.0	59.0	53.0	46.0	46.0	45.0	60.6	0.0	60.6
	17	59.0	76.4	45.9	68.0	66.0	64.0	63.0	59.0	54.0	48.0	48.0	47.0	59.0	0.0	59.0
	18	57.9	76.0	43.9	68.0	66.0	63.0	62.0	57.0	51.0	46.0	45.0	44.0	57.9	0.0	57.9
Evening	19	56.9	79.3	43.3	68.0	65.0	62.0	60.0	54.0	48.0	45.0	45.0	44.0	56.9	5.0	61.9
	20	53.8	77.6	42.3	64.0	62.0	59.0	57.0	50.0	46.0	44.0	44.0	43.0	53.8	5.0	58.8
	21	53.6	81.3	40.6	63.0	62.0	59.0	56.0	47.0	44.0	42.0	41.0	41.0	53.6	5.0	58.6
Night	22	53.8	78.8	41.0	64.0	62.0	59.0	56.0	48.0	45.0	42.0	42.0	41.0	53.8	10.0	63.8
	23	49.5	70.8	40.2	60.0	59.0	55.0	52.0	45.0	43.0	42.0	42.0	41.0	49.5	10.0	59.5

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	57.6	76.0	41.1	67.0	65.0	62.0	61.0	56.0	48.0	43.0	43.0	42.0
	Max	64.4	96.5	50.1	70.0	68.0	66.0	65.0	61.0	57.0	52.0	51.0	50.0
Energy Average		60.2	Average:		68.8	66.7	63.8	62.4	57.8	51.9	46.3	45.6	44.5
Evening	Min	53.6	77.6	40.6	63.0	62.0	59.0	56.0	47.0	44.0	42.0	41.0	41.0
	Max	56.9	81.3	43.3	68.0	65.0	62.0	60.0	54.0	48.0	45.0	45.0	44.0
Energy Average		55.0	Average:		65.0	63.0	60.0	57.7	50.3	46.0	43.7	43.3	42.7
Night	Min	48.7	63.4	40.2	57.0	56.0	52.0	50.0	45.0	43.0	42.0	42.0	41.0
	Max	59.0	78.9	50.5	68.0	66.0	63.0	62.0	57.0	55.0	52.0	51.0	51.0
Energy Average		53.9	Average:		62.4	60.2	57.0	54.7	49.6	47.8	45.9	45.7	45.2

L_{eq} (dBA)		
24-Hour	Daytime	Nighttime
58.2	59.6	53.9

24-Hour CNEL (dBA)
62.0

24-Hour Noise Level Measurement Summary

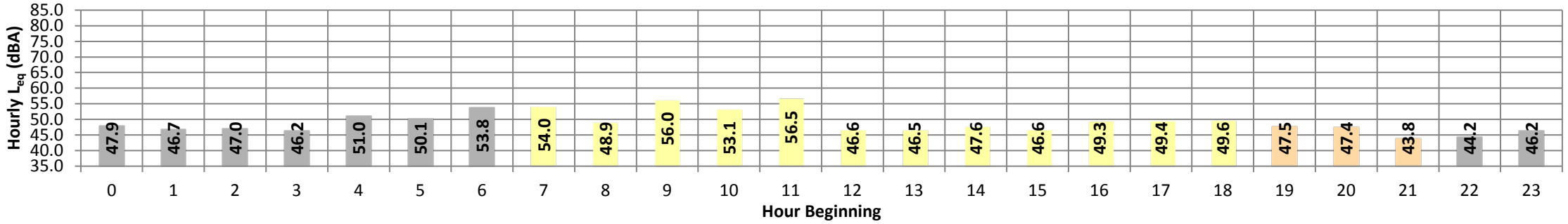
Date: Tuesday, March 19, 2019
Project: 9th/Vineyard

Location: L5 - Located adjacent to the northwestern portion of the Project site within an existing residential community south of Arrow Route.

Meter: Piccolo I

JN: 12377
Analyst: A.Wolfe

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	47.9	62.1	45.0	57.0	53.0	49.0	48.0	47.0	46.0	45.0	45.0	45.0	47.9	10.0	57.9
	1	46.7	59.4	43.7	51.0	50.0	48.0	47.0	46.0	46.0	45.0	45.0	44.0	46.7	10.0	56.7
	2	47.0	58.9	42.1	53.0	51.0	50.0	49.0	47.0	46.0	43.0	43.0	43.0	47.0	10.0	57.0
	3	46.2	52.8	42.9	50.0	49.0	48.0	48.0	46.0	45.0	44.0	43.0	43.0	46.2	10.0	56.2
	4	51.0	73.0	45.4	58.0	55.0	53.0	52.0	50.0	49.0	47.0	46.0	45.0	51.0	10.0	61.0
	5	50.1	66.6	46.5	55.0	53.0	51.0	51.0	50.0	49.0	47.0	47.0	47.0	50.1	10.0	60.1
	6	53.8	72.9	47.5	62.0	60.0	56.0	55.0	53.0	51.0	49.0	49.0	48.0	53.8	10.0	63.8
Day	7	54.0	78.6	47.2	63.0	60.0	56.0	54.0	51.0	50.0	49.0	48.0	47.0	54.0	0.0	54.0
	8	48.9	65.9	41.8	57.0	55.0	52.0	51.0	48.0	47.0	44.0	43.0	42.0	48.9	0.0	48.9
	9	56.0	74.8	40.5	71.0	69.0	54.0	51.0	46.0	44.0	42.0	42.0	41.0	56.0	0.0	56.0
	10	53.1	76.2	40.8	66.0	63.0	56.0	54.0	49.0	45.0	42.0	42.0	41.0	53.1	0.0	53.1
	11	56.5	75.3	40.7	67.0	67.0	66.0	55.0	46.0	44.0	42.0	41.0	40.0	56.5	0.0	56.5
	12	46.6	66.3	39.0	56.0	54.0	51.0	49.0	45.0	43.0	40.0	40.0	40.0	46.6	0.0	46.6
	13	46.5	67.9	38.6	57.0	54.0	50.0	48.0	44.0	42.0	40.0	39.0	39.0	46.5	0.0	46.5
	14	47.6	68.5	39.0	58.0	56.0	53.0	50.0	45.0	43.0	40.0	39.0	39.0	47.6	0.0	47.6
	15	46.6	64.7	40.4	55.0	53.0	50.0	49.0	46.0	44.0	42.0	42.0	41.0	46.6	0.0	46.6
	16	49.3	74.2	41.9	58.0	57.0	54.0	52.0	46.0	44.0	43.0	42.0	42.0	49.3	0.0	49.3
	17	49.4	68.9	42.9	59.0	57.0	54.0	52.0	47.0	46.0	44.0	43.0	43.0	49.4	0.0	49.4
	18	49.6	66.0	42.0	61.0	58.0	55.0	53.0	47.0	45.0	43.0	43.0	42.0	49.6	0.0	49.6
Evening	19	47.5	67.3	42.0	58.0	54.0	50.0	49.0	45.0	44.0	43.0	43.0	42.0	47.5	5.0	52.5
	20	47.4	68.9	41.9	56.0	54.0	50.0	48.0	45.0	43.0	42.0	42.0	42.0	47.4	5.0	52.4
	21	43.8	61.3	40.4	52.0	49.0	46.0	45.0	43.0	42.0	40.0	40.0	40.0	43.8	5.0	48.8
Night	22	44.2	65.6	39.0	52.0	51.0	48.0	46.0	43.0	42.0	40.0	39.0	39.0	44.2	10.0	54.2
	23	46.2	58.8	42.9	54.0	52.0	48.0	47.0	45.0	44.0	43.0	43.0	43.0	46.2	10.0	56.2

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	46.5	64.7	38.6	55.0	53.0	50.0	48.0	44.0	42.0	40.0	39.0	39.0
	Max	56.5	78.6	47.2	71.0	69.0	66.0	55.0	51.0	50.0	49.0	48.0	47.0
Energy Average		51.8	Average:		60.7	58.6	54.3	51.5	46.7	44.8	42.6	42.0	41.4
Evening	Min	43.8	61.3	40.4	52.0	49.0	46.0	45.0	43.0	42.0	40.0	40.0	40.0
	Max	47.5	68.9	42.0	58.0	54.0	50.0	49.0	45.0	44.0	43.0	43.0	42.0
Energy Average		46.5	Average:		55.3	52.3	48.7	47.3	44.3	43.0	41.7	41.7	41.3
Night	Min	44.2	52.8	39.0	50.0	49.0	48.0	46.0	43.0	42.0	40.0	39.0	39.0
	Max	53.8	73.0	47.5	62.0	60.0	56.0	55.0	53.0	51.0	49.0	49.0	48.0
Energy Average		49.1	Average:		54.7	52.7	50.1	49.2	47.4	46.4	44.8	44.4	44.1

L_{eq} (dBA)

24-Hour	Daytime	Nighttime
50.5	**51.2**	**49.1**

24-Hour CNEL (dBA)

56.0

24-Hour Noise Level Measurement Summary

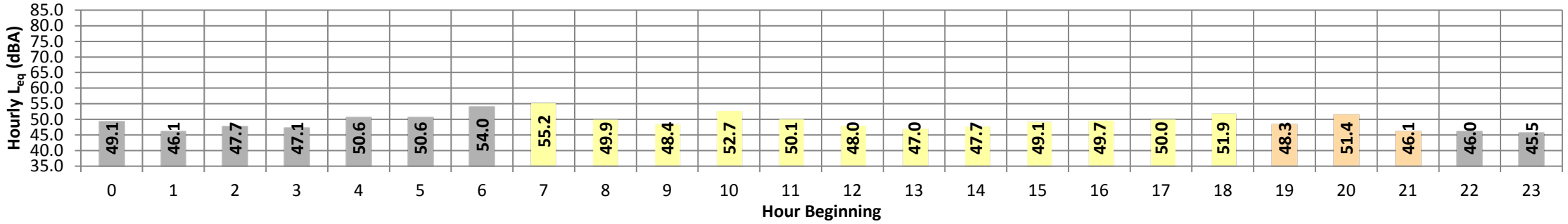
Date: Tuesday, March 19, 2019
Project: 9th/Vineyard

Location: L6 - Located adjacent to the northwestern corner of the Project site boundaries in an existing residential community south of Arrow Route.

Meter: Piccolo I

JN: 12377
Analyst: A.Wolfe

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	49.1	67.4	44.0	58.0	53.0	52.0	52.0	49.0	46.0	44.0	44.0	44.0	49.1	10.0	59.1
	1	46.1	63.1	43.4	51.0	50.0	48.0	47.0	45.0	45.0	44.0	44.0	43.0	46.1	10.0	56.1
	2	47.7	63.3	43.5	55.0	53.0	51.0	50.0	47.0	46.0	44.0	44.0	44.0	47.7	10.0	57.7
	3	47.1	68.9	42.7	51.0	50.0	49.0	48.0	46.0	46.0	44.0	44.0	43.0	47.1	10.0	57.1
	4	50.6	70.1	44.7	57.0	54.0	52.0	52.0	50.0	49.0	46.0	46.0	45.0	50.6	10.0	60.6
	5	50.6	69.8	45.5	58.0	56.0	53.0	52.0	50.0	49.0	47.0	46.0	46.0	50.6	10.0	60.6
	6	54.0	72.3	47.4	62.0	60.0	57.0	56.0	53.0	52.0	49.0	49.0	48.0	54.0	10.0	64.0
Day	7	55.2	83.6	47.2	63.0	60.0	56.0	55.0	52.0	50.0	49.0	48.0	47.0	55.2	0.0	55.2
	8	49.9	67.7	41.2	57.0	55.0	53.0	52.0	50.0	48.0	44.0	43.0	42.0	49.9	0.0	49.9
	9	48.4	67.8	40.0	59.0	56.0	52.0	51.0	46.0	44.0	42.0	41.0	41.0	48.4	0.0	48.4
	10	52.7	74.7	39.9	66.0	62.0	55.0	53.0	48.0	45.0	42.0	42.0	41.0	52.7	0.0	52.7
	11	50.1	76.7	40.0	58.0	55.0	51.0	50.0	47.0	44.0	42.0	41.0	41.0	50.1	0.0	50.1
	12	48.0	70.5	39.8	57.0	55.0	52.0	50.0	46.0	45.0	42.0	41.0	40.0	48.0	0.0	48.0
	13	47.0	67.1	39.7	56.0	54.0	51.0	49.0	46.0	44.0	41.0	41.0	40.0	47.0	0.0	47.0
	14	47.7	64.8	38.2	57.0	55.0	52.0	51.0	47.0	45.0	42.0	41.0	40.0	47.7	0.0	47.7
	15	49.1	68.9	41.2	60.0	56.0	52.0	50.0	47.0	45.0	43.0	43.0	42.0	49.1	0.0	49.1
	16	49.7	76.3	41.2	57.0	55.0	52.0	51.0	47.0	46.0	44.0	43.0	42.0	49.7	0.0	49.7
	17	50.0	69.7	43.0	59.0	57.0	54.0	52.0	48.0	47.0	45.0	44.0	43.0	50.0	0.0	50.0
	18	51.9	70.8	42.0	62.0	61.0	57.0	55.0	49.0	47.0	44.0	44.0	43.0	51.9	0.0	51.9
Evening	19	48.3	65.1	42.1	58.0	56.0	52.0	50.0	47.0	45.0	43.0	43.0	43.0	48.3	5.0	53.3
	20	51.4	78.7	41.1	60.0	57.0	52.0	50.0	46.0	44.0	42.0	42.0	41.0	51.4	5.0	56.4
	21	46.1	69.9	38.2	56.0	53.0	49.0	47.0	44.0	42.0	40.0	40.0	39.0	46.1	5.0	51.1
Night	22	46.0	68.7	39.9	55.0	53.0	49.0	47.0	44.0	42.0	40.0	40.0	40.0	46.0	10.0	56.0
	23	45.5	60.8	40.0	54.0	52.0	48.0	47.0	45.0	44.0	42.0	41.0	41.0	45.5	10.0	55.5

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	47.0	64.8	38.2	56.0	54.0	51.0	49.0	46.0	44.0	41.0	41.0	40.0
	Max	55.2	83.6	47.2	66.0	62.0	57.0	55.0	52.0	50.0	49.0	48.0	47.0
Energy Average		50.6	Average:		59.3	56.8	53.1	51.6	47.8	45.8	43.3	42.7	41.8
Evening	Min	46.1	65.1	38.2	56.0	53.0	49.0	47.0	44.0	42.0	40.0	40.0	39.0
	Max	51.4	78.7	42.1	60.0	57.0	52.0	50.0	47.0	45.0	43.0	43.0	43.0
Energy Average		49.1	Average:		58.0	55.3	51.0	49.0	45.7	43.7	41.7	41.7	41.0
Night	Min	45.5	60.8	39.9	51.0	50.0	48.0	47.0	44.0	42.0	40.0	40.0	40.0
	Max	54.0	72.3	47.4	62.0	60.0	57.0	56.0	53.0	52.0	49.0	49.0	48.0
Energy Average		49.4	Average:		55.7	53.4	51.0	50.1	47.7	46.6	44.4	44.2	43.8

L_{eq} (dBA)

24-Hour	*Daytime*	*Nighttime*
50.0	**50.4**	**49.4**

24-Hour CNEL (dBA)

56.2

APPENDIX 7.1:

OPERATIONAL STATIONARY-SOURCE NOISE CALCULATIONS

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STATIONARY SOURCE NOISE PREDICTION MODEL 10/5/2019

Observer Location: **R1**
Source: Unloading/Docking Activity
Condition: Operational

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	56.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	56.0 feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	56.0	-5.4	-5.4	-5.4	-5.4	-5.4	-5.4
Shielding (Barrier Attenuation)	56.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		61.8	-5.4	-5.4	-5.4	-5.4	-5.4
60 Minute Hourly Adjustment		**61.8**	**-5.4**	**-5.4**	**-5.4**	**-5.4**	**-5.4**

STATIONARY SOURCE NOISE PREDICTION MODEL 10/5/2019

Observer Location: **R1**
Source: Roof-Top Air Conditioning Unit
Condition: Operational

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	234.0 feet	***Barrier Height:***	**5.0 feet**
Noise Distance to Barrier:	75.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	159.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	30.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	30.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	234.0	-33.4	-33.4	-33.4	-33.4	-33.4	-33.4
Shielding (Barrier Attenuation)	75.0	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9
Raw (Distance + Barrier)		33.9	-43.3	-43.3	-43.3	-43.3	-43.3
39 Minute Hourly Adjustment		**32.0**	**-45.2**	**-45.2**	**-45.2**	**-45.2**	**-45.2**

STATIONARY SOURCE NOISE PREDICTION MODEL

10/5/2019

Observer Location: **R1**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	30.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	30.0 feet	*Noise Source Height:*	2.5 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	30.0	-7.2	-7.2	-7.2	-7.2	-7.2	-7.2
Shielding (Barrier Attenuation)	30.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		45.0	-7.2	-7.2	-7.2	-7.2	-7.2
60 Minute Hourly Adjustment		**45.0**	**-7.2**	**-7.2**	**-7.2**	**-7.2**	**-7.2**

STATIONARY SOURCE NOISE PREDICTION MODEL

10/5/2019

Observer Location: **R2**
Source: Unloading/Docking Activity
Condition: Operational

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	206.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	206.0 feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	206.0	-16.7	-16.7	-16.7	-16.7	-16.7	-16.7
Shielding (Barrier Attenuation)	206.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		50.5	-16.7	-16.7	-16.7	-16.7	-16.7
60 Minute Hourly Adjustment		**50.5**	**-16.7**	**-16.7**	**-16.7**	**-16.7**	**-16.7**

STATIONARY SOURCE NOISE PREDICTION MODEL

10/5/2019

Observer Location: **R2**
Source: Roof-Top Air Conditioning Unit
Condition: Operational

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	253.0 feet	***Barrier Height:***	**5.0 feet**
Noise Distance to Barrier:	10.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	243.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	30.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	30.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	253.0	-34.1	-34.1	-34.1	-34.1	-34.1	-34.1
Shielding (Barrier Attenuation)	10.0	-5.7	-5.7	-5.7	-5.7	-5.7	-5.7
Raw (Distance + Barrier)		37.4	-39.8	-39.8	-39.8	-39.8	-39.8
39 Minute Hourly Adjustment		**35.5**	**-41.7**	**-41.7**	**-41.7**	**-41.7**	**-41.7**

STATIONARY SOURCE NOISE PREDICTION MODEL

10/5/2019

Observer Location: **R2**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	176.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	176.0 feet	*Noise Source Height:*	2.5 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	176.0	-18.7	-18.7	-18.7	-18.7	-18.7	-18.7
Shielding (Barrier Attenuation)	176.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		33.5	-18.7	-18.7	-18.7	-18.7	-18.7
60 Minute Hourly Adjustment		**33.5**	**-18.7**	**-18.7**	**-18.7**	**-18.7**	**-18.7**

STATIONARY SOURCE NOISE PREDICTION MODEL

10/5/2019

Observer Location: **R3**
Source: Unloading/Docking Activity
Condition: Operational

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	139.0 feet	***Barrier Height:***	**12.0 feet**
Noise Distance to Barrier:	10.0 feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	129.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	139.0	-13.3	-13.3	-13.3	-13.3	-13.3	-13.3
Shielding (Barrier Attenuation)	10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0
Raw (Distance + Barrier)		43.9	-23.3	-23.3	-23.3	-23.3	-23.3
60 Minute Hourly Adjustment		**43.9**	**-23.3**	**-23.3**	**-23.3**	**-23.3**	**-23.3**

STATIONARY SOURCE NOISE PREDICTION MODEL

10/5/2019

Observer Location: **R3**
Source: Roof-Top Air Conditioning Unit
Condition: Operational

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	191.0 feet	***Barrier Height:***	**5.0 feet**
Noise Distance to Barrier:	10.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	181.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	30.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	30.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	191.0	-31.6	-31.6	-31.6	-31.6	-31.6	-31.6
Shielding (Barrier Attenuation)	10.0	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2
Raw (Distance + Barrier)		39.4	-37.8	-37.8	-37.8	-37.8	-37.8
39 Minute Hourly Adjustment		**37.5**	**-39.7**	**-39.7**	**-39.7**	**-39.7**	**-39.7**

STATIONARY SOURCE NOISE PREDICTION MODEL

10/5/2019

Observer Location: **R3**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	121.0 feet	***Barrier Height:***	**12.0 feet**
Noise Distance to Barrier:	10.0 feet	*Noise Source Height:*	2.5 feet
Barrier Distance to Observer:	111.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	121.0	-16.2	-16.2	-16.2	-16.2	-16.2	-16.2
Shielding (Barrier Attenuation)	10.0	-14.5	-14.5	-14.5	-14.5	-14.5	-14.5
Raw (Distance + Barrier)		21.5	-30.7	-30.7	-30.7	-30.7	-30.7
60 Minute Hourly Adjustment		**21.5**	**-30.7**	**-30.7**	**-30.7**	**-30.7**	**-30.7**

STATIONARY SOURCE NOISE PREDICTION MODEL

10/5/2019

Observer Location: **R4**
Source: Unloading/Docking Activity
Condition: Operational

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	222.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	195.0 feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	27.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	222.0	-17.4	-17.4	-17.4	-17.4	-17.4	-17.4
Shielding (Barrier Attenuation)	195.0	-5.1	-5.1	-5.1	-5.1	-5.1	-5.1
Raw (Distance + Barrier)		44.7	-22.5	-22.5	-22.5	-22.5	-22.5
60 Minute Hourly Adjustment		**44.7**	**-22.5**	**-22.5**	**-22.5**	**-22.5**	**-22.5**

STATIONARY SOURCE NOISE PREDICTION MODEL

10/5/2019

Observer Location: **R4**
Source: Roof-Top Air Conditioning Unit
Condition: Operational

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	86.0 feet	***Barrier Height:***	**5.0 feet**
Noise Distance to Barrier:	10.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	76.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	30.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	30.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	86.0	-24.7	-24.7	-24.7	-24.7	-24.7	-24.7
Shielding (Barrier Attenuation)	10.0	-9.0	-9.0	-9.0	-9.0	-9.0	-9.0
Raw (Distance + Barrier)		43.5	-33.7	-33.7	-33.7	-33.7	-33.7
39 Minute Hourly Adjustment		**41.6**	**-35.6**	**-35.6**	**-35.6**	**-35.6**	**-35.6**

STATIONARY SOURCE NOISE PREDICTION MODEL

10/5/2019

Observer Location: **R4**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	28.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	10.0 feet	*Noise Source Height:*	2.5 feet
Barrier Distance to Observer:	18.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	28.0	-6.7	-6.7	-6.7	-6.7	-6.7	-6.7
Shielding (Barrier Attenuation)	10.0	-8.5	-8.5	-8.5	-8.5	-8.5	-8.5
Raw (Distance + Barrier)		37.0	-15.2	-15.2	-15.2	-15.2	-15.2
60 Minute Hourly Adjustment		**37.0**	**-15.2**	**-15.2**	**-15.2**	**-15.2**	**-15.2**

STATIONARY SOURCE NOISE PREDICTION MODEL

10/5/2019

Observer Location: **R5**
Source: Unloading/Docking Activity
Condition: Operational

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	212.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	195.0 feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	17.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	212.0	-17.0	-17.0	-17.0	-17.0	-17.0	-17.0
Shielding (Barrier Attenuation)	195.0	-5.2	-5.2	-5.2	-5.2	-5.2	-5.2
Raw (Distance + Barrier)		45.0	-22.2	-22.2	-22.2	-22.2	-22.2
60 Minute Hourly Adjustment		**45.0**	**-22.2**	**-22.2**	**-22.2**	**-22.2**	**-22.2**

STATIONARY SOURCE NOISE PREDICTION MODEL

10/5/2019

Observer Location: **R5**
Source: Roof-Top Air Conditioning Unit
Condition: Operational

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	85.0 feet	***Barrier Height:***	**5.0 feet**
Noise Distance to Barrier:	10.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	75.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	30.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	30.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	85.0	-24.6	-24.6	-24.6	-24.6	-24.6	-24.6
Shielding (Barrier Attenuation)	10.0	-9.1	-9.1	-9.1	-9.1	-9.1	-9.1
Raw (Distance + Barrier)		43.5	-33.7	-33.7	-33.7	-33.7	-33.7
39 Minute Hourly Adjustment		**41.6**	**-35.6**	**-35.6**	**-35.6**	**-35.6**	**-35.6**

STATIONARY SOURCE NOISE PREDICTION MODEL

10/5/2019

Observer Location: **R5**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	22.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	10.0 feet	*Noise Source Height:*	2.5 feet
Barrier Distance to Observer:	12.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	22.0	-5.1	-5.1	-5.1	-5.1	-5.1	-5.1
Shielding (Barrier Attenuation)	10.0	-8.4	-8.4	-8.4	-8.4	-8.4	-8.4
Raw (Distance + Barrier)		38.7	-13.5	-13.5	-13.5	-13.5	-13.5
60 Minute Hourly Adjustment		**38.7**	**-13.5**	**-13.5**	**-13.5**	**-13.5**	**-13.5**

STATIONARY SOURCE NOISE PREDICTION MODEL

10/5/2019

Observer Location: **R6**
Source: Unloading/Docking Activity
Condition: Operational

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	332.0 feet	***Barrier Height:***	**30.0 feet**
Noise Distance to Barrier:	10.0 feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	322.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	332.0	-20.9	-20.9	-20.9	-20.9	-20.9	-20.9
Shielding (Barrier Attenuation)	10.0	-17.7	-17.7	-17.7	-17.7	-17.7	-17.7
Raw (Distance + Barrier)		28.6	-38.6	-38.6	-38.6	-38.6	-38.6
60 Minute Hourly Adjustment		**28.6**	**-38.6**	**-38.6**	**-38.6**	**-38.6**	**-38.6**

STATIONARY SOURCE NOISE PREDICTION MODEL

10/5/2019

Observer Location: **R6**
Source: Roof-Top Air Conditioning Unit
Condition: Operational

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	161.0	feet	***Barrier Height:***	**5.0 feet**
Noise Distance to Barrier:	10.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	151.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	30.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	30.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	161.0	-30.2	-30.2	-30.2	-30.2	-30.2	-30.2
Shielding (Barrier Attenuation)	10.0	-6.6	-6.6	-6.6	-6.6	-6.6	-6.6
Raw (Distance + Barrier)		40.4	-36.8	-36.8	-36.8	-36.8	-36.8
39 Minute Hourly Adjustment		**38.5**	**-38.7**	**-38.7**	**-38.7**	**-38.7**	**-38.7**

STATIONARY SOURCE NOISE PREDICTION MODEL

10/5/2019

Observer Location: **R6**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	127.0	feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	10.0	feet	*Noise Source Height:*	2.5 feet
Barrier Distance to Observer:	117.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	0.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	127.0	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6
Shielding (Barrier Attenuation)	10.0	-8.8	-8.8	-8.8	-8.8	-8.8	-8.8
Raw (Distance + Barrier)		26.8	-25.4	-25.4	-25.4	-25.4	-25.4
60 Minute Hourly Adjustment		**26.8**	**-25.4**	**-25.4**	**-25.4**	**-25.4**	**-25.4**

STATIONARY SOURCE NOISE PREDICTION MODEL 10/5/2019

Observer Location: **R1**
Source: Unloading/Docking Activity
Condition: Operational (Mitigated)

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	56.0 feet	***Barrier Height:***	**8.0 feet**
Noise Distance to Barrier:	35.0 feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	21.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	56.0	-5.4	-5.4	-5.4	-5.4	-5.4	-5.4
Shielding (Barrier Attenuation)	35.0	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2
Raw (Distance + Barrier)		55.6	-11.6	-11.6	-11.6	-11.6	-11.6
60 Minute Hourly Adjustment		**55.6**	**-11.6**	**-11.6**	**-11.6**	**-11.6**	**-11.6**

STATIONARY SOURCE NOISE PREDICTION MODEL 10/5/2019

Observer Location: **R1**
Source: Roof-Top Air Conditioning Unit
Condition: Operational (Mitigated)

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	234.0 feet	***Barrier Height:***	**5.0 feet**
Noise Distance to Barrier:	75.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	159.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	30.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	30.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	234.0	-33.4	-33.4	-33.4	-33.4	-33.4	-33.4
Shielding (Barrier Attenuation)	75.0	-9.9	-9.9	-9.9	-9.9	-9.9	-9.9
Raw (Distance + Barrier)		33.9	-43.3	-43.3	-43.3	-43.3	-43.3
39 Minute Hourly Adjustment		**32.0**	**-45.2**	**-45.2**	**-45.2**	**-45.2**	**-45.2**

STATIONARY SOURCE NOISE PREDICTION MODEL 10/5/2019

Observer Location: **R1**
Source: Parking Lot Vehicle Movements
Condition: Operational (Mitigated)

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	30.0 feet	***Barrier Height:***	**8.0 feet**
Noise Distance to Barrier:	10.0 feet	*Noise Source Height:*	2.5 feet
Barrier Distance to Observer:	20.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	30.0	-7.2	-7.2	-7.2	-7.2	-7.2	-7.2
Shielding (Barrier Attenuation)	10.0	-11.3	-11.3	-11.3	-11.3	-11.3	-11.3
Raw (Distance + Barrier)		33.7	-18.5	-18.5	-18.5	-18.5	-18.5
60 Minute Hourly Adjustment		**33.7**	**-18.5**	**-18.5**	**-18.5**	**-18.5**	**-18.5**

STATIONARY SOURCE NOISE PREDICTION MODEL 10/5/2019

Observer Location: **R2**
Source: Unloading/Docking Activity
Condition: Operational (Mitigated)

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	206.0 feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	206.0 feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	0.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	206.0	-16.7	-16.7	-16.7	-16.7	-16.7	-16.7
Shielding (Barrier Attenuation)	206.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		50.5	-16.7	-16.7	-16.7	-16.7	-16.7
60 Minute Hourly Adjustment		**50.5**	**-16.7**	**-16.7**	**-16.7**	**-16.7**	**-16.7**

STATIONARY SOURCE NOISE PREDICTION MODEL

10/5/2019

Observer Location: **R2**
Source: Roof-Top Air Conditioning Unit
Condition: Operational (Mitigated)

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	253.0	feet	***Barrier Height:***	**5.0 feet**
Noise Distance to Barrier:	10.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	243.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	30.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	30.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	253.0	-34.1	-34.1	-34.1	-34.1	-34.1	-34.1
Shielding (Barrier Attenuation)	10.0	-5.7	-5.7	-5.7	-5.7	-5.7	-5.7
Raw (Distance + Barrier)		37.4	-39.8	-39.8	-39.8	-39.8	-39.8
39 Minute Hourly Adjustment		**35.5**	**-41.7**	**-41.7**	**-41.7**	**-41.7**	**-41.7**

STATIONARY SOURCE NOISE PREDICTION MODEL

10/5/2019

Observer Location: **R2**
Source: Parking Lot Vehicle Movements
Condition: Operational (Mitigated)

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	176.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	176.0	feet	*Noise Source Height:*	2.5 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	0.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	176.0	-18.7	-18.7	-18.7	-18.7	-18.7	-18.7
Shielding (Barrier Attenuation)	176.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		33.5	-18.7	-18.7	-18.7	-18.7	-18.7
60 Minute Hourly Adjustment		**33.5**	**-18.7**	**-18.7**	**-18.7**	**-18.7**	**-18.7**

STATIONARY SOURCE NOISE PREDICTION MODEL

10/5/2019

Observer Location: **R3**
Source: Unloading/Docking Activity
Condition: Operational (Mitigated)

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	139.0 feet	***Barrier Height:***	**12.0 feet**
Noise Distance to Barrier:	10.0 feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	129.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	139.0	-13.3	-13.3	-13.3	-13.3	-13.3	-13.3
Shielding (Barrier Attenuation)	10.0	-10.0	-10.0	-10.0	-10.0	-10.0	-10.0
Raw (Distance + Barrier)		43.9	-23.3	-23.3	-23.3	-23.3	-23.3
60 Minute Hourly Adjustment		**43.9**	**-23.3**	**-23.3**	**-23.3**	**-23.3**	**-23.3**

STATIONARY SOURCE NOISE PREDICTION MODEL

10/5/2019

Observer Location: **R3**
Source: Roof-Top Air Conditioning Unit
Condition: Operational (Mitigated)

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	191.0 feet	***Barrier Height:***	**5.0 feet**
Noise Distance to Barrier:	10.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	181.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	30.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	30.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	191.0	-31.6	-31.6	-31.6	-31.6	-31.6	-31.6
Shielding (Barrier Attenuation)	10.0	-6.2	-6.2	-6.2	-6.2	-6.2	-6.2
Raw (Distance + Barrier)		39.4	-37.8	-37.8	-37.8	-37.8	-37.8
39 Minute Hourly Adjustment		**37.5**	**-39.7**	**-39.7**	**-39.7**	**-39.7**	**-39.7**

STATIONARY SOURCE NOISE PREDICTION MODEL

10/5/2019

Observer Location: **R3**
Source: Parking Lot Vehicle Movements
Condition: Operational (Mitigated)

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	121.0 feet	***Barrier Height:***	**12.0 feet**
Noise Distance to Barrier:	10.0 feet	*Noise Source Height:*	2.5 feet
Barrier Distance to Observer:	111.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	121.0	-16.2	-16.2	-16.2	-16.2	-16.2	-16.2
Shielding (Barrier Attenuation)	10.0	-14.5	-14.5	-14.5	-14.5	-14.5	-14.5
Raw (Distance + Barrier)		21.5	-30.7	-30.7	-30.7	-30.7	-30.7
60 Minute Hourly Adjustment		**21.5**	**-30.7**	**-30.7**	**-30.7**	**-30.7**	**-30.7**

STATIONARY SOURCE NOISE PREDICTION MODEL

10/5/2019

Observer Location: **R4**
Source: Unloading/Docking Activity
Condition: Operational (Mitigated)

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	222.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	195.0 feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	27.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	222.0	-17.4	-17.4	-17.4	-17.4	-17.4	-17.4
Shielding (Barrier Attenuation)	195.0	-5.1	-5.1	-5.1	-5.1	-5.1	-5.1
Raw (Distance + Barrier)		44.7	-22.5	-22.5	-22.5	-22.5	-22.5
60 Minute Hourly Adjustment		**44.7**	**-22.5**	**-22.5**	**-22.5**	**-22.5**	**-22.5**

STATIONARY SOURCE NOISE PREDICTION MODEL

10/5/2019

Observer Location: **R4**
Source: Roof-Top Air Conditioning Unit
Condition: Operational (Mitigated)

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	86.0 feet	***Barrier Height:***	**5.0 feet**
Noise Distance to Barrier:	10.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	76.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	30.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	30.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	86.0	-24.7	-24.7	-24.7	-24.7	-24.7	-24.7
Shielding (Barrier Attenuation)	10.0	-9.0	-9.0	-9.0	-9.0	-9.0	-9.0
Raw (Distance + Barrier)		43.5	-33.7	-33.7	-33.7	-33.7	-33.7
39 Minute Hourly Adjustment		**41.6**	**-35.6**	**-35.6**	**-35.6**	**-35.6**	**-35.6**

STATIONARY SOURCE NOISE PREDICTION MODEL

10/5/2019

Observer Location: **R4**
Source: Parking Lot Vehicle Movements
Condition: Operational (Mitigated)

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	28.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	10.0 feet	*Noise Source Height:*	2.5 feet
Barrier Distance to Observer:	18.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	28.0	-6.7	-6.7	-6.7	-6.7	-6.7	-6.7
Shielding (Barrier Attenuation)	10.0	-8.5	-8.5	-8.5	-8.5	-8.5	-8.5
Raw (Distance + Barrier)		37.0	-15.2	-15.2	-15.2	-15.2	-15.2
60 Minute Hourly Adjustment		**37.0**	**-15.2**	**-15.2**	**-15.2**	**-15.2**	**-15.2**

STATIONARY SOURCE NOISE PREDICTION MODEL 10/5/2019

Observer Location: **R5**
Source: Unloading/Docking Activity
Condition: Operational (Mitigated)

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	212.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	195.0 feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	17.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	212.0	-17.0	-17.0	-17.0	-17.0	-17.0	-17.0
Shielding (Barrier Attenuation)	195.0	-5.2	-5.2	-5.2	-5.2	-5.2	-5.2
Raw (Distance + Barrier)		45.0	-22.2	-22.2	-22.2	-22.2	-22.2
60 Minute Hourly Adjustment		**45.0**	**-22.2**	**-22.2**	**-22.2**	**-22.2**	**-22.2**

STATIONARY SOURCE NOISE PREDICTION MODEL 10/5/2019

Observer Location: **R5**
Source: Roof-Top Air Conditioning Unit
Condition: Operational (Mitigated)

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	85.0 feet	***Barrier Height:***	**5.0 feet**
Noise Distance to Barrier:	10.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	75.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	30.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	30.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	85.0	-24.6	-24.6	-24.6	-24.6	-24.6	-24.6
Shielding (Barrier Attenuation)	10.0	-9.1	-9.1	-9.1	-9.1	-9.1	-9.1
Raw (Distance + Barrier)		43.5	-33.7	-33.7	-33.7	-33.7	-33.7
39 Minute Hourly Adjustment		**41.6**	**-35.6**	**-35.6**	**-35.6**	**-35.6**	**-35.6**

STATIONARY SOURCE NOISE PREDICTION MODEL

10/5/2019

Observer Location: **R5**
Source: Parking Lot Vehicle Movements
Condition: Operational (Mitigated)

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	22.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	10.0 feet	*Noise Source Height:*	2.5 feet
Barrier Distance to Observer:	12.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	22.0	-5.1	-5.1	-5.1	-5.1	-5.1	-5.1
Shielding (Barrier Attenuation)	10.0	-8.4	-8.4	-8.4	-8.4	-8.4	-8.4
Raw (Distance + Barrier)		38.7	-13.5	-13.5	-13.5	-13.5	-13.5
60 Minute Hourly Adjustment		**38.7**	**-13.5**	**-13.5**	**-13.5**	**-13.5**	**-13.5**

STATIONARY SOURCE NOISE PREDICTION MODEL

10/5/2019

Observer Location: **R6**
Source: Unloading/Docking Activity
Condition: Operational (Mitigated)

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	332.0 feet	***Barrier Height:***	**30.0 feet**
Noise Distance to Barrier:	10.0 feet	*Noise Source Height:*	8.0 feet
Barrier Distance to Observer:	322.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	30.0	67.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	332.0	-20.9	-20.9	-20.9	-20.9	-20.9	-20.9
Shielding (Barrier Attenuation)	10.0	-17.7	-17.7	-17.7	-17.7	-17.7	-17.7
Raw (Distance + Barrier)		28.6	-38.6	-38.6	-38.6	-38.6	-38.6
60 Minute Hourly Adjustment		**28.6**	**-38.6**	**-38.6**	**-38.6**	**-38.6**	**-38.6**

STATIONARY SOURCE NOISE PREDICTION MODEL

10/5/2019

Observer Location: **R6**
Source: Roof-Top Air Conditioning Unit
Condition: Operational (Mitigated)

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	161.0 feet	***Barrier Height:***	**5.0 feet**
Noise Distance to Barrier:	10.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	151.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	30.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	30.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	161.0	-30.2	-30.2	-30.2	-30.2	-30.2	-30.2
Shielding (Barrier Attenuation)	10.0	-6.6	-6.6	-6.6	-6.6	-6.6	-6.6
Raw (Distance + Barrier)		40.4	-36.8	-36.8	-36.8	-36.8	-36.8
39 Minute Hourly Adjustment		**38.5**	**-38.7**	**-38.7**	**-38.7**	**-38.7**	**-38.7**

STATIONARY SOURCE NOISE PREDICTION MODEL

10/5/2019

Observer Location: **R6**
Source: Parking Lot Vehicle Movements
Condition: Operational (Mitigated)

Project Name: 9th/Vineyard
Job Number: 12377
Analyst: B. Lawson

NOISE MODEL INPUTS

Noise Distance to Observer	127.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	10.0 feet	*Noise Source Height:*	2.5 feet
Barrier Distance to Observer:	117.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	127.0	-16.6	-16.6	-16.6	-16.6	-16.6	-16.6
Shielding (Barrier Attenuation)	10.0	-8.8	-8.8	-8.8	-8.8	-8.8	-8.8
Raw (Distance + Barrier)		26.8	-25.4	-25.4	-25.4	-25.4	-25.4
60 Minute Hourly Adjustment		**26.8**	**-25.4**	**-25.4**	**-25.4**	**-25.4**	**-25.4**