
APPENDIX H

NOISE IMPACT ANALYSIS



Vista Cove

NOISE IMPACT ANALYSIS

CITY OF VALLEJO

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LIST OF ABBREVIATED TERMS

(#)	Reference
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
HVAC	Heating, Ventilation, and Air Conditioning
IEC	International Electrotechnical Commission
INCE	Institute of Noise Control Engineering
I-780	Interstate 780
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
PPV	Peak Particle Velocity
Project	Vista Cove
RMS	Root-mean-square
VdB	Vibration Decibels

EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to identify noise impacts and any necessary noise mitigation measures for the Vista Cove development ("Project") located at Shady Lane and Wildflower Road (APN's 0037-030-200, 0037-030-210, 0037-060-480), in the City of Vallejo. The proposed Project would subdivide 20.13 acres and develop 51 single-family detached homes on approximately 10 acres, with the remaining area being open space. This study has been prepared to satisfy the applicable City of Vallejo standards and thresholds of significance based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1)

EXTERIOR NOISE ABATEMENT

To satisfy the City of Vallejo exterior noise level standard of 60 dBA L_{dn} for single-family residential land uses, the construction of a noise barrier is recommended for the outdoor living area (backyards) of Lots 8 and 16, adjacent to Interstate 780 (I-780). With the recommended noise barriers shown in Exhibit ES-A, the future exterior noise levels will range from 26.9 to 59.5 dBA CNEL. This noise analysis shows that the recommended noise barrier will satisfy the City of Vallejo 60 dBA L_{dn} exterior noise level standards for single-residential land uses. The effective noise barrier height recommendations represent the minimum wall and/or berm combination height required to satisfy the City of Vallejo exterior noise level standards.

The recommended noise control barriers shall be constructed so that the top of each wall and/or berm combination extends to the planned height above the pad elevation of the lot it is shielding. When the road is elevated above the pad elevation, the barrier shall extend to the recommended height above the highest point between the residential home and the road. The barrier shall provide a surface area weight of at least 4 pounds per square foot 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 noise barrier shall be constructed using the following materials:

- Masonry block;
- Stucco veneer over wood framing (or foam core), or 1-inch-thick tongue and groove wood of sufficient weight per square foot;
- Glass (1/4-inch-thick), or other transparent material with sufficient weight per square foot capable of providing a minimum transmission loss of 20 dBA;
- Earthen berm;
- Any combination of these construction materials.
- The barrier 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.

EXHIBIT ES-A: RECOMMENDED BARRIER LOCATIONS



INTERIOR NOISE ABATEMENT

Typical building construction will provide a Noise Reduction (NR) of approximately 12 dBA with "windows open" and a minimum 25 dBA noise reduction with "windows closed." (3) The interior noise level analysis shows that the City of Vallejo 45 dBA CNEL interior noise standard can be satisfied using standard windows and mechanical ventilation (e.g., air conditioning) being provided for all units. Since Project architectural plans are unavailable at this time, the Project should submit a final interior noise analysis to the building department during the final plan check.

OFF-SITE TRAFFIC NOISE

The expected Project is anticipated to generate approximately 510 trips per day. The location where the greatest chance of an impact occurs is at the residence near the Project site entrance and at Shady Lane and Wildflower Avenue. Without consideration of any barriers, the Project is predicted to generate a noise level of 50.2 dBA CNEL at the nearest building façade. Therefore, the Project would not expose existing noise-sensitive receivers to excessive noise levels, and the off-site traffic noise level impacts due to the Project are considered *less than significant*.

OPERATIONAL NOISE

The Project's primary noise sources would be air conditioners. Project operational noise levels at off-site receiver locations are expected to range from 23.7 to 33.3 dBA L_{eq} . Project operational noise levels will satisfy Section 16.502.09 of the City of Vallejo Municipal Code daytime and nighttime noise standards of 60 dBA and 50 dBA L_{eq} , respectively, at all residential receivers. Therefore, Project-related operational noise impacts would be *less than significant*.

CONSTRUCTION NOISE ANALYSIS

Construction noise levels are expected to create temporary and intermittent high noise levels at receivers surrounding the Project site when activities occur at the closest point to the nearby receiver locations from the edge of Project construction activity. Using reference noise levels to represent the construction activities at the Project site, this analysis estimates the Project-related construction noise levels at nearby sensitive receiver locations. The results of the analysis show the highest construction noise levels at the potentially impacted receiver locations are expected to approach 65.0 dBA L_{eq} .

The Project related construction equipment noise levels are anticipated to satisfy the City of Vallejo Municipal Code construction noise level standards of 80 dBA for mobile equipment during typical Project construction activities at all receiver locations. Therefore, the short-term Project construction impacts are considered *less than significant*.

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. Project construction vibration velocity levels are expected to approach 0.07 in/sec PPV at the nearby receiver locations, and will therefore, not exceed the vibration threshold of 0.10 in/sec PPV. Therefore, construction related vibration impacts would be *less than significant*.

SUMMARY OF SIGNIFICANCE FINDINGS

The results of this Vista Cove 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 incorporation of Project design features.

TABLE ES-1: SUMMARY OF SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
On-Site Traffic Noise	7	-	--
Off-Site Traffic Noise	8	<i>Less Than Significant</i>	-
Operational Noise	10	<i>Less Than Significant</i>	-
Construction Noise	11	<i>Less Than Significant</i>	-
Construction Vibration		<i>Less Than Significant</i>	-

1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of the Vista Cove ("Project"). This noise study describes the Project, provides information regarding noise and vibration fundamentals, outlines the local regulatory setting, provides the study methods and procedures for performing noise analysis, evaluates potential noise impacts from the project, and identifies mitigation measures to reduce impacts, as necessary.

1.1 SITE LOCATION

The Project is located at Shady Lane and Wildflower Road in the City of Vallejo. APN's 0037-030-200, 0037-030-210, 0037-060-480, in the City of Vallejo. The Project's location in relation to the surrounding area is shown in Exhibit 1-A. The surrounding land use designations are Residential (Primarily Single Family) to the west, Saint Patrick Saint Vincent High School (Public Facilities and Institutions) to the north across Interstate 780 (I-780), and Parks, Recreation and Open Space to the south and east.

1.2 PROJECT DESCRIPTION

The proposed Project would subdivide 20.13 acres and develop 51 single-family detached homes on approximately 10 acres, with the remaining area being open space. At Buildout the Project is anticipated to generate 510 trips per day. The primary operational noise sources are air conditioning units.

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		
NOISY URBAN AREA, DAYTIME	VACUUM CLEANER AT 3m (10 ft)	70	LOUD	SPEECH INTERFERENCE
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. (4) 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. (5) 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.

To describe the time-varying character of environmental noise, the statistical or percentile noise descriptors L_{50} , L_{25} , L_8 and L_2 , are commonly used. The percentile noise descriptors are the noise levels equaled or exceeded during 50 percent, 25 percent, 8 percent, and 2 percent of a stated time. Sound levels associated with the L_2 and L_8 typically describe transient or short-term events, while levels associated with the L_{50} describe the steady state (or median) noise conditions. While the L_{50} describes the median noise levels occurring 50 percent of the time, the L_{eq} accounts for the total energy (average) observed for the entire hour. Therefore, the L_{eq} noise descriptor is generally 1-2 dBA higher than the L_{50} noise level.

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 Vallejo 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. (4)

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. (6)

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. (4)

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 resident. 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. (6)

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. (6)

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. (7)

2.7 VIBRATION

Per the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual* (8), 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.

Additionally, in contrast to airborne noise, ground-borne vibration outdoors is not a common environmental problem and annoyance from ground-borne vibration is almost exclusively an indoor phenomenon (9). Therefore, the effects of vibrations should only be evaluated at a structure and the effects of the building structure on the vibration should be considered. Wood-frame buildings, such as typical residential structures, are more easily excited by ground vibration than heavier buildings. In contrast, large masonry buildings with spread footings have a low response to ground vibration (9). In general, the heavier a building is, the lower the response will

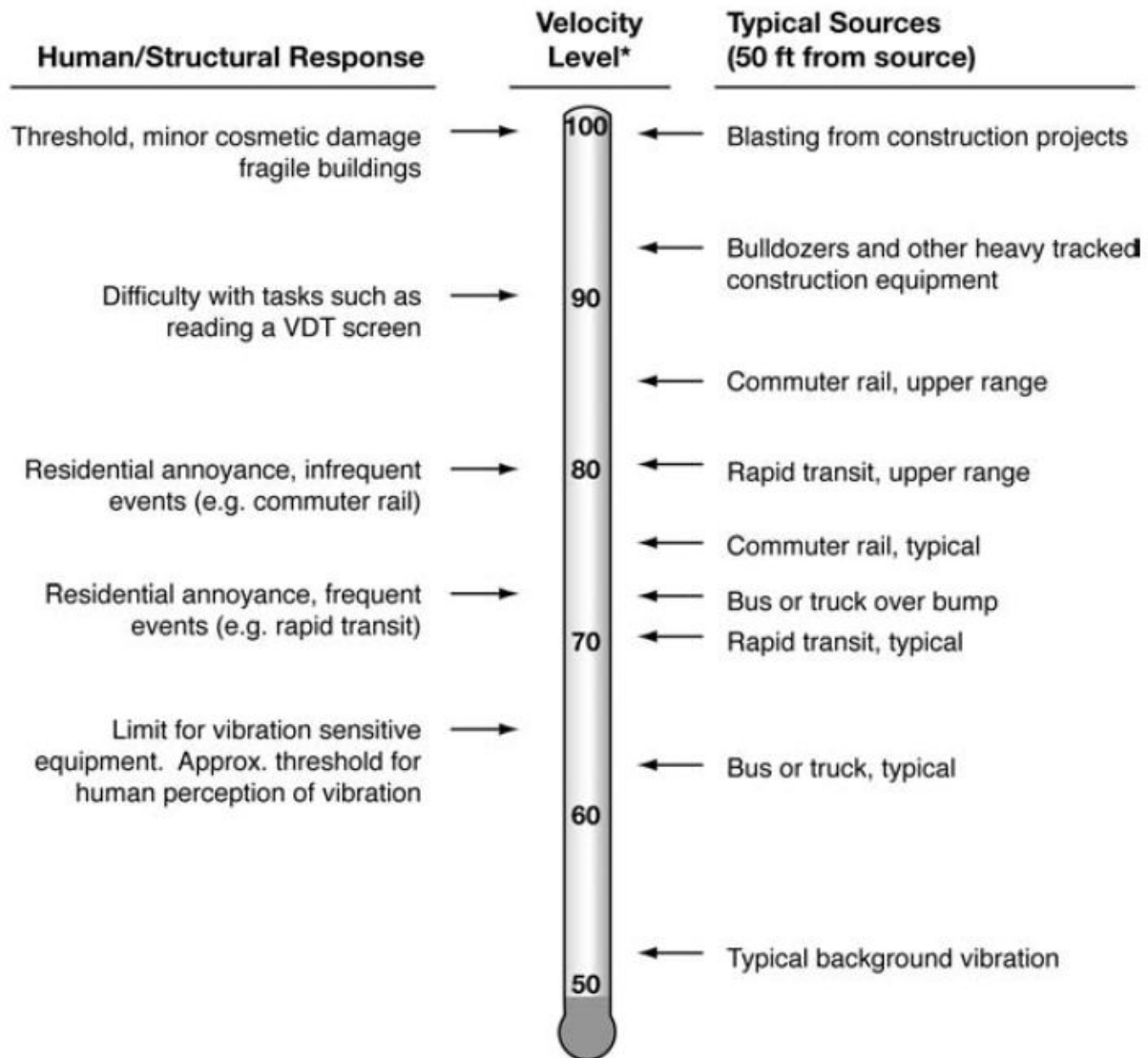
be to the incident vibration energy. However, all structures reduce vibration levels due to the coupling of the building to the soil.

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 (9). 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 (9). However, the RMS amplitude and PPV are related mathematically, and the RMS amplitude of equipment is typically calculated from the PPV reference level. The RMS amplitude is approximately 70% of the PPV (10). Thus, either can be used on the description of vibration impacts.

While not universally accepted, vibration decibel notation (VdB) is another vibration notation developed and used by the FTA in their guidance manual to describe vibration levels and provide a background of common vibration levels and set vibration limits (8). Decibel notation (VdB) serves to reduce the range of numbers used to describe vibration levels and is used in this report to describe vibration levels.

As stated in the FTA guidance manual, 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 (9). 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-B illustrates common vibration sources and the human and structural response to ground-borne vibration.

EXHIBIT 2-B: 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.

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 according to guidelines adopted by the Governor's Office of Planning and Research. (11) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*. In addition, the California Environmental Quality Act (CEQA) requires that all known environmental effects of a project be analyzed, including environmental noise impacts.

3.2 STATE OF CALIFORNIA BUILDING CODE

The State of California's noise insulation standards for dwelling and sleeping units are codified in the California Code of Regulations, Title 24, Building Standards Administrative Code, Chapter 12, Section 1206 Sound Control. These noise standards are applied to new construction in California for controlling interior noise levels resulting from exterior noise sources within habitable rooms of dwelling and sleeping units. For new construction, the acceptable interior noise limit is 45 dBA CNEL in habitable rooms (12).

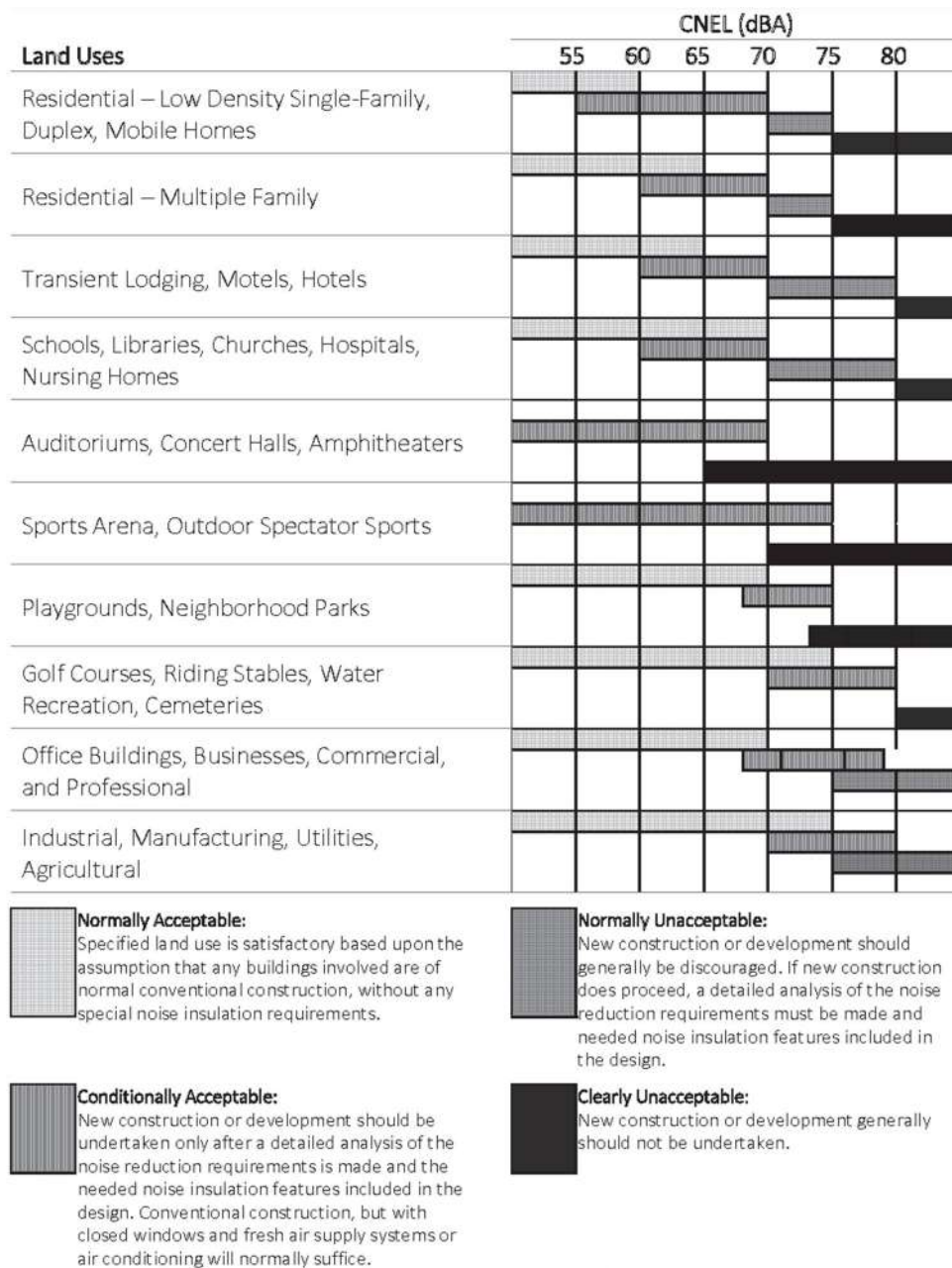
3.3 CITY OF VALLEJO GENERAL PLAN NOISE STANDARDS

The City of Vallejo has adopted a noise standards specifying land use compatibility standards in the Nature & Built Environment Chapter of the General Plan to limit exposure to noise and to minimize adverse effects on sensitive receptors like homes and schools. (13) The General Plan specifies the exterior noise levels, described in L_{dn} , allowable for new developments impacted by transportation noise sources such as arterial roads, freeways, airports and railroads. (13) To ensure compatible noise levels at noise sensitive receivers the City of Vallejo General Plan contains the following policies and actions related to the Project:

- POLICY NBE-5.13 Noise Control. Ensure that noise does not affect quality of life in the community.*
- Action NBE-5.13C Update City regulations to restrict the allowable hours to between 7 AM and 7 PM on weekdays for construction, demolition, maintenance, and loading/unloading activities that may impact noise-sensitive land uses.*

- POLICY NBE-5.14** *Vibration Control. Ensure that vibration does not affect quality of life in the community.*
- Action NBE-5.14A** *Update City regulations to establish quantified vibration level limits similar to commonly used guidelines found in the Federal Transit Administration document "Transit Noise and Vibration Impact Assessment" (2006)*
- POLICY NBE-5.15** *Noise Compatibility Standards. Apply the General Plan noise and land use compatibility standards to all new residential, commercial, and mixed-use development and redevelopment*
- Action NBE-5.15A** *For new single-family residential projects, use a standard of 60 L_{dn} for exterior noise in private use areas, and require appropriate impact mitigation.*
- Action NBE-5.15D** *Require maximum interior noise levels at 45 L_{dn} in all new residential units, and require appropriate impact mitigation*
- Action NBE-5.15E** *When approving new development, limit project-related noise increases to the following for permanent stationary and transportation-related noise sources:*
- *no more than 10 dB in non-residential areas;*
 - *no more than 5 dB in residential areas where the with-project noise level is less than the maximum "normally acceptable" level in the Noise and Land Use Compatibility figure; and*
 - *no more than 3 dB where the with-project noise level exceeds the "normally acceptable" level in Noise and Land Use Compatibility figure.*
- Action NBE-5.15F** *Require acoustical studies with appropriate mitigation measures for projects that are likely to be exposed to noise levels that exceed the 'normally acceptable' standard and for any other projects that are likely to generate noise in excess of these standards.*

The noise policies consider land use compatibility and identify exterior noise level compatibility standards for transportation related noise. Table NBE-1 of the City of Vallejo General Plan, *California Land Use Compatibility for Community Noise Environments* matrix shown on Exhibit 3-A, provides the City of Vallejo with a planning tool to gauge the compatibility of new sensitive land uses relative to existing and future exterior noise levels. To limit exposure to noise and to minimize adverse effects on sensitive receptors (Policy NBE.515), Table NBE-1 identifies a 60 dBA CNEL as a *normally acceptable* and 70 dBA CNEL as *conditionally acceptable* noise levels for single-family residential land uses impacted by transportation noise sources. According to Table NBE-1, noise levels in excess of *normally acceptable* levels require that *a detailed analysis of the noise reduction requirements must be made and needed noise-insulation features must be included in the design.*

EXHIBIT 3-A: LAND USE COMPATIBILITY FOR COMMUNITY NOISE ENVIRONMENTS

Source: Governor's Office of Planning and Research, General Plan Guidelines, November 2003.

3.4 OPERATIONAL NOISE STANDARDS

To analyze noise impacts originating from the operation of the Project, noise from operational activities are typically limited to the hours of operation established under the Municipal Code. The Municipal Code noise standards for operational sources are described below for the City of

Vallejo to determine the potential noise impacts at the nearby sensitive receiver locations. The operational-related noise standards are summarized in Exhibit 3-B and Exhibit 3-C shows the maximum noise level adjustments by time and type.

The City of Vallejo has established maximum exterior and interior noise levels for Project operational noise sources. Section 16.502.09(C)(2) of the Municipal Code identifies limits on noise levels from operational activities as shown on Exhibits 3-C. The nearest noise-sensitive receivers to the Project site consist of existing single-family residential homes. For single-family residential development, operational exterior noise levels may not exceed 60 dBA during the daytime hours (7:00 a.m. to 10:00 p.m.). (14) The standard limits in Exhibit-B shall be adjusted by 5 decibels for any noise that contains a steady, pure tone such as a whine, screech or hum, or an impulsive sound such as hammering or riveting, or contains music or speech. The City of Vallejo Municipal Code is included in Appendix 3.1.

EXHIBIT 3-B: CITY OF VALLEJO EXTERIOR AND INTERIOR NOISE LIMITS

TABLE 16.502-C: MAXIMUM NOISE LEVEL BY NOISE ZONE			
Noise Zoning districts	Maximum Noise Level in dBA (level not to be exceeded more than 30 minutes in any hour)		Maximum Noise Level in dBA (level not to be exceeded more than 5 minutes in any hour)
	Measured at Property Line or District Boundary	Measured at Any Boundary of a Residential Zone	Between 10 PM and 7AM, Measured at Any Boundary of a Residential Zone
Single-Unit Residential	60	60	-
Multiple-Unit Residential	65	65	-
Commercial and Mixed-Use, Medical, Office	70	60	50 or ambient noise level
Light Industrial	75	65	50 or ambient noise level
General Industrial	75	65	50 or ambient noise level
Public Facilities and Community Use	65	60	50 or ambient noise level
Open Space and Recreational Districts	65	60	50 or ambient noise level

EXHIBIT 3-C: CITY OF VALLEJO MAXIMUM NOISE LEVEL ADJUSTMENT

TABLE 16.502-D : MAXIMUM NOISE LEVEL ADJUSTMENT BY TIME AND TYPE	
TIME AND TYPE OF NOISE	ADJUSTMENT (DECIBELS)
Any type other than construction and related activities between 7 am and 10 pm	+5
Noise of unusual impulsive character (e.g., hammering or drilling)	-5
Noise of unusual periodic character (e.g., hammering or screeching)	-5

3.5 CONSTRUCTION NOISE STANDARDS

To analyze noise impacts originating from the construction of the Project, noise from construction activities are typically limited to the hours of operation established under the Municipal Code. The Municipal Code noise standards for construction are described below for

the City of Vallejo to determine the potential noise impacts at the nearby sensitive receiver locations. The construction-related noise standards are summarized in Exhibit 3-D.

The City of Vallejo has established maximum noise levels for mobile and stationary construction equipment. Table 16.502-E of Section 16.502, Performance Standards, of the Municipal Code identifies limits on noise levels from construction activities as shown on Exhibits 3-C for mobile and stationary equipment. The nearest noise-sensitive receivers to the Project site consist of existing single-family residential homes. For single-family residential development, mobile equipment noise levels may not exceed 80 dBA and stationary equipment noise levels may not exceed 65 dBA during the daytime hours. (14) In addition, the Municipal Code identifies hours during which mobile and stationary equipment may operate, between 7:00 a.m. to 6:00 p.m. weekdays, between 9:00 a.m. to 6:00 p.m. Saturdays, and no activity allowed on Sundays or holidays (City of Vallejo Municipal Code, Section 16.502.099(D)(1). The City of Vallejo Municipal Code is included in Appendix 3.1.

EXHIBIT 3-D: CITY OF VALLEJO CONSTRUCTION NOISE STANDARDS

TABLE 16.502-E: MAXIMUM NOISE LEVEL FOR TEMPORARY CONSTRUCTION ACTIVITY			
Time	RR, RLD	RMD, RHD, NMX, NC	Commercial (Including medical and office) and Industrial
Mobile construction equipment—non-scheduled, intermittent, and short-term for less than 15 days			
Weekdays 7am to 6pm	75 dBA	80 dBA	85 dBA
Saturdays 9am to 6pm	60 dBA	65 dBA	70 dBA
Sundays and legal holidays	None	None	None
Stationary construction equipment			
Weekdays 7am to 6pm	60 dBA	65 dBA	70 dBA
Saturdays 9am to 6pm	60 dBA	65 dBA	70 dBA
Sundays and legal holidays	None	None	None

3.6 CONSTRUCTION VIBRATION STANDARDS

Construction activity can result in varying degrees of ground-borne vibration, depending on the equipment and methods used, distance to the affected structures and soil type. Construction

vibration is generally associated with pile driving and rock blasting. Other construction equipment, such as air compressors, light trucks, hydraulic loaders, etc., generates little or no ground vibration. (9)

To analyze vibration impacts originating from the operation and construction of the Vista Cove, vibration-generating activities are appropriately evaluated against standards established under a City's Municipal Code, if such standards exist. However, City of Vallejo General Plan noise policy NBE-5.14 and Section 16.502.08, Vibration, of the Municipal Code do not identify specific vibration level limits. Therefore, for analysis purposes, the Caltrans *Transportation and Construction Vibration Guidance Manual*, (10 p. 38) Tables 19 and 20 are used in this noise study to assess potential temporary construction-related impacts at adjacent building locations. The construction vibration damage potential criteria include consideration of the building conditions. (5 p. 182) The existing buildings adjacent to the Project site can best be described as "older residential structures" with a maximum acceptable continuous vibration threshold of 0.3 PPV (in/sec). The construction vibration annoyance potential criteria include consideration of the perception of vibration, which indicates a maximum acceptable continuous vibration threshold of 0.1 PPV (in/sec) would be considered strongly perceptible. While vibration impacts are only assessed within structures and temporary annoyance is not generally considered a substantial effect on the environment, for purposes of this analysis, the more conservative 0.1 PPV (in/sec) threshold is used to evaluate potential construction vibration impacts at nearby receivers.

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. (15) 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 Vallejo 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. Table 4-1 shows the significance criteria summary matrix.

4.1 CEQA GUIDELINES NOT FURTHER ANALYZED

The Project site is not located within two miles of an airport or airstrip. The closest major airport is the Buchanan Field Airport and Napa County Airport are located roughly 9.6 miles southeast and northwest, respectively, of the Project site. As such, the Project site would be located outside the 55 dBA CNEL airport noise contour for both airports, and therefore, impacts are considered *less than significant*, and no further noise analysis is conducted in relation to Appendix G to the CEQA Guidelines, Noise Threshold 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.

The FICON guidance provides an established source of criteria to assess the impacts of substantial temporary or permanent increase in ambient noise levels. Based on the FICON criteria, the amount to which a given noise level increase is considered acceptable is reduced when the without Project noise levels are already shown to exceed certain land-use specific exterior noise level criteria. The specific levels are based on typical responses to noise level increases of 5 dBA or *readily perceptible*, 3 dBA or *barely perceptible*, and 1.5 dBA depending on the underlying without Project noise levels for noise-sensitive uses. These levels of increases and their perceived acceptance are consistent with guidance provided by both the Federal Highway Administration (18 p. 9) and Caltrans (19 p. 2_48).

4.3 SIGNIFICANCE CRITERIA SUMMARY

Noise impacts shall be considered significant if any of the following occur as a direct result of the proposed Project. Table 4-1 shows the significance criteria summary matrix.

TABLE 4-1: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Receiving Land Use	Condition(s)	Significance Criteria	
			Daytime	Nighttime
Off-Site	Noise-Sensitive ¹	Residential areas where with project is less than maximum "normally acceptable" level in Exhibit 3-A ²	≥ 5 dBA CNEL Project increase	
		Project exceeds "normally acceptable" level in Exhibit 3-A ²	≥ 3 dBA CNEL Project increase	
	Non-Noise Sensitive ^{1,3}	Ambient ²	≥ 10 dBA CNEL Project increase	
On-Site ³	Noise Sensitive	Exterior Noise Level Standard	60 dBA L _{dn}	
		Interior Noise Level Standard	45 dBA L _{dn}	
Operational	Noise-Sensitive	Residential areas where with project is less than maximum "normally acceptable" level in Exhibit 3-A ²	≥ 5 dBA CNEL Project increase	
		Project exceeds "normally acceptable" level in Exhibit 3-A ²	≥ 3 dBA CNEL Project increase	
		Residential ⁴	60 dBA L _{eq}	
Construction		Noise Level Threshold ⁵	80 dBA L _{eq}	n/a
		Vibration Level Threshold ⁶	0.30 PPV (in/sec)	

¹ FICON, 1992.² City of Vallejo General Plan Action NBE-5.15E.³ City of Vallejo General Plan Nature & Built Environment Element.⁴ City of Vallejo Municipal Code, Section 16.502.09(C)(2) (Appendix 3.1).⁵ City of Vallejo Municipal Code, Section 16.502.09(D)(1) (Appendix 3.1).⁶ Caltrans Transportation and Construction Vibration Manual, April 2020 Table 19.

"Daytime" = 7:00 a.m. - 10:00 p.m.; "Nighttime" = 10:00 p.m. - 7:00 a.m.

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5 EXISTING ON-SITE NOISE LEVELS

To assess the existing noise level environment, noise levels are referenced from the *Propel Vallejo General Plan 2040 and Sonoma Boulevard Specific Plan Draft EIR*. (20) Based on Figure 4.10-1, the Project lies within the 70 dBA CNEL traffic noise contour of I-780. In addition, Table 4.10-13 shows that the freeway segment from Columbus Parkway to Glen Cove Parkway exposes adjacent land uses to 77.7 dBA CNEL at 100 feet from the centerline. However, these noise levels are likely over-exaggerated since they are intended to be used for planning and generally do not consider the actual topography. The background ambient noise levels in the Project study area are considered to be dominated by the transportation-related noise associated with I-780.

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6 TRAFFIC NOISE METHODS AND PROCEDURES

The following section outlines the methods and procedures used to model and analyze the future traffic noise environment.

6.1 FHWA TRAFFIC NOISE PREDICTION MODEL

The estimated roadway noise impacts from vehicular traffic were calculated using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108. (21) The FHWA Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). In California the national REMELs are substituted with the California Vehicle Noise (Calveno) Emission Levels. (22) Adjustments are then made to the REMEL to account for: the roadway classification (e.g., collector, secondary, major or arterial), the roadway active width (i.e., the distance between the center of the outermost travel lanes on each side of the roadway), the total average daily traffic (ADT), the travel speed, the percentages of automobiles, medium trucks, and heavy trucks in the traffic volume, the roadway grade, the angle of view (e.g., whether the roadway view is blocked), the site condition" ("hard" or "soft" relates to the absorption of the ground, pavement, or landscaping), and the percentage of total ADT which flows each hour throughout a 24-hour period.

6.2 ON-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

The on-site roadway parameters, including the ADT volumes used for this analysis, are presented in Table 6-1. Based on the City of Vallejo General Plan Circulation Element Map MTC-3, I-780 is classified as a four (4) lane divided Freeway. (23) Future average daily traffic volumes, shown on Table 6-1, were obtained from the City of Vallejo General Plan Update and Sonoma Boulevard Specific Plan EIR (24), and reflect future long-range traffic conditions needed to assess the on-site traffic noise environment and to identify the appropriate noise mitigation measures that address the worst-case future noise conditions.

Table 6-2 presents the time-of-day vehicle splits by vehicle type and roadway classification, and Table 6-3 presents the total traffic flow distributions (vehicle mixes) used for this analysis (25). The vehicle mix provides the hourly distribution percentages of automobiles, medium trucks, and heavy trucks for input into the FHWA Model based on roadway types. The vehicle splits shown in Table 6-2 are reported as a percentage of the overall percentage.

For the purposes of this analysis, soft site conditions were used to analyze the on-site traffic noise impacts for the Project study area. Soft site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. A conservative -3dBA offset was applied to future 1-780 traffic noise levels to account for shielding of the western and northern portion of the Project site that would be provided by existing knoll, reducing full exposure to 1-780 traffic noise levels. Research by Caltrans has shown that the use of soft site conditions and applying a shielding offset to account for intervening topographic features is appropriate for the application of the FHWA traffic noise prediction model used in this analysis. (26)

TABLE 6-1: ON-SITE ROADWAY PARAMETERS

Roadway Segment	Lanes	Classification ¹	Future ADT Volume ²	Speed (mph) ³	Site Condition
I-780	4	Freeway	80,200	65	15

¹ City of Vallejo General Plan Mobility, Transportation, and Connectivity Element.

² Based on Table 4.14-5 of Propel Vallejo General Plan Update and Sonoma Boulevard Specific Plan Draft EIR, 4.14 Transportation and Traffic.

³ Posted speed limit.

TABLE 6-2: TIME OF DAY VEHICLE SPLITS

Time Period	Vehicle Type		
	Autos	Medium Trucks	Heavy Trucks
Daytime (7am-7pm)	77.5%	84.8%	86.5%
Evening (7pm-10pm)	12.9%	4.9%	2.7%
Nighttime (10pm-7am)	9.6%	10.3%	10.8%
Total:	100.0%	100.0%	100.0%

Source: Fairview at Northgate Project Draft Environmental Impact Report, SCH 2018102007, Appendix I, January 2020.

TABLE 6-3: DISTRIBUTION OF TRAFFIC FLOW BY VEHICLE TYPE (VEHICLE MIX)

Roadway Classification	Total % Traffic Flow ¹			Total
	Autos	Medium Trucks	Heavy Trucks	
I-780	95.62%	2.13%	2.25%	100.00%

¹ Source: Typical Interstate 780 (I-780) vehicle mix.

To predict the future noise environment at each building within the Project site, coordinate information was collected to identify the noise transmission path between the noise source and receiver. The coordinate information is based on the Project site plan showing the location of each building, as shown in Exhibit 1-B. The site plan is used to identify the relationship between the roadway centerline elevation, the pad elevation and the centerline distance to any intervening noise barriers or topography, and the building façade. The exterior noise level impacts were placed five feet above the finished floor elevation at the outdoor living areas and proposed building façades. Second-floor receivers were located 14 feet above the finished floor elevation. Appendix 4-1 shows the scaled site plan.

7 ON-SITE TRANSPORTATION NOISE IMPACTS

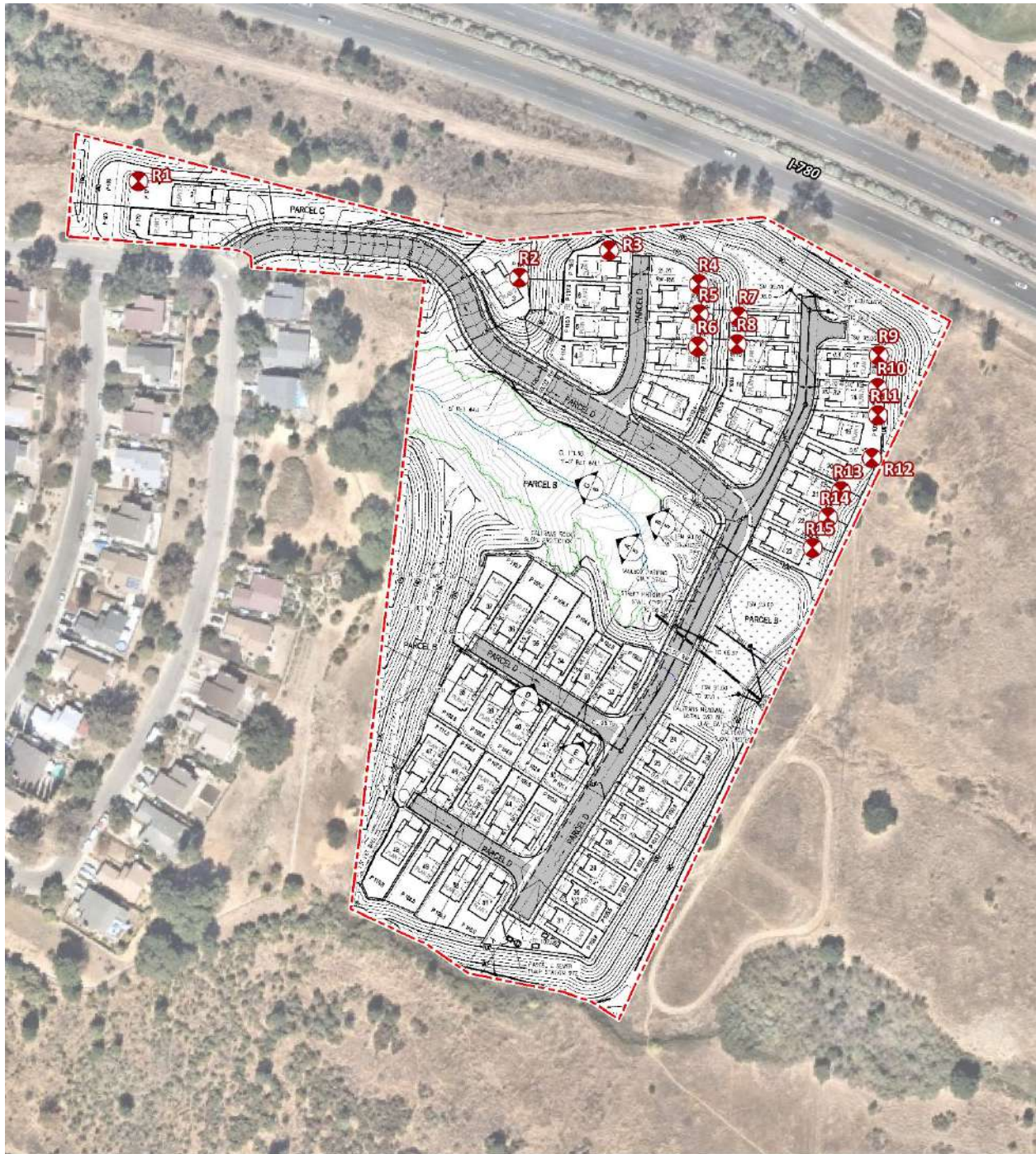
An on-site exterior noise impact analysis has been completed to determine the noise exposure levels that would result from adjacent traffic noise sources in the Project study area, and to identify potential noise control measures that would achieve acceptable Project exterior and interior noise levels. The primary source of traffic noise affecting the Project site is anticipated to be from I-780. The Project will experience some background traffic noise from the Project's internal local streets, however, due to low traffic volume/speed, traffic noise from these roads will not make a significant contribution to the noise environment. Modeled receiver locations are shown in Exhibit 7-A.

7.1 EXTERIOR NOISE ANALYSIS

Using the FHWA traffic noise prediction model and the parameters outlined in Tables 6-1 to 6-3, the expected future exterior noise levels were calculated at the private outdoor living spaces (backyards) and at the residential building façades. Table 7-1 presents a summary of future exterior noise levels at the private outdoor living spaces (backyards) and at the residential building façades. The on-site transportation analysis indicates that the unmitigated exterior noise levels for on-site receivers are estimated to range from 46.5 to 68.8 dBA CNEL. The Exterior traffic noise analysis calculations are provided in Appendix 7.1.

To satisfy the City of Vallejo exterior noise level standard of 60 dBA L_{dn} for single-family residential land uses, the construction of a noise barrier is recommended for the outdoor living area (backyards) of Lots 3, 7 through 9, 16, and 17 through 20, adjacent to I-780. Specifically, a minimum 4-foot-high noise barrier is recommended for Lot 9, 5-foot minimum height barriers for Lots 8, 16, and 18 through 20, and 6-foot minimum height barriers for Lots 3, 7, and 9. With the recommended noise barriers shown in Exhibit ES-A, the future exterior noise levels will range from 46.5 to 60.0 dBA CNEL. This noise analysis shows that the recommended noise barrier will satisfy the City of Vallejo exterior noise level standards for residential land uses adjacent to I-780. The effective noise barrier height recommendations represent the minimum wall and/or berm combination height required to satisfy the City of Vallejo exterior noise level standards. As such, the future on-site traffic noise impacts at the private outdoor living spaces (backyards) are considered *less than significant* impacts.

EXHIBIT 7-A: ON-SITE RECEIVER LOCATIONS



LEGEND:

- On-site Recievers
- Site Boundary

TABLE 7-1: EXTERIOR TRAFFIC NOISE LEVELS (DBA CNEL)

Receiver Number ¹	Lot Number	Source	Unmitigated Noise Level (dBA CNEL)	Mitigated Noise Level (dBA CNEL)	Barrier Height (Feet)	Does the Project exceed the exterior limit?
R01	2	I-780	46.5	46.1	0.0	No
R02	3	I-780	61.2	59.7	6.0	No
R03	7	I-780	66.4	59.9	6.0	No
R04	8	I-780	68.3	58.9	5.0	No
R05	9	I-780	62.3	55.7	4.0	No
R06	10	I-780	59.1	54.1	0.0	No
R07	16	I-780	60.9	56.0	5.0	No
R08	15	I-780	57.1	54.0	0.0	No
R09	17	I-780	68.8	57.6	6.0	No
R10	18	I-780	66.1	57.3	5.0	No
R11	19	I-780	64.6	57.2	5.0	No
R12	20	I-780	62.1	60.0	5.0	No
R13	21	I-780	57.3	58.6	0.0	No
R14	22	I-780	53.0	54.8	0.0	No
R15	23	I-780	49.5	48.9	0.0	No

Bold numbers indicate an exceedance of the standard.

¹ See Exhibit 5-A for the analysis locations.

² Exterior noise calculations are included in Appendix 7.1.

7.2 INTERIOR NOISE ANALYSIS

To ensure that the interior noise levels comply with the City of Vallejo interior noise level standard of 45 dBA CNEL, future noise levels were calculated at the estimated building façade locations. It should be noted that Project architectural plans are unavailable and the Project should provide a final interior noise analysis as part of the plan check process.

7.2.1 NOISE REDUCTION METHODOLOGY

The interior noise level is the difference between the predicted exterior noise level at the building facade and the noise reduction of the structure. Typical building construction will provide a Noise Reduction (NR) of approximately 12 dBA with "windows open" and a minimum 25 dBA noise reduction with "windows closed." (3) However, sound leaks, cracks and openings within the window assembly can greatly diminish its effectiveness in reducing noise. Several methods are used to improve interior noise reduction, including: (1) weather-stripped solid core exterior doors; (2) upgraded dual glazed windows; (3) mechanical ventilation/air conditioning; and (4) exterior wall/roof assemblies free of cut outs or openings.

7.2.2 INTERIOR NOISE LEVEL ASSESSMENT

Tables 7-2 to 7-3 show that the buildings adjacent to I-780 will experience future unmitigated noise levels ranging from 46.1 to 60.0 dBA CNEL at first-floor building façades and 51.3 to 69.9 dBA CNEL at second-floor building façades.

The interior noise level analysis shows that the City of Vallejo 45 dBA CNEL interior noise standard can be satisfied at most locations with no requirements, with a windows closed condition and a means of mechanical ventilation (e.g., air conditioning). Therefore, standard construction without upgraded windows or doors will comply with the City of Vallejo interior noise level standard of 45 dBA CNEL.

TABLE 7-2: FIRST-FLOOR INTERIOR TRAFFIC NOISE IMPACTS (CNEL)

Receiver Number	Noise Level at Façade ¹	Required Interior NR ²	Estimated Interior NR ³	Upgraded Windows ⁴	Interior Noise Level ⁵	Threshold	Threshold Exceeded?
R01	46.1	1.1	25.0	No	21.1	45.0	No
R02	59.7	14.7	25.0	No	34.7	45.0	No
R03	59.9	14.9	25.0	No	34.9	45.0	No
R04	58.9	13.9	25.0	No	33.9	45.0	No
R05	55.7	10.7	25.0	No	30.7	45.0	No
R06	54.1	9.1	25.0	No	29.1	45.0	No
R07	56.0	11.0	25.0	No	31.0	45.0	No
R08	54.0	9.0	25.0	No	29.0	45.0	No
R09	57.6	12.6	25.0	No	32.6	45.0	No
R10	57.3	12.3	25.0	No	32.3	45.0	No
R11	57.2	12.2	25.0	No	32.2	45.0	No
R12	60.0	15.0	25.0	No	35.0	45.0	No
R13	58.6	13.6	25.0	No	33.6	45.0	No
R14	54.8	9.8	25.0	No	29.8	45.0	No
R15	48.9	3.9	25.0	No	23.9	45.0	No

¹ Exterior noise level at the facade with a windows closed condition requiring a means of mechanical ventilation (e.g. air conditioning).

² Noise reduction required to satisfy the 45 dBA CNEL interior noise standards.

³ Estimated minimum interior noise reduction.

⁴ Does the required interior noise reduction trigger upgraded with a minimum STC rating of greater than 27?

⁵ Estimated interior noise level with minimum STC rating for all windows.

"NR" = Noise reduction

TABLE 7-3: SECOND-FLOOR INTERIOR TRAFFIC NOISE IMPACTS (CNEL)

Receiver Number	Noise Level at Façade ¹	Required Interior NR ²	Estimated Interior NR ³	Upgraded Windows ⁴	Interior Noise Level ⁵	Threshold	Threshold Exceeded?
R01	51.3	6.3	25.0	No	26.3	45.0	No
R02	64.1	19.1	25.0	No	39.1	45.0	No
R03	68.7	23.7	25.0	No	43.7	45.0	No
R04	69.5	24.5	25.0	No	44.5	45.0	No
R05	66.8	21.8	25.0	No	41.8	45.0	No
R06	63.3	18.3	25.0	No	38.3	45.0	No
R07	66.4	21.4	25.0	No	41.4	45.0	No
R08	62.0	17.0	25.0	No	37.0	45.0	No
R09	69.9	24.9	25.0	No	44.9	45.0	No
R10	68.2	23.2	25.0	No	43.2	45.0	No
R11	66.6	21.6	25.0	No	41.6	45.0	No
R12	64.3	19.3	25.0	No	39.3	45.0	No
R13	60.2	15.2	25.0	No	35.2	45.0	No
R14	58.1	13.1	25.0	No	33.1	45.0	No
R15	55.7	10.7	25.0	No	30.7	45.0	No

¹ Exterior noise level at the facade with a windows closed condition requiring a means of mechanical ventilation (e.g. air conditioning).

² Noise reduction required to satisfy the 45 dBA CNEL interior noise standards.

³ Estimated minimum interior noise reduction.

⁴ Does the required interior noise reduction trigger upgraded with a minimum STC rating of greater than 27?

⁵ Estimated interior noise level with minimum STC rating for all windows.

"NR" = Noise reduction

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8 OFF-SITE TRANSPORTATION NOISE IMPACTS

The expected Project is anticipated to generate approximately 510 trips per day. The location where the greatest chance of an impact occurs is at the residence near the Project site entrance and at Shady Lane and Wildflower Avenue. Assuming a typical speed of 25 mph, a predominately automobile traffic mix, and without no barriers, the Project is predicted to generate a noise level of 50.2 dBA CNEL at the nearest building façade of 196 Wildflower Avenue. Therefore, the Project would not expose existing noise-sensitive receivers to excessive noise levels, and the off-site traffic noise level impacts due to the Project are considered *less than significant*.

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9 SENSITIVE RECEIVER LOCATIONS

To assess the potential for long-term operational and short-term construction noise impacts, the following sensitive receiver locations, as shown on Exhibit 9-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, outpatient 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, undeveloped land, parking lots, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals.

To describe the potential off-site Project noise levels, six receiver locations in the vicinity of the Project site were identified. All distances are measured from the Project site boundary to the outdoor living areas (e.g., private backyards) or at the building façade, whichever is closer to the Project site. The selection of receiver locations is based on FHWA guidelines and is consistent with additional guidance provided by Caltrans and the FTA, as previously described in Section 5.2. 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. Distance is measured in a straight line from the project boundary to each receiver location.

- R1: Location R1 represents existing noise sensitive single-family residence at 190 Buckeye Lane, approximately 90 feet southwest of the Project site. Receiver R1 is placed near the private outdoor living area (backyard) facing the Project site.
- R2: Location R2 represents the existing noise sensitive single-family residence at 180 Ironwood Lane, approximately 80 feet south of the Project site. Receiver R2 is placed near the private outdoor living area (backyard) facing the Project site.
- R3: Location R3 represents the existing noise sensitive single-family residence at 196 Shady Lane, approximately 30 feet south of the Project site. Receiver R3 is placed near the private outdoor living area (backyard) facing the Project site.
- R4: Location R4 represents the existing noise sensitive single-family residence at 156 Wildflower Avenue, approximately 114 feet west of the Project site. Receiver R4 is placed near the private outdoor living area (backyard) facing the Project site.
- R5: Location R5 represents the existing noise sensitive single-family residence at 124 Shady Lane, approximately 188 feet west of the Project site. Receiver R5 is placed near the private outdoor living area (backyard) facing the Project site.
- R6: Location R6 represents the existing noise sensitive Saint Patrick Saint Vincent High School at 1500 Benicia Road and the multi-family uses to the east of the school, approximately 339 feet north of the Project site. Receiver R6 is representative of an outdoor area and the building façade, in terms of distance.

EXHIBIT 8-A: RECEIVER LOCATIONS



LEGEND:

N

Site Boundary

Receiver Locations

Distance from receiver to Project site boundary (in feet)

10 OPERATIONAL NOISE IMPACTS

This section analyzes the potential stationary-source operational noise impacts at the nearest receiver locations, identified in Section 9, resulting from the operation of the proposed Vista Cove Project. Exhibit 10-A identifies the representative noise source locations used to assess the operational noise levels.

10.1 OPERATIONAL NOISE SOURCES

This operational noise analysis is intended to describe noise level impacts associated with the expected typical of daytime and nighttime activities at the Project site. To present the potential worst-case noise conditions, this analysis assumes the Project would be operational 24 hours per day, seven days per week. The on-site Project-related noise sources are expected to include: air conditioning units.

AIR CONDITIONING UNITS

To assess the noise levels created by the air conditioning units, reference noise levels were taken from equipment specifications for a 3-ton residential packaged air conditioning unit (Carrier Model: R4A4S18AKANA). Each air conditioning unit was modeled as operating 60 minutes per hour during the daytime and nighttime. For this noise analysis, the air conditioning units are expected to be ground-mounted adjacent to the proposed buildings. The air conditioning units are anticipated to be located 3 feet above the ground level. According to the manufacturer's specification sheets, the Carrier R4A4S18AKANA generates a maximum sound power level of 76 dBA L_w for 4 to 5-ton units or approximately 44.4 dBA L_{max} at 50 feet.

10.2 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 in Table 10-1 used to estimate the Project operational noise impacts. These sources of noise activity will likely vary throughout the day.

TABLE 10-1: REFERENCE NOISE LEVELS

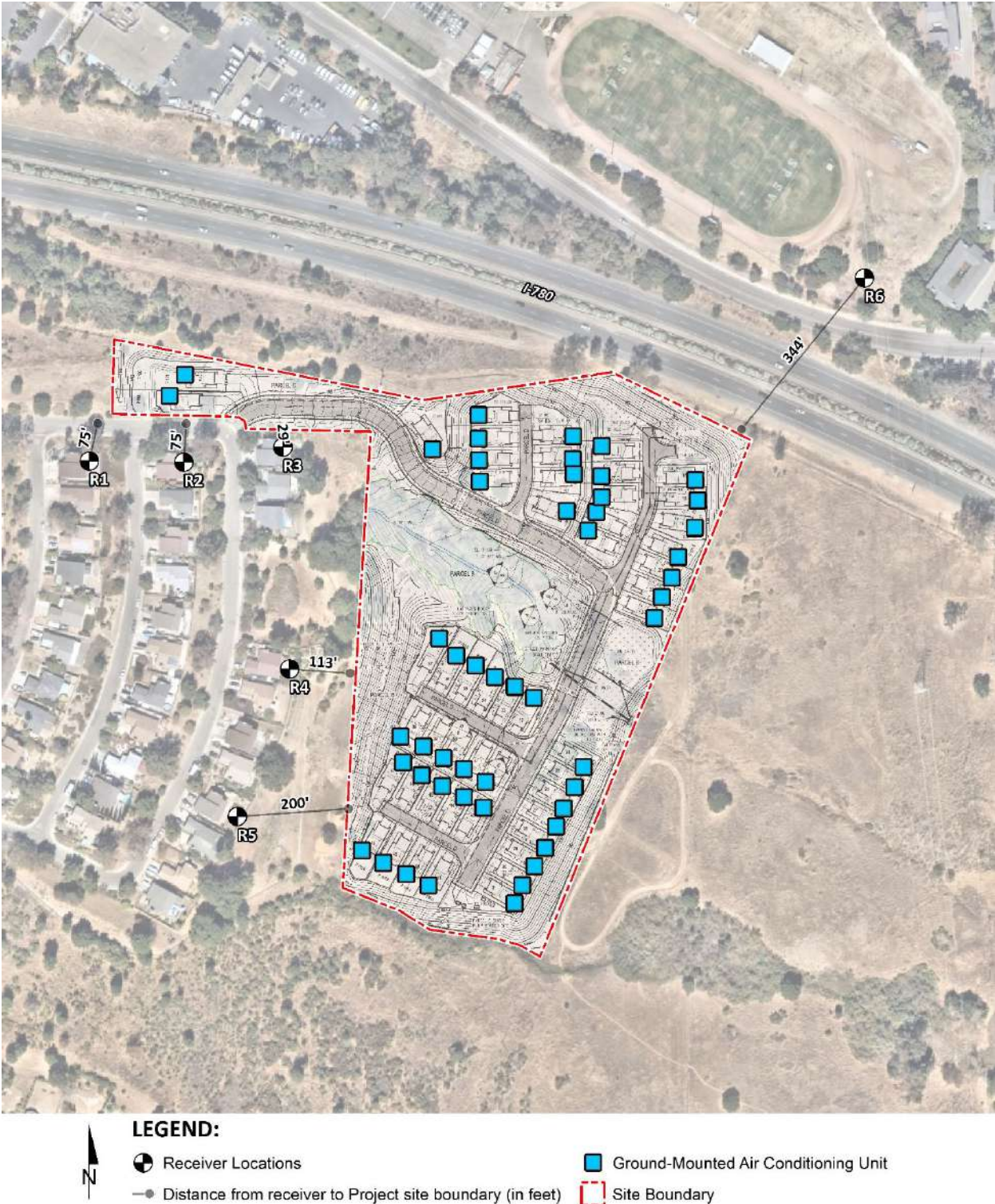
Noise Source	Noise Source Height (Feet)	Min./Hour ²		Reference Noise Level (dBA L_{eq}) '@ 50 Feet	Sound Power Level (dBA) ³
		Day	Night		
Air Conditioning Units ¹	3'	60	60	44.4	76.0

¹ Carrier Model R4A4S18AKANA, Appendix 10.1.

² Anticipated duration (minutes within the hour) of noise activity during typical hourly conditions expected at the Project site. "Daytime" = 7:00 a.m. - 10:00 p.m.; "Nighttime" = 10:00 p.m. - 7:00 a.m.

³ Sound power level represents the total amount of acoustical energy (noise level) produced by a sound source independent of distance or surroundings. Sound power levels calculated using the CadnaA noise model at the reference distance to the noise source.

EXHIBIT 9-A: OPERATIONAL NOISE SOURCE LOCATIONS



10.3 CADNA A NOISE PREDICTION MODEL

To fully describe the exterior operational noise levels from the Project, Urban Crossroads, Inc. developed a noise prediction model using the CadnaA (Computer Aided Noise Abatement) computer program. CadnaA can analyze multiple types of noise sources using the spatially accurate Project site plan, georeferenced Nearmap aerial imagery, topography, buildings, and barriers in its calculations to predict outdoor noise levels.

Using the ISO 9613 protocol, CadnaA will calculate the distance from each noise source to the noise receiver locations, using the ground absorption, distance, and barrier/building attenuation inputs to provide a summary of noise level at each receiver and the partial noise level contributions by noise source. Consistent with the ISO 9613 protocol, the CadnaA noise prediction model relies on the reference sound power level (L_w) to describe individual noise sources. While sound pressure levels (e.g., L_{eq}) quantify in decibels the intensity of given sound sources at a reference distance, sound power levels (L_w) are connected to the sound source and are independent of distance. Sound pressure levels vary substantially with distance from the source and diminish because of intervening obstacles and barriers, air absorption, wind, and other factors. Sound power is the acoustical energy emitted by the sound source and is an absolute value that is not affected by the environment.

The operational noise level calculations provided in this noise study 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. A default ground attenuation factor of 0.5 was used in the CadnaA noise analysis to account for mixed ground representing a combination of hard and soft surfaces. Appendix 10.1 includes the detailed noise model inputs used to estimate the Project operational noise levels presented in this section.

10.4 PROJECT OPERATIONAL NOISE LEVELS

Using the reference noise levels to represent the proposed Project operations that include air conditioning units, 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. Table 10-2 shows the Project operational noise levels during the daytime hours of 7:00 a.m. to 10:00 p.m. The daytime hourly noise levels at the off-site receiver locations are expected to range from 24.6 to 34.3 dBA L_{eq} .

TABLE 10-2: PROJECT OPERATIONAL NOISE LEVELS

Noise Source ¹	Operational Noise Levels by Receiver Location (dBA Leq)					
	R1	R2	R3	R4	R5	R6
Air Conditioning Units	29.8	32.5	29.7	31.6	33.3	23.7
Total (All Noise Sources)	29.8	32.5	29.7	31.6	33.3	23.7

¹ See Exhibit 10-A for the noise source locations. CadnaA noise model calculations are included in Appendix 10.2.

10.5 PROJECT OPERATIONAL NOISE LEVEL COMPLIANCE

To demonstrate compliance with local noise regulations, the Project-only operational noise levels are evaluated against exterior noise level thresholds based on the City of Vallejo exterior noise level standards at nearby noise-sensitive receiver locations. Table 10-4 shows the operational noise levels associated with Vista Cove Project will satisfy the City of Vallejo daytime 60 dBA L_{eq} and nighttime 50 dBA L_{eq} exterior noise level standards at all nearby noise sensitive receiver locations. Therefore, the operational noise impacts are considered *less than significant* at the nearby noise-sensitive receiver locations.

TABLE 10-4: OPERATIONAL NOISE LEVEL COMPLIANCE

Receiver Location ¹	Project Operational Noise Levels (dBA L_{eq}) ²	Noise Level Standards (dBA L_{eq}) ³		Noise Level Standards Exceeded? ⁴	
		Daytime	Nighttime	Daytime	Nighttime
R1	29.8	60	50	No	No
R2	32.5	60	50	No	No
R3	29.7	60	50	No	No
R4	31.6	60	50	No	No
R5	33.3	60	50	No	No
R6	23.7	60	50	No	No

¹ See Exhibit 9-A for the receiver locations.

² Proposed Project operational noise levels as shown in Tables 10-2 and 10-3.

³ Exterior noise level standards for source (residential) land use, as shown in Table 4-1.

⁴ Do the estimated Project operational noise source activities exceed the noise level standards?

"Daytime" = 7:00 a.m. - 10:00 p.m.; "Nighttime" = 10:00 p.m. - 7:00 a.m.

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11 CONSTRUCTION IMPACTS

This section analyzes potential impacts resulting from the short-term construction activities associated with the development of the Project. Exhibit 11-A shows the construction noise source locations in relation to the nearby sensitive receiver locations previously described in Section 9.

11.1 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:

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

11.2 CONSTRUCTION REFERENCE NOISE LEVELS

To describe peak construction noise activities, this construction noise analysis was prepared using reference noise level measurements published in the *Update of Noise Database for Prediction of Noise on Construction and Open Sites* by the Department for Environment, Food and Rural Affairs (DEFRA). (27). The DEFRA database provides the most recent and comprehensive source of reference construction noise levels. Table 11-1 provides a summary of the DEFRA construction reference noise level measurements expressed in hourly average dBA L_{eq} using the estimated FHWA Roadway Construction Noise Model (RCNM) usage factors (28) to describe the typical construction activities for each stage of Project construction.

EXHIBIT 11-A: CONSTRUCTION ACTIVITY



LEGEND:

 Construction Activity
  Receiver Locations
  Distance from receiver to construction activity (in feet)

TABLE 11-1: TYPICAL CONSTRUCTION REFERENCE NOISE LEVELS

Construction Stage	Reference Construction Equipmnet ¹	Reference Noise Level @ 50 Feet (dBA L _{eq})	Composite Reference Noise Level (dBA L _{eq})	Reference Power Level (dBA L _w)
Site Preparation	Dozer	78.0	83.4	115.1
	Front End Loader	75.0		
	Grader	81.0		
Grading	Excavator	77.0	84.0	115.6
	Tractor	80.0		
	Scraper	80.0		
Building Construction	Crane	73.0	77.4	109.1
	Backhoe	74.0		
	Generator (<25kVA)	70.0		
Paving	Paver	74.0	77.8	109.5
	Dump Truck	72.0		
	Roller	73.0		
Architectural Coating	Man Lift	68.0	76.2	107.8
	Compressor (air)	74.0		
	Generator (<25kVA)	70.0		

¹ FHWA Road Construction Noise Model.

11.3 CADNA A NOISE PREDICTION MODEL

To fully describe the construction noise levels from the Project, Urban Crossroads, Inc. developed a noise prediction model using the CadnaA (Computer Aided Noise Abatement) computer program. CadnaA can analyze multiple types of noise sources using the spatially accurate Project site plan, georeferenced Nearmap aerial imagery, topography, buildings, and barriers in its calculations to predict outdoor noise levels.

Using the ISO 9613 protocol, CadnaA will calculate the distance from each noise source to the noise receiver locations, using the ground absorption, distance, and barrier/building attenuation inputs to provide a summary of noise level at each receiver and the partial noise level contributions by noise source. Consistent with the ISO 9613 protocol, the CadnaA noise prediction model relies on the reference sound power level (L_w) to describe individual noise sources. While sound pressure levels (e.g., L_{eq}) quantify in decibels the intensity of given sound sources at a reference distance, sound power levels (L_w) are connected to the sound source and are independent of distance. Sound pressure levels vary substantially with distance from the source and diminish because of intervening obstacles and barriers, air absorption, wind, and other factors. Sound power is the acoustical energy emitted by the sound source and is an absolute value that is not affected by the environment.

The construction noise level calculations provided in this noise study 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. A default ground attenuation factor of 0.5 was used in the noise analysis to account for mixed ground representing a combination of hard and soft surfaces.

11.4 TYPICAL CONSTRUCTION NOISE ANALYSIS

Using the reference construction equipment noise levels and the CadnaA noise prediction model, calculations of the Project construction noise level impacts at the nearest sensitive receiver locations were completed. To assess the worst-case construction noise levels, the Project construction noise analysis relies on the highest noise level impacts when the equipment with the highest reference noise level is operating at the closest point from the edge of primary construction activity (Project site boundary) to each receiver location. As shown on Table 11-2, the construction noise levels are expected to range from 45.5 to 65.0 dBA L_{eq} , and the highest construction levels are expected to range from 53.3 to 65.0 dBA L_{eq} at the nearest receiver locations. Appendix 11.1 includes the detailed CadnaA construction noise model inputs.

TABLE 11-2: TYPICAL CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

Receiver Location ¹	Construction Noise Levels (dBA L_{eq})					
	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Levels ²
R1	58.8	59.3	52.7	53.2	51.5	59.3
R2	61.3	61.8	55.2	55.7	54.0	61.8
R3	64.5	65.0	58.4	58.9	57.2	65.0
R4	59.6	60.1	53.5	54.0	52.3	60.1
R5	58.9	59.4	52.8	53.3	51.6	59.4
R6	52.8	53.3	46.7	47.2	45.5	53.3

¹ Noise receiver locations are shown in Exhibit 11-A.

² Construction noise level calculations based on distance from the construction activity, which is measured from the Project site boundary to the nearest receiver locations. CadnaA construction noise model inputs are included in Appendix 11.1.

11.5 TYPICAL CONSTRUCTION NOISE LEVEL COMPLIANCE

To evaluate whether the Project will generate potentially significant short-term noise levels at nearest receiver locations, a construction-related daytime noise level threshold of 80 dBA L_{eq} is used as a reasonable threshold to assess the daytime construction noise level impacts. The construction noise analysis shows that the nearest receiver locations will satisfy the reasonable daytime 80 dBA L_{eq} significance threshold during Project construction activities as shown on Table 11-3. Therefore, the noise impacts due to Project construction noise is considered *less than significant* at all receiver locations.

TABLE 11-3: TYPICAL CONSTRUCTION NOISE LEVEL COMPLIANCE

Receiver Location ¹	Construction Noise Levels (dBA L _{eq})		
	Highest Construction Noise Levels ²	Threshold ³	Threshold Exceeded? ⁴
R1	59.3	80	No
R2	61.8	80	No
R3	65.0	80	No
R4	60.1	80	No
R5	59.4	80	No
R6	53.3	80	No

¹ Noise receiver locations are shown in Exhibit 11-A.

² Highest construction noise level calculations based on distance from the construction noise source activity to the nearest receiver locations.

³ Construction noise level thresholds as shown in Table 4-1.

⁴ Do the estimated Project construction noise levels exceed the construction noise level threshold?

11.6 TYPICAL 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. Ground-borne vibration levels resulting from typical construction activities occurring within the Project site were estimated by data published by the Federal Transit Administration (FTA). (26) 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 11-4. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the potential Project construction vibration levels using the following vibration assessment methods defined by Caltrans. To describe the human response (annoyance) associated with vibration impacts Caltrans provides the following equation: $PPV_{\text{equip}} = PPV_{\text{ref}} \times (25/D)^{1.1}$

TABLE 11-4: 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

Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual

Using the vibration source level of construction equipment provided on Table 11-4 and the construction vibration assessment methodology published by the FTA, it is possible to estimate the Project vibration impacts. Table 11-5 presents the expected Project related vibration levels at the nearby receiver locations. At distances ranging from 29 to 344 feet from the Project construction activities to the nearest adjacent off-site structure, construction vibration velocity levels are estimated to range from less than 0.02 to 0.07 in/sec PPV. Based on maximum acceptable continuous vibration threshold of 0.10 in/sec PPV, the typical Project construction vibration levels will not exceed the vibration thresholds at any local receiver. Additionally, since the vibration levels would be well below 0.30 in/sec PPV, there would be no structural vibration impacts. Therefore, the Project-related vibration impacts associated with construction activities are considered *less than significant*.

TABLE 11-5: PROJECT CONSTRUCTION VIBRATION LEVELS

Receiver Location ¹	Distance to Const. Activity (Feet) ²	Typical Construction Vibration Levels PPV (in/sec) ³					Thresholds PPV (in/sec) ⁴	Thresholds Exceeded? ⁵
		Small bulldozer	Jack- hammer	Loaded Trucks	Large Bulldozer	Highest Vibration Level		
R1	90'	0.00	0.01	0.02	0.02	0.02	0.10	No
R2	80'	0.00	0.01	0.02	0.02	0.02	0.10	No
R3	30'	0.00	0.03	0.06	0.07	0.07	0.10	No
R4	114'	0.00	0.01	0.01	0.02	0.02	0.10	No
R5	188'	0.00	0.00	0.01	0.01	0.01	0.10	No
R6	339'	0.00	0.00	0.00	0.01	0.01	0.10	No

¹ Construction receiver locations are shown in Exhibit 11-A.

² Distance from receiver location to Project construction boundary.

³ Based on the Vibration Source Levels of Construction Equipment (Table 11-4).

⁴ Construction vibration level thresholds as shown in Table 4-1.

⁵ Does the peak vibration exceed the acceptable vibration thresholds?

"PPV" = Peak Particle Velocity

12 REFERENCES

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13 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed Vista Cove 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 (619) 788-1971.

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EDUCATION

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PROFESSIONAL AFFILIATIONS

ASA – Acoustical Society of America
AEP – Association of Environmental Planners
AWMA – Air and Waste Management Association
INCE – Institute of Noise Control Engineers

PROFESSIONAL CERTIFICATIONS

Approved Acoustical Consultant • County of San Diego
FHWA Traffic Noise Model of Training • November 2004
CadnaA Basic and Advanced Training Certificate • October 2008.

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APPENDIX 3.1:

CITY OF VALLEJO MUNICIPAL CODE

APPENDIX 3.1:

CITY OF VALLEJO MUNICIPAL CODE

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16.502.08 - Vibration.

No use shall be operated in a manner that produces vibrations discernible without instruments at any point on the property line of the lot on which the use is located.

16.502.09 - Noise.

A. Purpose. The purpose of these regulations is to implement the general plan policies on noise exposure and land use compatibility policies. More specifically, the purpose of the noise standards is to:

1. Establish the principles and context for the application of noise limits, standards for noise exposure and land use compatibility, and requirements for reasonable noise attenuation measures;
2. Protect noise sensitive uses from excessive noise exposure from other uses;
3. Establish regulations for maximum noise limits and procedures for enforcing them
4. Prevent any land use from generating sound that exceeds specific maximum levels based on the type uses and the type of noise.

B. Exemptions. The following facilities and uses are exempt from these regulations:

1. Emergencies. The emission of sound for the purpose of alerting persons to the existence of an emergency, the performance of emergency work, or the operation of emergency equipment including, but not limited to, generators.
2. Warning Devices. Warning devices necessary for the protection of the public safety, such as police, fire, and ambulance sirens.
3. Special Events. Occasional outdoor gatherings, public dances, shows, and sporting and entertainment events, provided that such events are conducted pursuant to a permit or license issued by the city.
4. Religious Institutions and Other Similar Organizations. Unamplified bells, chimes, or other similar devices used by religious institutions and other houses of religious worship.
5. Time signals. Signals produced by places of employment or worship and school recess signals providing no one sound exceeds five seconds in duration and no one series of sounds exceeds twenty-four seconds in duration.
6. Municipal Solid Waste Collection. Collection of solid waste, vegetative waste, and recyclable materials by the city or under contract with the city.
7. Public Works Construction Projects, Maintenance, and Repair. Street, utility, and similar construction projects undertaken by or under contract to or direction of the city, or the state of California or a public utility regulated by the California Public Utilities Commission,

as well as maintenance and repair operations conducted by such parties, including street sweeping, debris and litter removal, removal of downed wires, restoring electrical service, repairing traffic signals, unplugging sewers, vacuuming catch basins, repairing of damaged poles, removal of abandoned vehicles, repairing of water hydrants and mains, gas lines, oil lines, sewers, storm drains, roads, and sidewalks.

8. Transportation equipment. Sounds from transportation equipment such as trucks and buses used primarily in the movement of goods and people to and from given premises and in connection with temporary construction or demolition work.
9. Utility Facilities. Facilities including without limitation sixty-cycle electric power transformers and related equipment, sewer lift stations, municipal wells, and pumping stations.

C. General Requirements.

1. No person shall make, or cause to suffer, or permit to be made upon any public property, public right-of-way or private property, any excessive noise, annoying noise, amplified sound or vibrations that are physically annoying to reasonable persons of normal sensitivity or that are so harsh or so prolonged or unnatural or unusual in their use, time or place as to cause or contribute to the unnecessary and unreasonable discomfort of any persons of normal sensitivity located at the lot line of the property from which these noises emanate or that interfere with the peace and comfort of residents or their guests, or the operators or customers in places of business in the vicinity, or that may detrimentally or adversely affect such residences or places of business.
2. Noise standards. Table 16.502-C classifies uses and facilities and establishes exterior and interior noise standards applicable to all uses and facilities in each classification that is not exempt from these requirements pursuant to Subsection B. The requirements impose limits on regularly occurring noise for the specified time periods, averaged over an hour, and do not apply to incidental, infrequent, or unexpected noise, which are subject to Vallejo Municipal Code [Chapter 7.84](#), Regulations of Noise Disturbances. The prohibitions contained in Municipal Code [Chapter 7.84](#), apply to all land uses and activities in the city, and, in the case of a conflict, the more restrictive provisions apply.

TABLE 16.502-C: MAXIMUM NOISE LEVEL BY NOISE ZONE		
Noise Zoning districts	Maximum Noise Level in dBA (level not to be exceeded more than 30 minutes in any hour)	Maximum Noise Level in dBA (level not to be exceeded more than 5 minutes in any hour)

	Measured at Property Line or District Boundary	Measured at Any Boundary of a Residential Zone	Between 10 PM and 7AM, Measured at Any Boundary of a Residential Zone
Single-Unit Residential	60	60	-
Multiple-Unit Residential	65	65	-
Commercial and Mixed-Use, Medical, Office	70	60	50 or ambient noise level
Light Industrial	75	65	50 or ambient noise level
General Industrial	75	65	50 or ambient noise level
Public Facilities and Community Use	65	60	50 or ambient noise level
Open Space and Recreational Districts	65	60	50 or ambient noise level

3. The standard limits in Table 16.502-D shall be adjusted by five decibels for any noise that contains a steady, pure tone such as a whine, screech or hum, or an impulsive sound such as hammering or riveting, or contains music or speech, as described in the following table.

TABLE 16.502-D: MAXIMUM NOISE LEVEL ADJUSTMENT BY TIME AND TYPE	
TIME AND TYPE OF NOISE	ADJUSTMENT (DECIBELS)

Any type other than construction and related activities between 7 am and 10 pm	+5
Noise of unusual impulsive character (e.g., hammering or drilling)	-5
Noise of unusual periodic character (e.g., hammering or screeching)	-5

D. Additional Regulations. In addition to the following restrictions, hours may be modified with condition imposed by any conditional use permit or variance. The most restrictive hours shall apply.

1. Construction hours. Construction, demolition, and related loading/unloading activities that may generate noise exceeding levels in Table 16.502.E shall be limited to hours between 7:00 a.m. and 7:00 p.m. in residential zoning districts and in any mixed-use district.

TABLE 16.502-E: MAXIMUM NOISE LEVEL FOR TEMPORARY CONSTRUCTION ACTIVITY			
Time	RR, RLD	RMD, RHD, NMX, NC	Commercial (Including medical and office) and Industrial
Mobile construction equipment—non-scheduled, intermittent, and short-term for less than 15 days			
Weekdays 7 a.m. to 6 p.m.	75 dBA	80 dBA	85 dBA
Saturdays 9 a.m. to 6 p.m.	60 dBA	65 dBA	70 dBA
Sundays and legal holidays	None	None	None
Stationary construction equipment			
Weekdays 7 a.m. to 6 p.m.	60 dBA	65 dBA	70 dBA

Saturdays 9 a.m. to 6 p.m.	60 dBA	65 dBA	70 dBA
Sundays and legal holidays	None	None	None

2. Noise measurement. In determining whether any noise exceeds the maximum exterior noise limits set forth in this chapter, measurements shall be taken at the property line of the property from which the noise emanates, except that for noise emanating from property in a IG Zoning District, measurement shall be taken at boundary of the zoning district in which the property is located. Residential noise levels.
 - a. Interior. No person shall operate or cause to be operated within a dwelling unit, any source of sound that causes the sound level when measured inside a neighboring receiving dwelling unit to exceed the allowable noise level, for any period of time.
 - b. Exterior. The exterior noise limits for any source of noise within any residential zone shall be reduced by ten dBA between 10:00 p.m. and 7:00 a.m. The exterior noise limits for any source of noise in any zone other than a residential zone shall be reduced between 10:00 p.m. and 7:00 a.m. so that when the noise measured at the property line of a "noise-sensitive use" does not exceed fifty dBA. The interior noise level for steady state continuous noise from exterior sources in any residential bedroom with windows open between 10:00 p.m. and 7:00 a.m. shall not exceed thirty dBA.
 - c. Mitigation required. New single-unit residential projects shall be located and designed so the noise levels in private use areas does not exceed sixty Ldn. For new multiple-unit residential projects a standard of sixty-five Ldn shall apply to outdoor areas excluding balconies.
 - d. Noise from sources not under local jurisdiction such as freeways and aircraft shall be exempt.
 - e. Developers of mixed-use projects that include residential development shall notify all potential residents that they may be exposed to noise from adjacent and nearby commercial, retail, entertainment, and circulation activity.
- E. Noise level measurement. The following provisions establish a means for measuring noise levels. Where these provisions conflict with other requirements of the Vallejo Municipal Code, the following shall remain applicable for purposes of the Zoning Code:
 1. Setting of Meter. Any sound or noise level measurement made pursuant to the provisions of this title shall be measured with a sound level meter using an A-weighting and "slow"

response pursuant to applicable manufacturer's instructions, except that for sounds of a duration of two seconds or less, the "fast" response shall be used and the average level during the occurrence of the sound reported.

2. Calibration of Meter. The sound level meter shall be approximately calibrated and adjusted as necessary by means of an acoustical calibrator of the coupler-type to assure meter accuracy within the tolerances set forth in American National Standards ANSI-SI.4-1971.
 3. Location of Microphone. All measurements shall be taken at any lot line of a lot within the applicable zoning district. The measuring microphone shall not be less than four feet above the ground, at least four feet distant from walls or other large reflecting surfaces and shall be protected from the effects of wind noises by the use of appropriate wind screens. In cases when the microphone shall be located within ten feet of walls or similar large reflecting surfaces, the actual measured distances and orientation of sources, microphone and reflecting surfaces shall be noted and recorded. In no case shall a noise measurement be taken within five feet of the noise source.
 4. Measured Sound Levels. The measurement of sound level limits shall be the average sound level for a period of one hour.
- F. Compliance. The director may require the applicant for a building permit, prior to the issuance of such permit, to submit such information with respect to proposed machinery, processes, products, or environmental impacts as may be necessary to demonstrate the ability of the proposed uses to comply with the requirements of this chapter.
1. Acoustic studies that include assessment of noise levels and recommend mitigation measures shall be required for projects that are likely to be exposed to noise levels exceeding the standards in this chapter based on project location and surrounding uses.
 2. The California Land Use Compatibility standards for community noise environments published by the Governor's Office of Planning and Research shall be used as a basis for review of any new residential, commercial and mixed-use development.
 3. Whenever an environmental impact report has been submitted and determined to be adequate under state and city guidelines, no further information shall be required.

- a. Locating air intakes away from high volume roadways and/or truck loading zones.
 - b. Ensuring that building heating, ventilation, and air conditioning systems include appropriately sized maximum efficiency rating (MERV) filters
5. Measures identified in the HRA shall be included in the environmental document and/or incorporated into the site development plan as a component of the proposed project. The air intake design and MERV filter requirements shall be noted and/or reflected on all building plans submitted to the City for review and verification by the Director and the City Building Official.

16.502.08 VIBRATION

No use shall be operated in a manner that produces vibrations discernible without instruments at any point on the property line of the lot on which the use is located.

16.502.09 NOISE

- A. **Purpose.** The purpose of these regulations is to implement the General Plan policies on noise exposure and land use compatibility policies. More specifically, the purpose of the noise standards is to:
 1. Establish the principles and context for the application of noise limits, standards for noise exposure and land use compatibility, and requirements for reasonable noise attenuation measures;
 2. Protect noise sensitive uses from excessive noise exposure from other uses;
 3. Establish regulations for maximum noise limits and procedures for enforcing them
 4. Prevent any land use from generating sound that exceeds specific maximum levels based on the type uses and the type of noise.
- B. **Exemptions.** The following facilities and uses are exempt from these regulations:
 1. **Emergencies.** The emission of sound for the purpose of alerting persons to the existence of an emergency, the performance of emergency work, or the operation of emergency equipment including, but not limited to, generators.
 2. **Warning Devices.** Warning devices necessary for the protection of the public safety, such as police, fire, and ambulance sirens.
 3. **Special Events.** Occasional outdoor gatherings, public dances, shows, and sporting and entertainment events, provided that such events are conducted pursuant to a permit or license issued by the City.
 4. **Religious Institutions and Other Similar Organizations.** Unamplified bells, chimes, or other similar devices used by religious institutions and other houses of religious worship.
 5. **Time signals.** Signals produced by places of employment or worship and school recess signals providing no one sound exceeds 5 seconds in duration and no one series of sounds exceeds 24 seconds in duration.
 6. **Municipal Solid Waste Collection.** Collection of solid waste, vegetative waste, and recyclable materials by the City or under contract with the City.
 7. **Public Works Construction Projects, Maintenance, and Repair.** Street, utility, and similar construction projects undertaken by or under contract to or direction of the City, or the State of California or a public utility regulated by the California Public Utilities Commission, as well as maintenance and repair operations conducted by such parties, including street sweeping, debris and litter removal, removal of downed wires, restoring electrical service, repairing traffic signals, unplugging sewers, vacuuming catch basins, repairing of damaged poles, removal of abandoned vehicles, repairing of water hydrants and mains, gas lines, oil lines, sewers, storm drains, roads, and sidewalks.
 8. **Transportation equipment.** Sounds from transportation equipment such as trucks and buses used primarily in the movement of goods and people to and from given premises and in connection with temporary construction or demolition work.
 9. **Utility Facilities.** Facilities including without limitation 60-cycle electric power transformers and related equipment, sewer lift stations, municipal wells, and pumping stations.

C. General Requirements.

1. No person shall make, or cause to suffer, or permit to be made upon any public property, public right-of-way or private property, any excessive noise, annoying noise, amplified sound or vibrations that are physically annoying to reasonable persons of normal sensitivity or that are so harsh or so prolonged or unnatural or unusual in their use, time or place as to cause or contribute to the unnecessary and unreasonable discomfort of any persons of normal sensitivity located at the lot line of the property from which these noises emanate or that interfere with the peace and comfort of residents or their guests, or the operators or customers in places of business in the vicinity, or that may detrimentally or adversely affect such residences or places of business.
2. **Noise standards.** Table 16.502-C classifies uses and facilities and establishes exterior and interior noise standards applicable to all uses and facilities in each classification that is not exempt from these requirements pursuant to Subsection B. The requirements impose limits on regularly occurring noise for the specified time periods, averaged over an hour, and do not apply to incidental, infrequent, or unexpected noise, which are subject to Vallejo Municipal Code Chapter 7.84, Regulations of Noise Disturbances. The prohibitions contained in Municipal Code Chapter 7.84, apply to all land uses and activities in the City, and, in the case of a conflict, the more restrictive provisions apply.

TABLE 16.502-C: MAXIMUM NOISE LEVEL BY NOISE ZONE

Noise Zoning districts	Maximum Noise Level in dBA (level not to be exceeded more than 30 minutes in any hour)		Maximum Noise Level in dBA (level not to be exceeded more than 5 minutes in any hour)
	Measured at Property Line or District Boundary	Measured at Any Boundary of a Residential Zone	Between 10 PM and 7AM, Measured at Any Boundary of a Residential Zone
Single-Unit Residential	60	60	-
Multiple-Unit Residential	65	65	-
Commercial and Mixed-Use, Medical, Office	70	60	50 or ambient noise level
Light Industrial	75	65	50 or ambient noise level
General Industrial	75	65	50 or ambient noise level
Public Facilities and Community Use	65	60	50 or ambient noise level
Open Space and Recreational Districts	65	60	50 or ambient noise level

3. The standard limits in Table 16.502-D shall be adjusted by 5 decibels for any noise that contains a steady, pure tone such as a whine, screech or hum, or an impulsive sound such as hammering or riveting, or contains music or speech, as described in the following table.

TABLE 16.502-D : MAXIMUM NOISE LEVEL ADJUSTMENT BY TIME AND TYPE

TIME AND TYPE OF NOISE	ADJUSTMENT (DECIBELS)
Any type other than construction and related activities between 7 am and 10 pm	+5
Noise of unusual impulsive character (e.g., hammering or drilling)	-5
Noise of unusual periodic character (e.g., hammering or screeching)	-5

D. **Additional Regulations.** In addition to the following restrictions, hours may be modified with condition imposed by any conditional use permit or variance. The most restrictive hours shall apply.

1. **Construction hours.** Construction, demolition, and related loading/unloading activities that may generate noise exceeding levels in Table 16.502.E shall be limited to hours between 7 am and 7 pm in Residential Zoning Districts and in any mixed-use district.

TABLE 16.502-E: MAXIMUM NOISE LEVEL FOR TEMPORARY CONSTRUCTION ACTIVITY

Time	RR, RLD	RMD, RHD, NMX, NC	Commercial (Including medical and office) and Industrial
Mobile construction equipment—non-scheduled, intermittent, and short-term for less than 15 days			
Weekdays 7am to 6pm	75 dBA	80 dBA	85 dBA
Saturdays 9am to 6pm	60 dBA	65 dBA	70 dBA
Sundays and legal holidays	None	None	None
Stationary construction equipment			
Weekdays 7am to 6pm	60 dBA	65 dBA	70 dBA
Saturdays 9am to 6pm	60 dBA	65 dBA	70 dBA
Sundays and legal holidays	None	None	None

2. **Noise measurement.** In determining whether any noise exceeds the maximum exterior noise limits set forth in this Chapter, measurements shall be taken at the property line of the property from which the noise emanates, except that for noise emanating from property in a IG Zoning District, measurement shall be taken at boundary of the zoning district in which the property is located. **Residential noise levels.**
 - a. **Interior.** No person shall operate or cause to be operated within a dwelling unit, any source of sound that causes the sound level when measured inside a neighboring receiving dwelling unit to exceed the allowable noise level, for any period of time.

- b. **Exterior.** The exterior noise limits for any source of noise within any residential zone shall be reduced by 10 dBA between 10:00 p.m. and 7:00 a.m. The exterior noise limits for any source of noise in any zone other than a residential zone shall be reduced between 10:00 p.m. and 7:00 a.m. so that when the noise measured at the property line of a “noise-sensitive use” does not exceed 50 dBA. The interior noise level for steady state continuous noise from exterior sources in any residential bedroom with windows open between 10:00 p.m. and 7:00 a.m. shall not exceed 30 dBA.
- c. **Mitigation required.** New single-unit residential projects shall be located and designed so the noise levels in private use areas does not exceed 60 Ldn. For new multiple-unit residential projects a standard of 65 Ldn shall apply to outdoor areas excluding balconies.
- d. Noise from sources not under local jurisdiction such as freeways and aircraft shall be exempt.
- e. Developers of mixed-use projects that include residential development shall notify all potential residents that they may be exposed to noise from adjacent and nearby commercial, retail, entertainment, and circulation activity.

E. **Noise level measurement.** The following provisions establish a means for measuring noise levels. Where these provisions conflict with other requirements of the Vallejo Municipal Code, the following shall remain applicable for purposes of the Zoning Code:

1. **Setting of Meter.** Any sound or noise level measurement made pursuant to the provisions of this title shall be measured with a sound level meter using an A-weighting and “slow” response pursuant to applicable manufacturer’s instructions, except that for sounds of a duration of 2 seconds or less, the “fast” response shall be used and the average level during the occurrence of the sound reported.
2. **Calibration of Meter.** The sound level meter shall be approximately calibrated and adjusted as necessary by means of an acoustical calibrator of the coupler-type to assure meter accuracy within the tolerances set forth in American National Standards ANSI-SI.4-1971.

3. **Location of Microphone.** All measurements shall be taken at any lot line of a lot within the applicable zoning district. The measuring microphone shall not be less than 4 feet above the ground, at least 4 feet distant from walls or other large reflecting surfaces and shall be protected from the effects of wind noises by the use of appropriate wind screens. In cases when the microphone shall be located within 10 feet of walls or similar large reflecting surfaces, the actual measured distances and orientation of sources, microphone and reflecting surfaces shall be noted and recorded. In no case shall a noise measurement be taken within 5 feet of the noise source.
 4. **Measured Sound Levels.** The measurement of sound level limits shall be the average sound level for a period of one hour.
- F. **Compliance.** The Director may require the applicant for a building permit, prior to the issuance of such permit, to submit such information with respect to proposed machinery, processes, products, or environmental impacts as may be necessary to demonstrate the ability of the proposed uses to comply with the requirements of this Chapter.
1. Acoustic studies that include assessment of noise levels and recommend mitigation measures shall be required for projects that are likely to be exposed to noise levels exceeding the standards in this Chapter based on project location and surrounding uses.
 2. The California Land Use Compatibility standards for community noise environments published by the Governor's Office of Planning and Research shall be used as a basis for review of any new residential, commercial and mixed-use development.
 3. Whenever an environmental impact report has been submitted and determined to be adequate under state and city guidelines, no further information shall be required.

16.503 TRIP-REDUCTION MEASURES

16.503.01 PURPOSE AND APPLICABILITY

These regulations are established to make Vallejo a more attractive and healthful place to live, work, visit, and do business by reducing traffic congestion, demand for parking and associated air pollution noise, fuel consumption. More specifically, the provisions of this Chapter are intended to:

- A. Implement State requirements requiring cities to address greenhouse gas emissions contributing to climate change and General Plan policies to decrease dependence on single-occupant vehicles by requiring development to incorporate measures to reduce Vehicle Miles Traveled (VMT);
- B. Improve the mobility and general efficiency of circulation and transportation systems by increasing reliance on public transit, ridesharing, walking, car-sharing, cycling and focusing development in areas close to transit and employment;
- C. Reduce traffic impacts within the community and region, vehicular air pollutant emissions, energy usage, and ambient noise levels through a reduction in the number of per capita vehicle miles traveled and management of traffic congestion;
- D. Inform residents, workers, employers and other business owners about travel options and the impacts of travel choices;
- E. Coordinate transportation system management, TDM, and transportation facility development strategies Citywide, with other cities in the region and through regional agencies; and,
- F. Support local and regional efforts to relieve traffic congestion in and around the City.
- G. The requirements of this Chapter apply to:
 1. New multi-unit development of 10 units or more;
 2. New non-residential development of 10,000 square feet or more; and
 3. Employers with 50 or more employees at a single worksite within the City except for employers subject to Bay Area Air Quality Management District (BAAQMD) Regulation 13, Rule 1, Trip Reduction Requirements for Large Employers.

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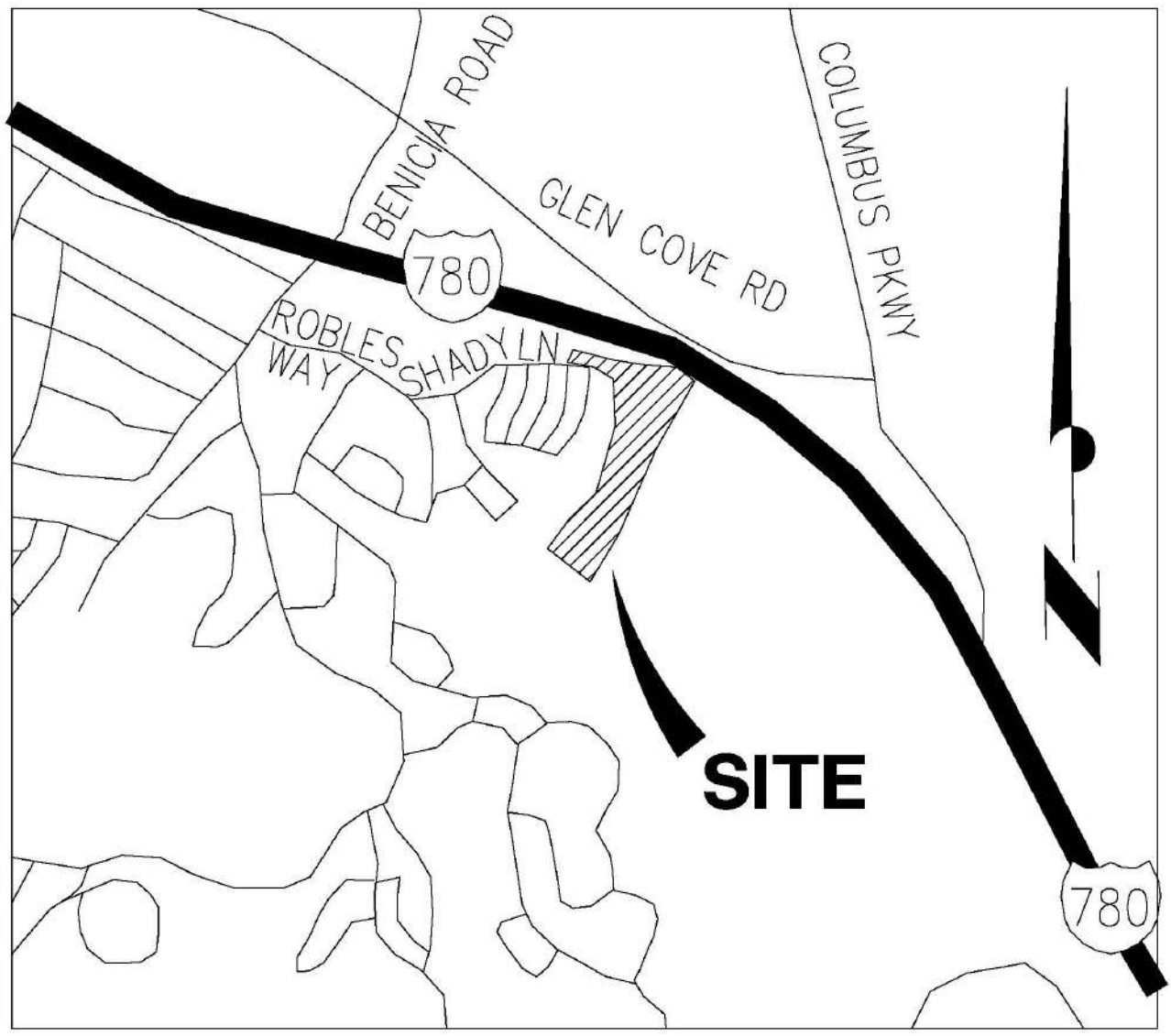
APPENDIX 4.1:

PROJECT SITE PLAN

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VISTA COVE CONCEPTUAL LAND USE PLAN

CITY OF VALLEJO SB-330 HOUSING DEVELOPMENT APPLICATION



VICINITY MAP
NOT TO SCALE

LEGEND

DESCRIPTION	
PROJECT BOUNDARY	=====
PROPERTY LINE	=====
RIGHT OF WAY	=====
FACE AND BACK OF CURB, BACK OF WALK	=====
ADJOINING LOT LINE	=====
STORMWATER BASIN	=====
LOT NUMBER	32

DEVELOPMENT SUMMARY

SITE ADDRESS:
SHADY LANE AND WILDFLOWER ROAD
VALLEJO, CA

BENCHMARK:
VERTICAL DATUM NAVD88 GEOID 12B DERIVED FROM OPUS
SOLUTION

ASSESSORS PARCEL NUMBERS:
0037-030-200, 0037-030-210, 0037-060-480

PROJECT SITE AREA:
TOTAL SITE ACREAGE: 20.13± ACRES
DISTURBED AREA: 10.52± ACRES
UNDISTURBED AREA: 9.61± ACRES

PROJECT FLOOD ZONE:
ZONE X

EXISTING ZONING:
RESIDENTIAL MEDIUM DENSITY

EXISTING USE:
UNDEVELOPED LAND

PROPOSED USE:
51 LOT SINGLE FAMILY SUBDIVISION

PROJECT TEAM

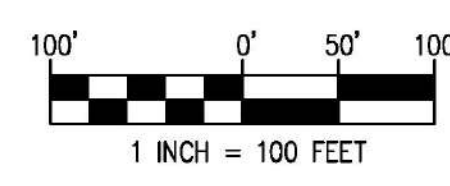
OWNER/APPLICANT:
SANCERRA VISTA COVE, LLC
2618 SAN MIGUEL DRIVE, SUITE 1223
NEWPORT BEACH, CA 92660
(949) 466-9604
CONTACT: ADAM SMITH

CIVIL ENGINEER:
dk ENGINEERING
1931 SAN MIGUEL DR, SUITE 100
WALNUT CREEK, CA 94596
(925) 932-6868
PROJECT MANAGER: ANGELA PEDRONCELLI

ARCHITECT:
ROBERT HIDEY ARCHITECTS
3337 MICHELSON DRIVE, SUITE 170
IRVINE, CA 92612
(949) 655-1550
CONTACT: DAN WEIGEL

ENVIRONMENTAL:
WRA ENVIRONMENTAL CONSULTANTS
2169-G EAST FRANCISCO BLVD
SAN RAFAEL, CA 94901
(949) 524-7542
CONTACT: PATRICIA VALCARCEL

GEOTECHNICAL ENGINEER:
ENGEO
2010 CROW CANYON PLACE, SUITE 250
SAN RAMON, CA 94583
(925) 866-9000
CONTACT: JACOB WHITE



SHEET INDEX	
Sheet Number	Sheet Title
C1.0	COVER SHEET
C2.0	EXISTING BOUNDARY AND TOPOGRAPHY
C3.0	CONCEPTUAL GRADING AND SITE PLAN

CITY OF VALLEJO SB-330
HOUSING DEVELOPMENT APPLICATION
VISTA COVE
COVER SHEET
APNS: 0079-120-100,0079-171-170, 0079-220-070
VALLEJO, CALIFORNIA
FOR
SANCERRA
NOVEMBER 2022





TITLE REPORT

FIRST AMERICAN TITLE COMPANY
APN: 0079-120-100; 0079-171-170
DATED: JUNE 21, 2022

BENCHMARK

VERTICAL DATUM NAVD88 GEOID 12B DERIVED FROM OPUS SOLUTION

BASIS OF BEARINGS

BEARING SHOWN HEREON ARE ON CALIFORNIA STATE PLANE COORDINATE SYSTEM, ZONE 2 (GRID), HORIZONTAL DATUM USING THE NAD83 (2011) (EPOCH 2010.0000), US SURVEY FEET.

TOPOGRAPHIC SURVEY

TOPOGRAPHIC FEATURES SHOWN HEREON GENERATED BY A DRONE FLIGHT BY ALL POINTS SURVEYING & MAPPING, INC. ON JUNE 22, 2022. SUPPLEMENTAL FIELD SURVEY CONDUCTED BY dk FIELD CREW.

CONTOUR INTERVAL

EXISTING: 2 FOOT AND 10 FOOT

NOTE

COORDINATE SYSTEM IS NAD83 CALIFORNIA STATE PLANE ZONE II, US SURVEY FOOT

REFERENCES

- (1) 7 PM 58
- (2) 36 M 93
- (3) 1987-35791 & 2018-21819

LEGEND

DESCRIPTION

- PROPERTY LINE
- EASEMENT LINE
- MAJOR CONTOUR
- MINOR CONTOUR
- BACK OF CURB, FACE OF CURB, LIP OF GUTTER
- DIRT TRAIL
- FOUND MONUMENT
- FOUND IRON PIPE
- TREE DRIPLINE
- FENCE
- FLOW LINE
- WATER MAIN
- SANITARY SEWER MAIN, MANHOLES, CLEAN OUT
- STORM DRAIN LINE
- ADJOINING PROPERTY LINE

ABBREVIATIONS

- APN ACCESSOR'S PARCEL NUMBER
- APPURT. APPURTENANT
- EAS. EASEMENT
- INST. INSTRUMENT
- L. LENGTH
- LME LANDSCAPE MAINTENANCE EASEMENT
- NO. NUMBER
- PAR. PARCEL
- PORT. PORTION
- R. RADIUS
- TR. TITLE REPORT

CITY OF VALLEJO SB-330
HOUSING DEVELOPMENT APPLICATION
VISTA COVE
EXISTING BOUNDARY AND TOPOGRAPHY
APNS: 0079-120-100,0079-171-170, 0079-220-070
VALLEJO, CALIFORNIA
FOR
SANCERRA
NOVEMBER 2022



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APPENDIX 7.1:

ON-SITE TRAFFIC NOISE LEVEL CALCULATIONS

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15304 - Vista Cove

CadnaA Noise Prediction Model: 15304-07_2nd.cna

Date: 25.02.25

Analyst: B. Maddux

Calculation Configuration

Configuration	
Parameter	Value
General	
Max. Error (dB)	0.00
Max. Search Radius (ft)	6561.70
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (ft)	3280.80
Min. Length of Section (ft)	3.30
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	5.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	2
Search Radius Src	328.08
Search Radius Rcvr	328.08
Max. Distance Source - Rcvr	3280.84 3280.84
Min. Distance Rcvr - Reflector	3.28 3.28
Min. Distance Source - Reflector	0.33
Industrial (ISO 9613 (1996))	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Incl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (°F)	50
rel. Humidity (%)	70
Ground Absorption G	0.50
Wind Speed for Dir. (mph)	6.7
Roads (TNM)	
Railways (FTA/FRA)	
Aircraft (???)	
Strictly acc. to AzB	

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height	Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type		X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)	(ft)	(ft)	(ft)
R01		R01	53.2	37.8	51.3	0.0	0.0	0.0		x	Total	14.00	r 6503316.70	1792391.47	185.95
R02		R02	66.0	50.7	64.1	0.0	0.0	0.0		x	Total	14.00	r 6503792.08	1792298.97	155.27
R03		R03	70.6	55.3	68.7	0.0	0.0	0.0		x	Total	14.00	r 6503900.65	1792338.20	131.69
R04		R04	71.4	56.0	69.5	0.0	0.0	0.0		x	Total	14.00	r 6504013.17	1792302.44	129.00
R05		R05	68.7	53.4	66.8	0.0	0.0	0.0		x	Total	14.00	r 6504015.36	1792265.83	128.34
R06		R06	65.2	49.8	63.3	0.0	0.0	0.0		x	Total	14.00	r 6504016.16	1792226.02	127.00
R07		R07	68.3	52.9	66.4	0.0	0.0	0.0		x	Total	14.00	r 6504064.23	1792265.71	113.44
R08		R08	63.9	48.5	62.0	0.0	0.0	0.0		x	Total	14.00	r 6504064.20	1792231.57	113.89
R09		R09	71.8	56.5	69.9	0.0	0.0	0.0		x	Total	14.00	r 6504239.40	1792227.25	113.07
R10		R10	70.1	54.7	68.2	0.0	0.0	0.0		x	Total	14.00	r 6504240.03	1792187.25	114.07
R11		R11	68.5	53.2	66.6	0.0	0.0	0.0		x	Total	14.00	r 6504242.39	1792153.76	114.18
R12		R12	66.2	50.8	64.3	0.0	0.0	0.0		x	Total	14.00	r 6504238.04	1792100.50	115.39
R13		R13	62.1	46.7	60.2	0.0	0.0	0.0		x	Total	14.00	r 6504201.92	1792057.79	116.39
R14		R14	60.0	44.7	58.1	0.0	0.0	0.0		x	Total	14.00	r 6504187.97	1792024.62	116.78
R15		R15	57.6	42.2	55.7	0.0	0.0	0.0		x	Total	14.00	r 6504171.19	1791986.27	114.93

Point Source(s)

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			Height	Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night		X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(ft)	(ft)	(ft)	(ft)

Line Source(s)

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Operating Time			Moving Pt. Src			Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	Number		Speed		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	Day	Evening	Night	(mph)	(ft)

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Operating Time			Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)		

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Barrier(s)

Name	Sel.	M.	ID	Absorption		Z-Ext.	Cantilever		Height		Coordinates			
				left	right		horz.	vert.	Begin	End	x	y	z	Ground
						(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
B01			B01	1.00	1.00				6.00	r	6504175.34	1792232.09	105.00	99.00
											6504253.76	1792232.70	105.00	99.00
B02			B02	1.00	1.00				6.00	r	6504253.76	1792232.70	105.00	99.00
											6504250.02	1792193.18	106.00	100.00
B03			B03	1.00	1.00				5.00	r	6504249.97	1792193.38	105.00	100.00
											6504251.92	1792112.28	105.00	100.00
B04			B04	1.00	1.00						6503898.82	1792355.22	124.02	118.02
											6503936.90	1792339.69	124.02	118.02
B05			B05	1.00	1.00				5.00	r	6503955.25	1792333.41	120.92	115.92
											6504032.68	1792304.73	120.00	115.00
B06			B06	1.00	1.00				5.00	r	6504032.68	1792304.73	120.00	115.00
											6504033.70	1792265.82	119.41	114.41
B07			B07	1.00	1.00				5.00	r	6504033.70	1792265.82	119.41	114.41
											6504034.73	1792226.91	118.00	113.00
B08			B08	1.00	1.00				6.00	r	6504061.39	1792272.27	108.06	102.06
											6504132.68	1792272.43	105.00	99.00
B09			B09	1.00	1.00						6503803.37	1792340.98	146.00	140.00
											6503810.85	1792336.28	146.00	140.00

Building(s)

Name	Sel.	M.	ID	RB	Residents	Absorption	Height	Coordinates			
							Begin	x	y	z	Ground
							(ft)	(ft)	(ft)	(ft)	(ft)

Ground Absorption(s)

Name	Sel.	M.	ID	G	Coordinates	
					x	y
					(ft)	(ft)

Vertical Area Source(s)

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Rail

Name	Sel.	M.	ID	Lw'	Train Class	Correct.	Vmax
				Day	Night	Track	
				(dBA)	(dBA)	(dB)	(km(mph))

Sound Level Spectra

Name			ID	Type	Oktave Spectrum (dB)										Source	
					Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin

Roads

Name	Sel.	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflection		
				Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type		Drefl	Hbuild	Dist.
				(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(mph)	(mph)		(dB)		(%)	(dB)	(ft)	(ft)
I-780 WB			0	72.8	62.6	57.4			2503.0	237.0	73.0	2.3	2.3	2.3	65	55	14	0.0	1	0.0	0.0		
I-780 EB			0	72.8	62.6	57.4			2503.0	237.0	73.0	2.3	2.3	2.3	65	55	14	0.0	1	0.0	0.0		

RoadsGeo

Name	Height		Coordinates				Dist (ft)	LSlope (%)
	Begin (ft)	End (ft)	x (ft)	y (ft)	z (ft)	Ground (ft)		
I-780 WB	0.00	r	6505292.14	1791898.17	24.96	24.96		
			6505194.63	1791966.53	28.00	28.00		
			6505048.81	1792061.64	32.96	32.96		
			6504955.18	1792117.35	36.99	36.99		
			6504802.81	1792204.88	41.01	41.01		
			6504695.59	1792261.57	46.00	46.00		
			6504585.80	1792316.04	52.01	52.01		
			6504386.01	1792404.15	62.99	62.99		
			6504275.66	1792451.35	69.00	69.00		
			6504087.19	1792521.97	78.99	78.99		
			6503958.31	1792565.84	85.97	85.97		
			6503839.79	1792601.54	91.97	91.97		
			6503666.79	1792650.21	100.99	100.99		
			6503552.44	1792679.71	106.98	106.98		
			6503113.49	1792768.36	128.01	128.01		
			6502805.54	1792827.84	142.55	142.55		
			6502808.06	1792753.64	138.51	138.51		
			6503359.28	1792648.86	114.95	114.95		
			6503494.04	1792621.36	107.99	107.99		
			6503665.68	1792579.25	98.99	98.99		
			6503781.79	1792547.69	92.98	92.98		
I-780 EB	0.00	r	6503912.11	1792506.35	86.00	86.00		
			6504063.11	1792455.67	78.00	78.00		
			6504176.31	1792413.84	72.00	72.00		
			6504364.80	1792337.05	62.00	62.00		
			6504614.81	1792222.35	47.97	47.97		
			6504750.94	1792156.22	41.00	41.00		
			6504992.42	1792021.73	32.00	32.00		
			6505179.81	1791901.72	25.98	25.98		
			6505226.21	1791868.04	23.87	23.87		

15304 - Vista Cove

CadnaA Noise Prediction Model: 15304-07_On-Site.cna

Date: 25.02.25

Analyst: B. Maddux

Calculation Configuration

Configuration	
Parameter	Value
General	
Max. Error (dB)	0.00
Max. Search Radius (ft)	6561.70
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (ft)	3280.80
Min. Length of Section (ft)	3.30
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	5.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	7.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	2
Search Radius Src	328.08
Search Radius Rcvr	328.08
Max. Distance Source - Rcvr	3280.84 3280.84
Min. Distance Rcvr - Reflector	3.28 3.28
Min. Distance Source - Reflector	0.33
Industrial (ISO 9613 (1996))	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Incl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (°F)	50
rel. Humidity (%)	70
Ground Absorption G	0.50
Wind Speed for Dir. (mph)	6.7
Roads (TNM)	
Railways (FTA/FRA)	
Aircraft (???)	
Strictly acc. to AzB	

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height	Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type		X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)	(ft)	(ft)	(ft)
R01		R01	48.4	33.0	46.5	0.0	0.0	0.0		x	Total	5.00	r 6503316.70	1792391.47	176.95
R02		R02	63.0	47.7	61.2	0.0	0.0	0.0		x	Total	5.00	r 6503792.08	1792298.97	146.27
R03		R03	68.3	52.9	66.4	0.0	0.0	0.0		x	Total	5.00	r 6503900.65	1792338.20	122.69
R04		R04	70.2	54.9	68.3	0.0	0.0	0.0		x	Total	5.00	r 6504013.17	1792302.44	120.00
R05		R05	64.2	48.8	62.3	0.0	0.0	0.0		x	Total	5.00	r 6504015.36	1792265.83	119.34
R06		R06	61.0	45.7	59.1	0.0	0.0	0.0		x	Total	5.00	r 6504016.16	1792226.02	118.00
R07		R07	62.8	47.5	60.9	0.0	0.0	0.0		x	Total	5.00	r 6504064.23	1792265.71	104.44
R08		R08	59.0	43.7	57.1	0.0	0.0	0.0		x	Total	5.00	r 6504064.20	1792231.57	104.89
R09		R09	70.7	55.4	68.8	0.0	0.0	0.0		x	Total	5.00	r 6504239.40	1792227.25	104.07
R10		R10	68.0	52.6	66.1	0.0	0.0	0.0		x	Total	5.00	r 6504240.03	1792187.25	105.07
R11		R11	66.5	51.2	64.6	0.0	0.0	0.0		x	Total	5.00	r 6504242.39	1792153.76	105.18
R12		R12	64.0	48.7	62.1	0.0	0.0	0.0		x	Total	5.00	r 6504238.04	1792100.50	106.39
R13		R13	59.2	43.8	57.3	0.0	0.0	0.0		x	Total	5.00	r 6504201.92	1792057.79	107.39
R14		R14	54.9	39.6	53.0	0.0	0.0	0.0		x	Total	5.00	r 6504187.97	1792024.62	107.78
R15		R15	51.4	36.1	49.5	0.0	0.0	0.0		x	Total	5.00	r 6504171.19	1791986.27	105.93

Point Source(s)

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night		X	Y	Z	
			(dBA)	(dBA)	(dBA)		dB(A)	(min)	(min)	(min)		(ft)	(ft)	(ft)	(ft)	

Line Source(s)

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Operating Time			Moving Pt. Src			Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	Number		Speed	(ft)	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	Day	Evening	Night	(mph)	(ft)

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Operating Time			Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	(ft)	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)		

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Barrier(s)

Name	Sel.	M.	ID	Absorption		Z-Ext.	Cantilever		Height		Coordinates			
				left	right		horz.	vert.	Begin	End	x	y	z	Ground
						(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Building(s)

Name	Sel.	M.	ID	RB	Residents	Absorption	Height	Coordinates			
							Begin	x	y	z	Ground
							(ft)	(ft)	(ft)	(ft)	(ft)

Ground Absorption(s)

Name	Sel.	M.	ID	G	Coordinates	
					x	y
					(ft)	(ft)

Vertical Area Source(s)

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Rail

Name	Sel.	M.	ID	Lw'		Train Class	Correct.	Vmax
				Day	Night		Track	
				(dBA)	(dBA)		(dB)	(km(mph))

Sound Level Spectra

Name			ID	Type	Oktave Spectrum (dB)										Source	
					Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin

Roads

Name	Sel.	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflection		
				Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type		Drefl	Hbuild	Dist.
				(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(mph)	(mph)		(dB)		(%)	(dB)	(ft)	(ft)
I-780 WB			0	72.8	62.6	57.4			2503.0	237.0	73.0	2.3	2.3	2.3	65	55	14	0.0	1	0.0	0.0		
I-780 EB			0	72.8	62.6	57.4			2503.0	237.0	73.0	2.3	2.3	2.3	65	55	14	0.0	1	0.0	0.0		

RoadsGeo

Name	Height		Coordinates				Dist	LSlope
	Begin	End	x	y	z	Ground		(%)
	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		
I-780 WB	0.00	r	6505292.14	1791898.17	24.97	24.97		
			6505194.63	1791966.53	28.00	28.00		
			6505048.81	1792061.64	32.96	32.96		
			6504955.18	1792117.35	36.99	36.99		
			6504802.81	1792204.88	41.01	41.01		
			6504695.59	1792261.57	46.00	46.00		
			6504585.80	1792316.04	52.01	52.01		
			6504386.01	1792404.15	62.99	62.99		
			6504275.66	1792451.35	69.00	69.00		
			6504087.19	1792521.97	78.99	78.99		
			6503958.31	1792565.84	85.97	85.97		
			6503839.79	1792601.54	91.97	91.97		
			6503666.79	1792650.21	100.99	100.99		
			6503552.44	1792679.71	106.98	106.98		

Name	Height		Coordinates				Dist (ft)	LSlope (%)
	Begin (ft)	End (ft)	x (ft)	y (ft)	z (ft)	Ground (ft)		
			6503113.49	1792768.36	128.01	128.01		
			6502805.54	1792827.84	142.57	142.57		
I-780 EB	0.00	r	6502808.06	1792753.64	138.73	138.73		
			6503359.28	1792648.86	114.95	114.95		
			6503494.04	1792621.36	107.99	107.99		
			6503665.68	1792579.25	98.99	98.99		
			6503781.79	1792547.69	92.98	92.98		
			6503912.11	1792506.35	86.00	86.00		
			6504063.11	1792455.67	78.00	78.00		
			6504176.31	1792413.84	72.00	72.00		
			6504364.80	1792337.05	62.00	62.00		
			6504614.81	1792222.35	47.97	47.97		
			6504750.94	1792156.22	41.00	41.00		
			6504992.42	1792021.73	32.00	32.00		
			6505179.81	1791901.72	25.98	25.98		
			6505226.21	1791868.04	23.91	23.91		

15304 - Vista Cove

CadnaA Noise Prediction Model: 15304-07_On-Site_Mitigated.cna

Date: 25.02.25

Analyst: B. Maddux

Calculation Configuration

Configuration	
Parameter	Value
General	
Max. Error (dB)	0.00
Max. Search Radius (ft)	6561.70
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (ft)	3280.80
Min. Length of Section (ft)	3.30
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	5.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	0.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	2
Search Radius Src	328.08
Search Radius Rcvr	328.08
Max. Distance Source - Rcvr	3280.84 3280.84
Min. Distance Rcvr - Reflector	3.28 3.28
Min. Distance Source - Reflector	0.33
Industrial (ISO 9613 (1996))	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Incl. Ground Att. over Barrier
	Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (°F)	50
rel. Humidity (%)	70
Ground Absorption G	0.50
Wind Speed for Dir. (mph)	6.7
Roads (TNM)	
Railways (FTA/FRA)	
Aircraft (???)	
Strictly acc. to AzB	

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height	Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type		X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)	(ft)	(ft)	(ft)
R01		R01	48.0	32.7	46.1	0.0	0.0	0.0		x	Total	5.00	r 6503316.70	1792391.47	176.95
R02		R02	61.6	46.3	59.7	0.0	0.0	0.0		x	Total	5.00	r 6503792.08	1792298.97	146.27
R03		R03	61.8	46.5	59.9	0.0	0.0	0.0		x	Total	5.00	r 6503900.65	1792338.20	122.69
R04		R04	60.7	45.4	58.9	0.0	0.0	0.0		x	Total	5.00	r 6504013.17	1792302.44	120.00
R05		R05	57.6	42.2	55.7	0.0	0.0	0.0		x	Total	5.00	r 6504015.36	1792265.83	119.34
R06		R06	56.0	40.7	54.1	0.0	0.0	0.0		x	Total	5.00	r 6504016.16	1792226.02	118.00
R07		R07	57.9	42.5	56.0	0.0	0.0	0.0		x	Total	5.00	r 6504064.23	1792265.71	104.84
R08		R08	55.9	40.6	54.0	0.0	0.0	0.0		x	Total	5.00	r 6504064.20	1792231.57	105.76
R09		R09	59.5	44.2	57.6	0.0	0.0	0.0		x	Total	5.00	r 6504239.40	1792227.25	104.00
R10		R10	59.2	43.9	57.3	0.0	0.0	0.0		x	Total	5.00	r 6504240.03	1792187.25	104.14
R11		R11	59.1	43.8	57.2	0.0	0.0	0.0		x	Total	5.00	r 6504242.39	1792153.76	104.70
R12		R12	61.9	46.5	60.0	0.0	0.0	0.0		x	Total	5.00	r 6504238.04	1792100.50	106.39
R13		R13	60.5	45.2	58.6	0.0	0.0	0.0		x	Total	5.00	r 6504201.92	1792057.79	107.39
R14		R14	56.7	41.4	54.8	0.0	0.0	0.0		x	Total	5.00	r 6504187.97	1792024.62	107.78
R15		R15	50.8	35.4	48.9	0.0	0.0	0.0		x	Total	5.00	r 6504171.19	1791986.27	105.93

Point Source(s)

Name	M.	ID	Result. PWL			Lw / Li		Operating Time			Height		Coordinates			
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night			X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(ft)		(ft)	(ft)	(ft)

Line Source(s)

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Operating Time			Moving Pt. Src			Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	Number		Speed		
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	Day	Evening	Night	(mph)	(ft)

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Operating Time			Height
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	(ft)
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Barrier(s)

Name	Sel.	M.	ID	Absorption		Z-Ext.	Cantilever		Height		Coordinates			
				left	right		horz.	vert.	Begin	End	x	y	z	Ground
						(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
R9 North			L17	1.00	1.00				6.00	r	6504175.34	1792232.09	105.00	99.00
											6504253.76	1792232.70	105.00	99.00
R9 East			L17	1.00	1.00				6.00	r	6504253.76	1792232.70	105.00	99.00
											6504250.02	1792193.18	105.00	99.00
R10-R11			L17	1.00	1.00				5.00	r	6504249.97	1792193.38	104.00	99.00
											6504251.92	1792112.28	105.05	100.05
R03 NE			L 8	1.00	1.00						6503898.82	1792355.22	124.02	118.02
											6503936.90	1792339.69	124.02	118.02
R4 NE			L 8	1.00	1.00				5.00	r	6503955.25	1792333.41	120.92	115.92
											6504032.68	1792304.73	120.00	115.00
R4 E			L 8	1.00	1.00				5.00	r	6504032.68	1792304.73	120.00	115.00
											6504033.70	1792265.82	119.41	114.41
R5			L 8	1.00	1.00				4.00	r	6504033.70	1792265.82	118.41	114.41
											6504034.73	1792226.91	117.00	113.00
R7 N			L 8	1.00	1.00						6504061.39	1792272.27	105.00	100.00
											6504132.68	1792272.43	105.00	100.00
R02			L 8	1.00	1.00						6503803.37	1792340.98	146.00	140.00
											6503810.85	1792336.28	146.00	140.00

Building(s)

Name	Sel.	M.	ID	RB	Residents	Absorption	Height	Coordinates			
							Begin	x	y	z	Ground
							(ft)	(ft)	(ft)	(ft)	(ft)

Ground Absorption(s)

Name	Sel.	M.	ID	G	Coordinates	
					x	y
					(ft)	(ft)

Vertical Area Source(s)

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Rail

Name	Sel.	M.	ID	Lw'	Train Class	Correct.	Vmax
				Day	Night	Track	
				(dBA)	(dBA)	(dB)	(km(mph))

Sound Level Spectra

Name			ID	Type	Oktave Spectrum (dB)										Source	
					Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin

Roads

Name	Sel.	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflection		
				Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type		Drefl	Hbuild	Dist.
				(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(mph)	(mph)		(dB)		(%)	(dB)	(ft)	(ft)
I-780 WB			0	72.8	62.6	57.4			2503.0	237.0	73.0	2.3	2.3	2.3	65	55	14	0.0	1	0.0	0.0		
I-780 EB			0	72.8	62.6	57.4			2503.0	237.0	73.0	2.3	2.3	2.3	65	55	14	0.0	1	0.0	0.0		

RoadsGeo

Name	Height		Coordinates				Dist (ft)	LSlope (%)
	Begin (ft)	End (ft)	x (ft)	y (ft)	z (ft)	Ground (ft)		
I-780 WB	0.00	r	6505292.14	1791898.17	24.96	24.96		
			6505194.63	1791966.53	28.00	28.00		
			6505048.81	1792061.64	32.96	32.96		
			6504955.18	1792117.35	36.99	36.99		
			6504802.81	1792204.88	41.01	41.01		
			6504695.59	1792261.57	46.00	46.00		
			6504585.80	1792316.04	52.01	52.01		
			6504386.01	1792404.15	62.99	62.99		
			6504275.66	1792451.35	69.00	69.00		
			6504087.19	1792521.97	78.99	78.99		
			6503958.31	1792565.84	85.97	85.97		
			6503839.79	1792601.54	91.97	91.97		
			6503666.79	1792650.21	100.99	100.99		
			6503552.44	1792679.71	106.98	106.98		
			6503113.49	1792768.36	128.01	128.01		
			6502805.54	1792827.84	142.55	142.55		
			6502808.06	1792753.64	138.51	138.51		
			6503359.28	1792648.86	114.95	114.95		
			6503494.04	1792621.36	107.99	107.99		
			6503665.68	1792579.25	98.99	98.99		
			6503781.79	1792547.69	92.98	92.98		
I-780 EB	0.00	r	6503912.11	1792506.35	86.00	86.00		
			6504063.11	1792455.67	78.00	78.00		
			6504176.31	1792413.84	72.00	72.00		
			6504364.80	1792337.05	62.00	62.00		
			6504614.81	1792222.35	47.97	47.97		
			6504750.94	1792156.22	41.00	41.00		
			6504992.42	1792021.73	32.00	32.00		
			6505179.81	1791901.72	25.98	25.98		
			6505226.21	1791868.04	23.87	23.87		

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APPENDIX 10.1:

OPERATIONAL NOISE LEVEL CALCULATIONS

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15304 - Vista Cove

CadnaA Noise Prediction Model: 15304-03_Operation.cna

Date: 25.02.25

Analyst: B. Maddux

Calculation Configuration

Configuration	
Parameter	Value
General	
Max. Error (dB)	0.00
Max. Search Radius (ft)	6561.70
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (ft)	3280.80
Min. Length of Section (ft)	3.30
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	5.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	7.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	2
Search Radius Src	328.08
Search Radius Rcvr	328.08
Max. Distance Source - Rcvr	3280.84 3280.84
Min. Distance Rcvr - Reflector	3.28 3.28
Min. Distance Source - Reflector	0.33
Industrial (ISO 9613 (1996))	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Incl. Ground Att. over Barrier Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (°F)	50
rel. Humidity (%)	70
Ground Absorption G	0.50
Wind Speed for Dir. (mph)	6.7
Roads (TNM)	
Railways (FTA/FRA)	
Aircraft (???)	
Strictly acc. to AzB	

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height	Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type		X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)	(ft)	(ft)	(ft)
R1		R1	29.8	29.8	36.5	0.0	0.0	0.0	x	Total		5.00 r	6503195.07	1792238.17	203.86
R2		R2	32.5	32.5	39.2	0.0	0.0	0.0	x	Total		5.00 r	6503356.55	1792236.21	186.21
R3		R3	29.7	29.7	36.4	0.0	0.0	0.0	x	Total		5.00 r	6503526.26	1792261.78	171.00
R4		R4	31.6	31.6	38.2	0.0	0.0	0.0	x	Total		5.00 r	6503537.30	1791883.32	168.35
R5		R5	33.3	33.3	40.0	0.0	0.0	0.0	x	Total		5.00 r	6503448.24	1791631.50	172.00
R6		R6	23.7	23.7	30.4	0.0	0.0	0.0	x	Total		5.00 r	6504520.65	1792550.76	54.26

Point Source(s)

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			Height	Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night		X	Y	Z
			(dBA)	(dBA)	(dBA)		dB(A)		(min)	(min)	(min)	(ft)	(ft)	(ft)	(ft)
AC001		AC001	76.0	76.0	76.0	Lw	76					3.00 r	6503331.76	1792349.37	173.00
AC002		AC002	76.0	76.0	76.0	Lw	76					3.00 r	6503358.01	1792385.64	175.82
AC003		AC003	76.0	76.0	76.0	Lw	76					3.00 r	6503781.49	1792258.40	144.00
AC004		AC004	76.0	76.0	76.0	Lw	76					3.00 r	6503862.56	1792203.03	118.00
AC005		AC005	76.0	76.0	76.0	Lw	76					3.00 r	6503861.39	1792240.00	118.86
AC006		AC006	76.0	76.0	76.0	Lw	76					3.00 r	6503860.26	1792276.33	119.87
AC007		AC007	76.0	76.0	76.0	Lw	76					3.00 r	6503860.33	1792316.93	120.54
AC008		AC008	76.0	76.0	76.0	Lw	76					3.00 r	6504022.10	1792280.50	118.00
AC009		AC009	76.0	76.0	76.0	Lw	76					3.00 r	6504021.73	1792241.40	116.52
AC010		AC010	76.0	76.0	76.0	Lw	76					3.00 r	6504023.14	1792215.83	115.83
AC011		AC011	76.0	76.0	76.0	Lw	76					3.00 r	6504010.82	1792152.94	115.00
AC012		AC012	76.0	76.0	76.0	Lw	76					3.00 r	6504047.64	1792119.96	105.20
AC013		AC013	76.0	76.0	76.0	Lw	76					3.00 r	6504061.86	1792151.33	104.31
AC014		AC014	76.0	76.0	76.0	Lw	76					3.00 r	6504071.05	1792176.44	103.84

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night			X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(ft)		(ft)	(ft)	(ft)
AC015		AC015	76.0	76.0	76.0	Lw	76					3.00	r	6504070.64	1792212.29	102.81
AC016		AC016	76.0	76.0	76.0	Lw	76					3.00	r	6504070.74	1792264.11	102.38
AC017		AC017	76.0	76.0	76.0	Lw	76					3.00	r	6504230.75	1792206.09	102.67
AC018		AC018	76.0	76.0	76.0	Lw	76					3.00	r	6504234.76	1792170.96	103.25
AC019		AC019	76.0	76.0	76.0	Lw	76					3.00	r	6504230.04	1792124.44	103.46
AC020		AC020	76.0	76.0	76.0	Lw	76					3.00	r	6504201.67	1792074.53	104.86
AC021		AC021	76.0	76.0	76.0	Lw	76					3.00	r	6504190.62	1792039.09	105.78
AC022		AC022	76.0	76.0	76.0	Lw	76					3.00	r	6504173.64	1792005.93	105.26
AC023		AC023	76.0	76.0	76.0	Lw	76					3.00	r	6504160.52	1791970.38	103.41
AC024		AC024	76.0	76.0	76.0	Lw	76					3.00	r	6503792.48	1791935.18	113.00
AC025		AC025	76.0	76.0	76.0	Lw	76					3.00	r	6503821.63	1791906.11	111.51
AC026		AC026	76.0	76.0	76.0	Lw	76					3.00	r	6503854.79	1791889.21	109.53
AC027		AC027	76.0	76.0	76.0	Lw	76					3.00	r	6503888.09	1791869.73	106.62
AC028		AC028	76.0	76.0	76.0	Lw	76					3.00	r	6503922.29	1791852.89	105.00
AC029		AC029	76.0	76.0	76.0	Lw	76					3.00	r	6503954.53	1791833.86	103.52
AC030		AC030	76.0	76.0	76.0	Lw	76					3.00	r	6503726.80	1791768.16	111.48
AC031		AC031	76.0	76.0	76.0	Lw	76					3.00	r	6503765.69	1791751.06	109.77
AC032		AC032	76.0	76.0	76.0	Lw	76					3.00	r	6503800.05	1791731.11	107.84
AC033		AC033	76.0	76.0	76.0	Lw	76					3.00	r	6503835.40	1791712.26	105.83
AC034		AC034	76.0	76.0	76.0	Lw	76					3.00	r	6503871.60	1791690.51	104.75
AC035		AC035	76.0	76.0	76.0	Lw	76					3.00	r	6503798.17	1791683.27	109.59
AC036		AC036	76.0	76.0	76.0	Lw	76					3.00	r	6503731.49	1791723.80	113.73
AC037		AC037	76.0	76.0	76.0	Lw	76					3.00	r	6503762.83	1791702.12	108.88
AC038		AC038	76.0	76.0	76.0	Lw	76					3.00	r	6503835.49	1791664.78	107.88
AC039		AC039	76.0	76.0	76.0	Lw	76					3.00	r	6503868.71	1791646.85	106.25
AC040		AC040	76.0	76.0	76.0	Lw	76					3.00	r	6503660.47	1791573.38	113.77
AC041		AC041	76.0	76.0	76.0	Lw	76					3.00	r	6503697.48	1791552.54	111.35
AC042		AC042	76.0	76.0	76.0	Lw	76					3.00	r	6503736.51	1791532.85	109.75
AC043		AC043	76.0	76.0	76.0	Lw	76					3.00	r	6503774.48	1791513.62	107.74
AC044		AC044	76.0	76.0	76.0	Lw	76					3.00	r	6503921.62	1791483.23	106.00
AC045		AC045	76.0	76.0	76.0	Lw	76					3.00	r	6503935.00	1791514.12	106.00
AC046		AC046	76.0	76.0	76.0	Lw	76					3.00	r	6503955.55	1791546.96	106.00
AC047		AC047	76.0	76.0	76.0	Lw	76					3.00	r	6503974.12	1791578.13	105.71
AC048		AC048	76.0	76.0	76.0	Lw	76					3.00	r	6503992.91	1791614.51	104.76
AC049		AC049	76.0	76.0	76.0	Lw	76					3.00	r	6504005.26	1791645.34	103.94
AC050		AC050	76.0	76.0	76.0	Lw	76					3.00	r	6504024.05	1791681.73	103.30
AC051		AC051	76.0	76.0	76.0	Lw	76					3.00	r	6504039.85	1791715.86	102.83

Line Source(s)

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Operating Time			Moving Pt. Src			Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	Number	Speed			
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)		dB(A)		(min)	(min)	(min)	Day	Evening	Night	(mph)	(ft)

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL''			Lw / Li			Operating Time			Height
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	(ft)
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)		dB(A)		(min)	(min)	(min)	

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Barrier(s)

Name	Sel.	M.	ID	Absorption		Z-Ext.	Cantilever		Height		Coordinates			
				left	right		horz.	vert.	Begin	End	x	y	z	Ground
						(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Building(s)

Name	Sel.	M.	ID	RB	Residents	Absorption	Height	Coordinates			
							Begin	x	y	z	Ground
							(ft)	(ft)	(ft)	(ft)	(ft)

Ground Absorption(s)

Name	Sel.	M.	ID	G	Coordinates	
					x	y
					(ft)	(ft)

Vertical Area Source(s)

Name	ID	Height			Coordinates			
		Begin	End		x	y	z	Ground
		(ft)	(ft)		(ft)	(ft)	(ft)	(ft)

Rail

Name	Sel.	M.	ID	Lw'		Train Class	Correct.	Vmax
				Day	Night		Track	
				(dBA)	(dBA)		(dB)	(km(mph))

Sound Level Spectra

Name			ID	Type	Oktave Spectrum (dB)										Source		
					Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	

Roads

Name	Sel.	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflection		
				Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type		Drefl	Hbuild	Dist.
				(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(mph)	(mph)		(dB)		(%)	(dB)	(ft)	(ft)

RoadsGeo

Name	Height			Coordinates				Dist	LSlope
	Begin	End		x	y	z	Ground	(ft)	(%)
	(ft)	(ft)		(ft)	(ft)	(ft)	(ft)		

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APPENDIX 11.1:

CONSTRUCTION NOISE LEVEL CALCULATIONS

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15304 - Vista Cove

CadnaA Noise Prediction Model: 15304-07_Construction.cna

Date: 25.02.25

Analyst: B. Maddux

Calculation Configuration

Configuration	
Parameter	Value
General	
Max. Error (dB)	0.00
Max. Search Radius (ft)	6561.70
Min. Dist Src to Rcvr	0.00
Partition	
Raster Factor	0.50
Max. Length of Section (ft)	3280.80
Min. Length of Section (ft)	3.30
Min. Length of Section (%)	0.00
Proj. Line Sources	On
Proj. Area Sources	On
Ref. Time	
Daytime Penalty (dB)	0.00
Recr. Time Penalty (dB)	5.00
Night-time Penalty (dB)	10.00
DTM	
Standard Height (m)	7.00
Model of Terrain	Triangulation
Reflection	
max. Order of Reflection	2
Search Radius Src	328.08
Search Radius Rcvr	328.08
Max. Distance Source - Rcvr	3280.84 3280.84
Min. Distance Rcvr - Reflector	3.28 3.28
Min. Distance Source - Reflector	0.33
Industrial (ISO 9613 (1996))	
Lateral Diffraction	some Obj
Obst. within Area Src do not shield	On
Screening	Incl. Ground Att. over Barrier Dz with limit (20/25)
Barrier Coefficients C1,2,3	3.0 20.0 0.0
Temperature (°F)	50
rel. Humidity (%)	70
Ground Absorption G	0.50
Wind Speed for Dir. (mph)	6.7
Roads (TNM)	
Railways (FTA/FRA)	
Aircraft (???)	
Strictly acc. to AzB	

Receiver Noise Levels

Name	M.	ID	Level Lr			Limit. Value			Land Use			Height	Coordinates		
			Day	Night	CNEL	Day	Night	CNEL	Type	Auto	Noise Type		X	Y	Z
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)				(ft)	(ft)	(ft)	(ft)
R1		R1	59.3	-40.7	56.3	0.0	0.0	0.0		x	Total	5.00	r 6503195.07	1792238.17	203.86
R2		R2	61.8	-38.2	58.8	0.0	0.0	0.0		x	Total	5.00	r 6503356.55	1792236.21	186.21
R3		R3	65.0	-35.0	62.0	0.0	0.0	0.0		x	Total	5.00	r 6503526.26	1792261.78	171.00
R4		R4	60.1	-39.9	57.0	0.0	0.0	0.0		x	Total	5.00	r 6503537.30	1791883.32	168.35
R5		R5	59.4	-40.6	56.4	0.0	0.0	0.0		x	Total	5.00	r 6503448.24	1791631.50	172.00
R6		R6	53.3	-46.7	50.3	0.0	0.0	0.0		x	Total	5.00	r 6504520.65	1792550.76	54.26

Point Source(s)

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			Height	Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night		X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(ft)	(ft)	(ft)	(ft)

Line Source(s)

Name	M.	ID	Result. PWL			Result. PWL'			Lw / Li			Operating Time			Moving Pt. Src			Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	Number			Speed	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	Day	Evening	Night	(mph)	(ft)

Name	ID	Height			Coordinates			
		Begin	End		x	y	z	Ground
		(ft)	(ft)		(ft)	(ft)	(ft)	(ft)

Area Source(s)

Name	M.	ID	Result. PWL			Result. PWL"			Lw / Li			Operating Time			Height	
			Day	Evening	Night	Day	Evening	Night	Type	Value	norm.	Day	Special	Night	(ft)	
			(dBA)	(dBA)	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)		
CA1		CA1	116.6	16.6	16.6	69.6	-30.4	-30.4	PWL-Pt	116.6					8	r

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
CA1	CA1	8.00	r	6503210.20	1792311.50	193.08	185.08
				6503204.52	1792440.12	197.51	189.51
				6503742.16	1792343.49	160.28	152.28
				6504059.96	1792395.18	86.92	78.92
				6504303.45	1792284.95	78.29	70.29
				6503984.95	1791380.87	79.43	71.43
				6503930.15	1791412.37	84.08	76.08
				6503893.86	1791422.29	86.35	78.35
				6503802.39	1791431.35	92.34	84.34
				6503733.25	1791467.62	99.06	91.06
				6503645.53	1791502.94	108.75	100.75
				6503653.51	1792290.88	159.11	151.11
				6503438.72	1792290.09	172.88	164.88
				6503436.62	1792303.14	174.00	166.00
				6503427.30	1792308.87	174.00	166.00
				6503409.87	1792310.69	175.35	167.35

Barrier(s)

Name	Sel.	M.	ID	Absorption		Z-Ext.	Cantilever		Height		Coordinates			
				left	right		horz.	vert.	Begin	End	x	y	z	Ground
						(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Building(s)

Name	Sel.	M.	ID	RB	Residents	Absorption	Height		Coordinates			
							Begin		x	y	z	Ground
							(ft)		(ft)	(ft)	(ft)	(ft)

Ground Absorption(s)

Name	Sel.	M.	ID	G	Coordinates	
					x	y
					(ft)	(ft)

Vertical Area Source(s)

Name	ID	Height		Coordinates			
		Begin	End	x	y	z	Ground
		(ft)	(ft)	(ft)	(ft)	(ft)	(ft)

Rail

Name	Sel.	M.	ID	Lw'		Train Class	Correct.	Vmax
				Day	Night			
				(dBA)	(dBA)		(dB)	(km(mph))

Sound Level Spectra

Name		ID	Type	Oktave Spectrum (dB)										Source	
				Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin

Roads

Name	Sel.	M.	ID	Lme			Count Data		exact Count Data						Speed Limit		SCS	Surface		Gradient	Mult. Reflection		
				Day	Evening	Night	DTV	Str.class.	M			p (%)			Auto	Truck	Dist.	Dstro	Type		Dreff	Hbuild	Dist.
				(dBA)	(dBA)	(dBA)			Day	Evening	Night	Day	Evening	Night	(mph)	(mph)		(dB)		(%)	(dB)	(ft)	(ft)

RoadsGeo

Name	Height		Coordinates				Dist	LSlope
	Begin	End	x	y	z	Ground	(ft)	(%)
	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)		



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