East Highland Ranch - Alta Vista

NOISE IMPACT ANALYSIS

CITY OF HIGHLAND

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TABLE OF CONTENTS

APPENDICES

LIST OF EXHIBITS

LIST OF TABLES

LIST OF ABBREVIATED TERMS

(1)	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
INCE	Institute of Noise Control Engineering
L_{eq}	Equivalent continuous (average) sound level
L_{max}	Maximum level measured over the time interval
OPR	Office of Planning and Research
PPV	Peak particle velocity
Project	East Highland Ranch - Alta Vista
RMS	Root-mean-square
SBIA	San Bernardino International Airport
VdB	Vibration Decibels

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EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine the potential noise impacts and necessary noise control measures, if any, for the East Highland Ranch - Alta Vista ("Project"). The Project consists of the development of 113 single-family dwelling units on 12.5 acres. The Project site is located north of Greenspot Road at the intersection of Alta Vista in the City of Highland. The purpose of this noise analysis is to evaluate the potential noise impacts of the Project and determine if any noise control measures are necessary.

SUMMARY OF CEQA SIGNIFICANCE FINDINGS

The results of this Noise Impact Analysis are summarized below based on the significance criteria in Section 4 of this report, consistent with Appendix G of the California Environmental Quality Act (CEQA) Guidelines and the City of Highland noise standards. (1) Table ES-1 shows the findings of significance for each potential noise and/or vibration impact under CEQA before and after any required mitigation measures.

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
Offsite Noise	7	*Less Than Significant*	-
Onsite Noise[1]	8	-	-
Operational Noise	10	*Less Than Significant*	-
Construction Noise	11	*Less Than Significant*	-
Construction Vibration		*Less Than Significant*	-

- = not applicable.

[1] On-site noise impacts, i.e., impacts to the Project, are not the subject of CEQA.

EXTERIOR NOISE LEVELS

The Project includes 6-foot-high walls along Greenspot Road at lots 8, and Lots 103 to 109. The exterior noise levels will range from 47.3 to 64.8 dBA CNEL, which would be considered *conditionally acceptable* and would be below the 65 dBA CNEL threshold. Therefore, with the proposed barriers, the exterior noise levels would be *less than significant*.

INTERIOR NOISE ABATEMENT

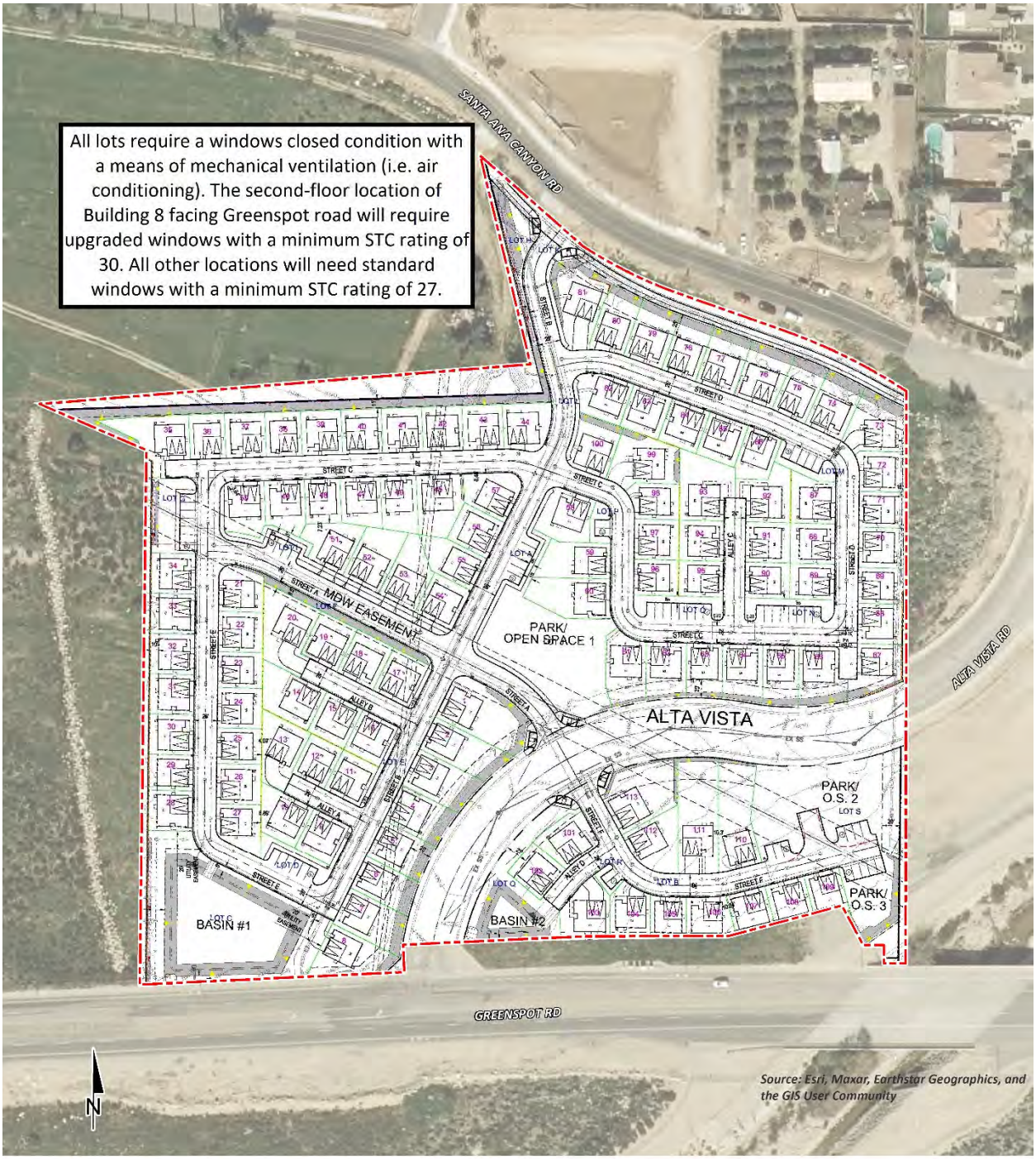
Due to façade noise levels, an interior noise level analysis is provided to demonstrate compliance with the City of Highland interior noise level policy standards. Based on the following analysis, first and second-floor receivers will range from 46.5 to 72.0 dBA CNEL. Typical building construction will provide a Noise Reduction (NR) of approximately 12 dBA with "windows open" and a minimum 25 dBA noise reduction with "windows closed." (2) (3) As discussed in Section 10, the Project will include air conditioners for each unit. Thus, the on-site analysis assumes mechanical ventilation is available for all units. The noise level analysis shows that the 45 dBA CNEL interior noise standards can be satisfied at all first-floor locations with the construction of

the recommended noise barrier, see Exhibit ES-A, using standard construction with a "windows-closed" condition. The interior noise level analysis also shows that the 45 dBA CNEL interior noise standard can be satisfied at all second-floor locations with standard construction with the exception of Lot 8, facing Greenspot Road; this unit will require upgraded windows/or glass doors. Therefore, to meet the State 45 dBA CNEL interior noise standards for residential land uses, the Project will provide the following or equivalent noise control measures:

- Windows & Glass Doors: The second floor of Lot 8, facing Greenspot Road, should be provided with well-fitted, well-weather-stripped assemblies that have a minimum sound transmission class (STC) ratings of 30.
- Walls: At any penetrations of exterior walls by pipes, ducts, or conduits, the space between the wall and pipes, ducts, or conduits shall be caulked or filled with mortar to form an airtight seal.
- Roof: Roof sheathing of wood construction shall be per manufacturer's specification or caulked plywood of at least one-half inch thick. Ceilings shall be per manufacturer's specification or well-sealed gypsum board of at least one-half inch thick. Insulation with at least a rating of R-19 shall be used in the attic space.
- Ventilation: Arrangements for any habitable room shall be such that any exterior door or window can be kept closed when the room is in use and still receive circulated air. A forced air circulation system (e.g. air conditioning) or active ventilation system (e.g. fresh air supply) shall be provided which satisfies the requirements of the Uniform Building Code.

With the interior noise abatement measures provided in this study, the Project is expected to satisfy the City of Highland 45 dBA CNEL interior noise level standards for residential development.

EXHIBIT ES-A: SUMMARY OF RECOMMENDATIONS



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1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of the East Highland Ranch - Alta Vista ("Project"). This noise study briefly describes the Project, provides information regarding noise fundamentals, sets out the local regulatory setting, presents the study methods and procedures for noise analysis, evaluates the future on-site noise environment, the future off-site Project-related traffic noise impacts, the potential Project-related long-term stationary-source operational noise impacts, as well as short-term construction noise and vibration impacts.

1.1 SITE LOCATION

The Project site is located north of Greenspot Road at the intersection of Alta Vista in the City of Highland, as shown in Exhibit 1-A. The Project is located 3.9 miles northeast of the San Bernardino International Airport. The nearest freeway, State Route 210 (SR-210), is located 2.7 miles west of the Project site. Residential land uses are located to the north of the Project site. The land immediately to the east, south, and west is undeveloped.

1.2 PROJECT DESCRIPTION

As shown in Exhibit 1-B, the Project is to consist of the development of 102 single-family residences. The on-site Project-related noise sources are expected to include: ground-mounted air conditioning units and parking lot activity. This noise analysis is intended to describe the noise level impacts associated with the expected typical operational activities at the Project site.

EXHIBIT 1-A: LOCATION MAP

EXHIBIT 1-B: SITE PLAN

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2 FUNDAMENTALS

Noise is 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 sources by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies which are audible to the human ear. Exhibit 2-A presents a summary of the typical noise levels and their subjective loudness and effects that are described in more detail below.

EXHIBIT 2-A: TYPICAL NOISE LEVELS

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

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

2.1 RANGE OF NOISE

Since the range of intensities that the human ear can detect is so large, the scale frequently used to measure intensity is a scale based on multiples of 10, the logarithmic scale. The scale for measuring intensity is the decibel scale. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud. (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 1,000 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 used metric is the equivalent level (L_{eq}). Equivalent sound levels are not measured directly but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level (L_{eq}) represents a steady-state sound level containing the same total energy as a time-varying signal over a given sample period and is commonly used to describe the "average" noise levels within the environment.

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

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

2.4 NOISE CONTROL

Noise control is the process of obtaining an acceptable noise environment for an observation point or receiver by controlling the noise source, transmission path, receiver, or all three. This concept is known as the source-path-receiver 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 receiver. Noise barriers, however, do have limitations. For a noise barrier to work, it must block the line-of-sight path of sound from the noise source.

2.6 LAND USE COMPATIBILITY WITH NOISE

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

2.7 COMMUNITY RESPONSE TO NOISE

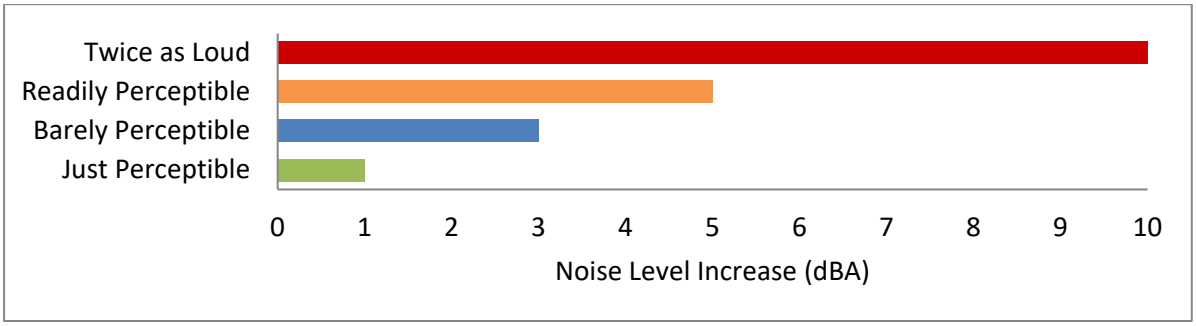
Community responses to noise may range from registering a complaint by telephone or letter, to initiating court action, depending upon everyone's susceptibility to noise and personal attitudes about noise. Several factors are related to the level of community annoyance including:

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

Approximately sixteen percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints may occur. Twenty to thirty percent of the population will not complain even in very severe noise environments. (9 pp. 8-6) Thus, a variety of reactions can be expected from people exposed to any given noise environment.

Surveys have shown that community response to noise varies from no reaction to vigorous action for newly introduced noises, averaging from 10 dB below existing to 25 dB above existing. (10) According to research originally published in the Noise Effects Handbook (9), the percentage of high annoyance ranges from approximately 0 percent at 45 dB or less, 10 percent are highly annoyed around 60 dB, and increases rapidly to approximately 70 percent being highly annoyed at approximately 85 dB or greater. Despite this variability in behavior on an individual level, the population can be expected to exhibit the following responses to changes in noise levels as shown on Exhibit 2-B. A change of 3 dBA is considered barely perceptible, and changes of 5 dBA are considered readily perceptible. (6)

EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION



2.8 VIBRATION

Per the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual*, 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 (10). 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 (10). In general, the heavier a building is, the lower the response will be to the incident vibration energy. However, all structurers reduce vibration levels due to the coupling of the building to the soil.

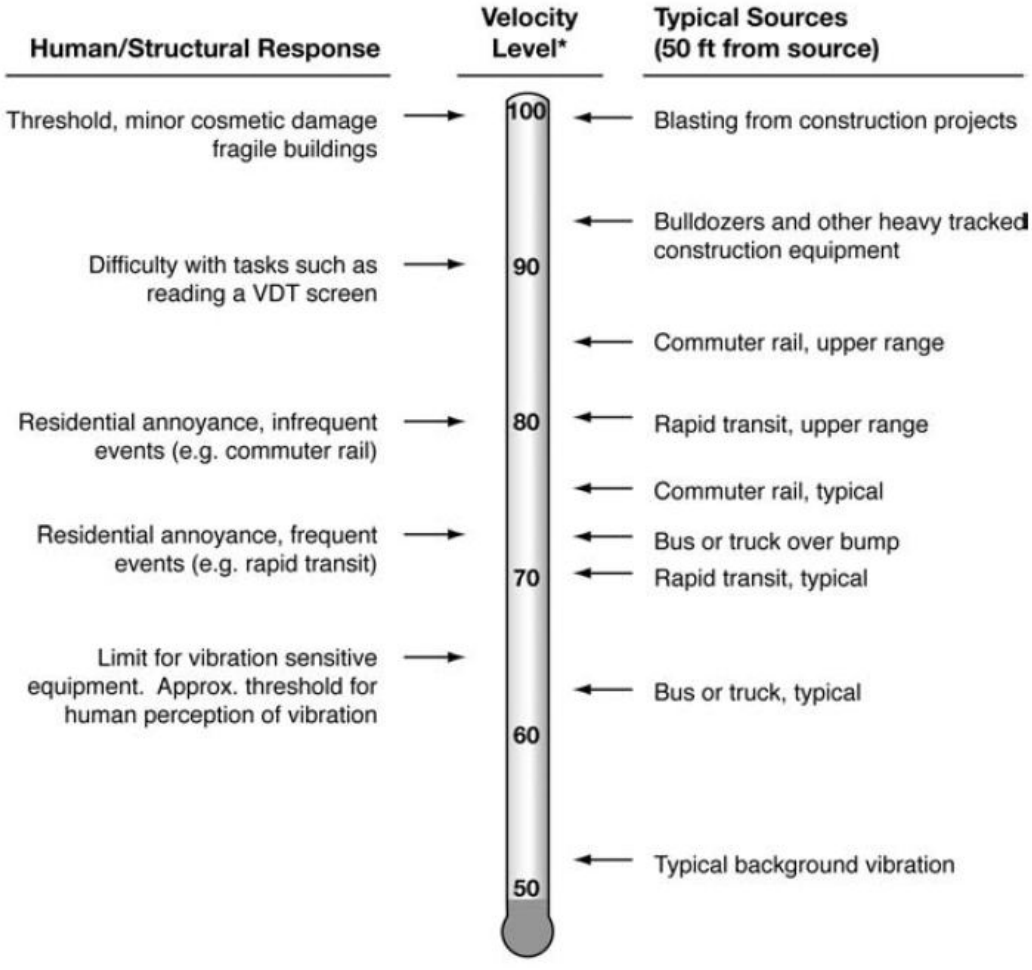
There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal (10). The PPV is most frequently used to describe vibration impacts on buildings but is not always suitable for evaluating human 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 (10). 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 (11). 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 (12). 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. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground-borne vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Exhibit 2-C illustrates common vibration sources and the human and structural response to ground-borne vibration.

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



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

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

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

CALIFORNIA ENVIRONMENTAL QUALITY ACT

The State of California regulates freeway noise, sets standards for sound transmission, provides occupational noise control criteria, identifies noise standards, and provides guidance for local land use compatibility. State law requires that each county and city adopt a General Plan that includes a Noise Element, which is to be prepared per guidelines adopted by the Governor's Office of Planning and Research (OPR). (13) 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.

CALIFORNIA BUILDING CODE – TITLE 24

The State of California's interior noise standards for all new construction with habitable spaces are codified in the California Code of Regulations (CCR), Title 24, Building Standards Administrative Code, Chapter 12, Section 1206. A habitable space in a building is defines as a space used for "living, sleeping, eating, or cooking. Bathrooms, toilet rooms, closets, halls, storage, or utility spaces and similar areas are not considered habitable spaces." These noise standards are primarily applicable to all new residential construction, inns, hotels, motels, and residential care facility land uses in California for controlling interior noise levels resulting from exterior noise sources. The acceptable interior noise limit is 45 CNEL in all habitable rooms (14).

3.2 CITY OF HIGHLAND GENERAL PLAN NOISE ELEMENT

The City of Highland has adopted a Noise Element of the General Plan to provide goals and strategies to ensure a quiet noise environment for residents, employees, and visitors to Highland. (15) To ensure a quiet noise environment, the City of Highland General Plan Noise Element contains the following goals:

7.1 Protect sensitive land uses and the citizens of Highland from annoying and excessive noise through diligent planning and regulation.

7.2 Encourage the reduction of noise from transportation-related noise sources such as automobile and truck traffic.

7.3 Protect residents from the effects of "spill over" or nuisance noise.

The Policies and Actions specified in the City of Highland Noise Element provide the guidelines necessary to satisfy these goals. For example, Goal 7.3, Action 1 indicates that construction, as a condition of approval, shall be limited to daytime hours between 7:00 a.m. to 6:00 p.m. on weekdays. (15) The City of Highland Noise Element (Table 7.3) identifies noise and land use guidelines to evaluate the land use compatibility of transportation related noise. The compatibility criteria, shown on Exhibit 3-A, provides the City with a planning tool to gauge the compatibility of land uses relative to existing and future exterior noise levels.

The *Community Noise and Land Use Compatibility* matrix describes categories of compatibility and not specific noise standards. The restaurant use of the Project is considered *normally acceptable* with unmitigated exterior noise levels of less than 70 dBA CNEL based on the *Commercial and Office Buildings* land use compatibility criteria shown on Exhibit 3-A. Residential designated land uses in the Project study area are considered *normally acceptable* with exterior noise levels below 60 dBA CNEL, and *conditionally acceptable* with exterior noise levels of up to 70 dBA CNEL. (15)

3.2.1 INTERIOR NOISE STANDARDS

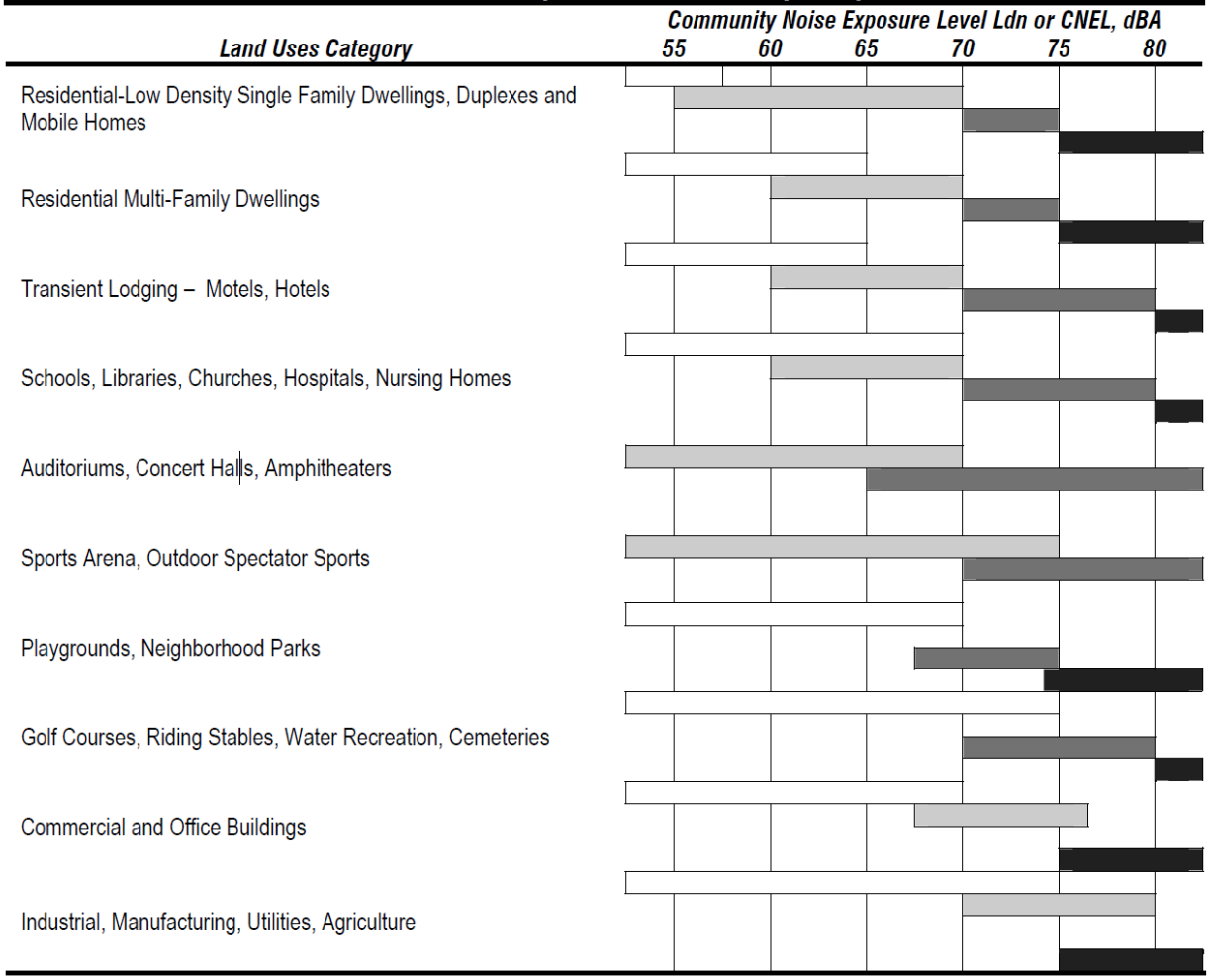
The interior noise level standards outlined in Table 7.1 in the City of Highland General Plan Noise Element do not reflect the Noise Control provisions outlined in the currently adopted Municipal Code. Therefore, this analysis relies on the State of California Building Code, Title 24, to assess the Project's interior noise level standards. Section 1206.4, of the California Building Code establishes the interior noise level standard for residential land uses at 45 dBA CNEL.

3.3 CITY OF HIGHLAND MUNICIPAL CODE STANDARDS

To analyze noise impacts originating from a designated fixed location or private property such as the Project, stationary-source (operational) noise levels such as the expected ground-mounted air conditioning units and parking lot activity, as well as noise from construction activities are typically evaluated against standards established under the City's Municipal Code. However, the currently adopted City of Highland Municipal Code included in Appendix 3.1 does not identify any quantifiable exterior noise level standards for non-transportation (stationary) noise sources. The 24-hour Community Noise Equivalent Levels (CNEL) outlined in Tables 7.1 and 7.2 in the City of Highland General Plan Noise Element do not reflect the Noise Control provisions outlined in the currently adopted Municipal Code. Therefore, this analysis relies on the County of San Bernardino Development Code noise standards to assess the Project-related operational stationary source noise levels.

EXHIBIT 3-A: COMMUNITY NOISE AND LAND USE COMPATIBILITY

Table 7.3: Community Noise and Land Use Compatibility



Explanatory Notes

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

Conditionally Acceptable:
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply system or air conditioning will normally suffice. Outdoor environment will seem noisy.

Normally Unacceptable:
New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made with needed noise insulation features included in the design. Outdoor areas must be shielded.

Clearly Unacceptable:
New construction or development should generally not be undertaken. Construction cost to make the indoor environment acceptable would be prohibitive and the outdoor environment would not be usable.

Title 8, Section 83.01.080(c) of the County of San Bernardino Development Code establishes the noise level standards for stationary noise sources. Since the Project's land use will potentially impact adjacent noise-sensitive uses in the Project study area, this noise study relies on the residential noise level standards to describe Project-related operational noise impacts. For residential properties, the exterior noise level shall not exceed 55 dBA L_{eq} during the daytime hours (7:00 a.m. to 10:00 p.m.) and 45 dBA L_{eq} during the nighttime hours (10:00 p.m. to 7:00 a.m.) for both the whole hour, and for not more than 30 minutes in any hour. (16)

The exterior noise level standards shall apply for a cumulative period of 30 minutes in any hour, as well as the standard plus 5 dBA cannot be exceeded for a cumulative period of more than 15 minutes in any hour, or the standard plus 10 dBA for a cumulative period of more than 5 minutes in any hour, or the standard plus 15 dBA for a cumulative period of more than 1 minute in any hour, or the standard plus 20 dBA for any period of time. Further, Section 83.01.080(e) indicates that if the existing ambient noise level already exceeds any of the exterior noise level limit categories, then the standard shall be adjusted to reflect the ambient conditions. The County of San Bernardino operational noise level standards are shown in Table 3-1 and included in Appendix 3.2.

TABLE 3-1: OPERATIONAL NOISE LEVEL STANDARDS

Time Period	Exterior Noise Level Standards (dBA)[1]				
	L_{50} (30 mins)	L_{25} (15 mins)	L_8 (5 mins)	L_2 (1 min)	L_{max} (Anytime)
Daytime (7:00 a.m. to 10:00 p.m.)	55	60	65	70	75
Nighttime (10:00 p.m. to 7:00 a.m.)	45	50	55	60	65

[1] County of San Bernardino Development Code, Title 8, Section 83.01.080 (Appendix 3.2). The percent noise level is the level exceeded "n" percent of the time during the measurement period. L_{50} is the noise level exceeded 50% of the time. .

The percentile noise descriptors are provided to ensure that the duration of the noise source is fully considered. However, due to the relatively constant intensity of the Project operational activities, the L_{50} or average L_{eq} noise level metrics best describe the ground-mounted air conditioning units and parking lot activity. In addition, the L_{eq} noise level metric accounts for noise fluctuations over time by averaging the louder and quieter events and giving more weight to the louder events. In addition, due to the mathematical relationship between the median (L_{50}) and the mean (L_{eq}), the L_{eq} will always be larger than or equal to the L_{50}. The more variable the noise becomes, the larger the L_{eq} becomes in comparison to the L_{50}. Therefore, this noise study conservatively relies on the average L_{eq} sound level limits to describe the Project operational noise levels.

3.4 CONSTRUCTION NOISE STANDARDS

The City of Highland General Plan Noise Element, Goal 7.3, Action 1 indicates that construction, as a condition of approval, shall be limited to daylight hours between 7:00 a.m. to 6:00 p.m. (15) However, neither the City's General Plan nor Municipal Code establish numeric maximum acceptable construction source noise levels at potentially affected receivers, which would allow

for a quantified determination of what CEQA constitutes a *substantial temporary or periodic noise increase*. Therefore, a numerical construction threshold based on Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual* is used for analysis of daytime construction impacts, as discussed below.

According to the FTA, local noise ordinances are typically not very useful in evaluating construction noise. They usually relate to nuisance and hours of allowed activity and sometimes specify limits in terms of maximum levels, but are generally not practical for assessing the impact of a construction project. Project construction noise criteria should account for the existing noise environment, the absolute noise levels during construction activities, the duration of the construction, and the adjacent land use. Due to the lack of standardized construction noise thresholds, the FTA provides guidelines that can be considered reasonable criteria for construction noise assessment. The FTA considers a daytime exterior construction noise level of 80 dBA L_{eq} as a reasonable threshold for noise-sensitive residential land use. (10)

3.5 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. (10) To analyze vibration impacts originating from the operation and construction of the Project, vibration-generating activities are appropriately evaluated against standards established under a City's Municipal Code, if such standards exist. However, the City of Highland does not identify specific vibration level limits. Therefore, for analysis purposes, the Caltrans *Transportation and Construction Vibration Guidance Manual*, (11 p. 38) Table 19, vibration damage are used in this noise study to assess potential temporary construction-related impacts at adjacent building locations. The nearest noise sensitive 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).

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4 SIGNIFICANCE CRITERIA

The following significance criteria are based on currently adopted guidance provided by Appendix G of the State CEQA Guidelines. (17) 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?

4.1 NOISE LEVEL INCREASES (THRESHOLD A)

Noise level increases resulting from the Project are evaluated based on the Appendix G CEQA Guidelines. Under CEQA, consideration must be given to the magnitude of the increase, the existing baseline ambient noise levels, and the location of 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.* (18) This is primarily because of the wide variation in individual thresholds of annoyance and differing individual experiences with noise. In general, the more a new noise level exceeds the previously existing ambient noise level, the less acceptable the new noise level will typically be judged. 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. The *ambient noise level* is the composite of noise from all sources, excluding the alleged offensive noise. In this context, it represents the normal or existing level of environmental noise at a given location for a specified time of day or night.

4.1.1 TRANSPORTATION NOISE (SUBSTANTIAL PERMANENT NOISE LEVEL INCREASE)

The Federal Interagency Committee on Noise (FICON) (19) 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 a noise impact significant*, based on a 2008 California Court of Appeal ruling on Gray v. County of Madera. (18) 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, a *readily perceptible* 5 dBA or greater

project-related noise level increase is considered a significant impact when the without project noise levels are below 60 dBA. 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 permanent increase in baseline 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 (baseline) 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 at noise sensitive receiver locations are consistent with guidance provided by both the Federal Highway Administration (6 p. 9) and Caltrans (4).

The City of Highland General Plan Noise Element, *Noise Compatibility by Land Use Type* was used to establish the satisfactory noise levels of significance for non-noise-sensitive land uses in the Project study area. As previously shown on Exhibit 3-A, the *completely compatible* exterior noise level for non-noise-sensitive land uses is 70 dBA CNEL. To determine if Project-related traffic noise level increases are significant at off-site non-noise-sensitive land uses, a *barely perceptible* 3 dBA criteria is used. When the without Project noise levels are greater than the *completely compatible* 70 dBA CNEL land use compatibility criteria, a *barely perceptible* 3 dBA or greater noise level increase is considered a significant impact since the noise level criteria is already exceeded. The noise level increases used to determine significant impacts for non-noise-sensitive land uses is generally consistent with the FICON noise level increase thresholds for noise-sensitive land uses but instead rely on the City of Highland General Plan Noise Element, *Noise Compatibility by Land Use Type completely compatible* 70 dBA CNEL exterior noise level criteria.

4.1.2 Non-Transportation Noise (Substantial Permanent Noise Level Increase)

The FICON criteria are also used to determine if Project-related stationary source (operational) noise level increases are significant at off-site receiver locations. For non-transportation noise source activities, a substantial permanent noise level increase consists of increases of 5 dBA or *readily perceptible*, 3 dBA or *barely perceptible*, and 1.5 dBA depending on the underlying ambient noise levels.

4.1.3 Construction Noise (Substantial Temporary Noise Level Increase)

In addition to absolute noise limits, the temporary noise level increases over the existing ambient conditions must be considered under CEQA Significance Threshold A. Recent court cases have also placed an emphasis on the increase as opposed to the noise level limit. However, limits and

acceptable increases are not unrelated since, often, the noise level limits can subtly include the increase limit.

While specific noise ordinances can vary widely, many jurisdictions across California set construction noise level limits around 75 to 80 dBA L_{eq} and only allow construction during daytime hours (e.g., City and County of Los Angeles, City and County of San Diego, City and County of San Francisco, etc.) In contrast, everyday noise limits are stricter because they apply to continuous, long-term activities where excessive noise can greatly affect the quality of life over time. Thus, for everyday noise limits, many jurisdictions across California set residential daytime noise level limits around 55 dBA L_{eq} during daytime hours. This implies that during daytime hours, many California communities consider an increase of 20 dBA over the daytime limit an acceptable temporary increase for construction activities. This is also illustrated in the adoption of many CEQA documents statewide that use an 80 dBA L_{eq} limit for assessing construction impacts while using everyday noise level limits of local noise ordinances in assessing on-site operational impacts.

However, since an increase of 20 dBA could result in noise levels over 85 dBA L_{eq}, which the California Occupational Safety and Health Administration (CalOSHA) identifies as a potentially hazardous noise level, the increase should not be allowed to result in an absolute noise level greater than 80 dBA Leq at any residence, which is consistent with the FTA recommendations.

Therefore, if the Project-related construction noise levels generate a temporary noise level increase over the existing daytime ambient noise levels in excess of 20 dBA L_{eq}, and exceed 80 dBA L_{eq}, then the Project construction noise level increases will be considered a *significant* impact.

4.2 VIBRATION (THRESHOLD B)

As described in Section 3.6, the vibration impacts are appropriately evaluated using the Caltrans vibration damage thresholds to assess potential temporary construction-related impacts at adjacent building locations. The nearest noise sensitive 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).

4.3 CEQA GUIDELINES NOT FURTHER ANALYZED (THRESHOLD C)

CEQA Noise Threshold C applies when there are nearby public and private airports and/or airstrips and focuses on land use compatibility of the Project to nearby airports and airstrips. The Project site is not located within two miles of an airport or airstrip. The closest airport is the San Bernardino International Airport (SBD), located roughly 3.89 miles southwest of the Project site. As such, the Project site would not be exposed to excessive noise levels from airport operations, and therefore, impacts are considered *less than significant,* and no further noise analysis is conducted in relation to Appendix G to the CEQA Guidelines, Noise Threshold C.

4.4 SIGNIFICANCE CRITERIA SUMMARY

Noise impacts shall be considered significant if any of the following occur as a direct result of the proposed development. Table 4-1 shows the significance criteria summary matrix that includes the allowable criteria used to identify potentially significant incremental noise level increases.

TABLE 4-1: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Condition(s)	Significance Criteria	
		Daytime	Nighttime
Onsite	Interior Noise Level Standards[1]	45 dBA CNEL	
	Exterior Noise Level Standards[2]	65 dBA CNEL	
Offsite	If ambient is < 60 dBA Leq[3]	≥ 5 dBA L_{eq} Project increase	
	If ambient is 60 - 65 dBA Leq[3]	≥ 3 dBA L_{eq} Project increase	
Operational	Exterior Noise Level Standards[4]	55 dBA L_{eq}	45 dBA L_{eq}
	If ambient is < 60 dBA Leq[3]	≥ 5 dBA L_{eq} Project increase	
	If ambient is 60 - 65 dBA Leq[3]	≥ 3 dBA L_{eq} Project increase	
Construction	Limited to daylight hours between 7:00 a.m. to 6:00 p.m[5]		
	Noise Level Threshold[6]	80 dBA L_{eq}	
	Noise Level Increase	20 dBA L_{eq}	
	Vibration Level Threshold[7]	0.3 PPV (in/sec)	

[1] County of San Bernardino Development Code, Title 8, Section Table 83-3 (Appendix 3.2)
[2] City of Highland Goal 7.1, Policy 5
[3] FICON, 1992.
[4] County of San Bernardino Development Code, Title 8, Section 83.01.080 (Appendix 3.2)
[5] City of Highland General Plan Noise Element, Goal 7.3, Action 1
[6] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual.
7 Caltrans Transportation and Construction Vibration Manual, April 2020 Table 19.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, 24-hour noise level measurements were taken at four locations in the Project study area. The receiver locations were selected to describe and document the existing noise environment within the Project study area. Exhibit 5-A provides the boundaries of the Project study area and the noise level measurement locations. To fully describe the existing noise conditions, noise level measurements were collected by Urban Crossroads, Inc. on Tuesday, June 26, 2024. Appendix 5.1 includes study area photos.

5.1 MEASUREMENT PROCEDURE AND CRITERIA

To describe the existing noise environment, the hourly noise levels were measured during typical weekday conditions over a 24-hour period. By collecting individual hourly noise level measurements, it is possible to describe the daytime and nighttime hourly noise levels and calculate the 24-hour CNEL. The long-term noise readings were recorded using Piccolo Type 2 integrating sound level meter and dataloggers. The Piccolo sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 150. All noise meters were programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (20)

5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned as close to the nearest sensitive receiver locations as possible to assess the existing ambient hourly noise levels surrounding the Project site. Both Caltrans and the FTA recognize that it is not reasonable to collect noise level measurements that can fully represent every part of a private yard, patio, deck, or balcony normally used for human activity when estimating impacts for new development projects. This is demonstrated in the Caltrans general site location guidelines which indicate that, *sites must be free of noise contamination by sources other than sources of interest. Avoid sites located near sources such as barking dogs, lawnmowers, pool pumps, and air conditioners unless it is the express intent of the analyst to measure these sources*. (4) Further, FTA guidance states, t*hat it is not necessary nor recommended that existing noise exposure be determined by measuring at every noise-sensitive location in the project area. Rather, the recommended approach is to characterize the noise environment for clusters of sites based on measurements or estimates at representative locations in the community*. (10)

Based on recommendations of Caltrans and the FTA, it is not necessary to collect measurements at each individual building or residence, because each receiver measurement represents a group of buildings that share acoustical equivalence. (10) In other words, the area represented by the receiver shares similar shielding, terrain, and geometric relationship to the reference noise source. Receivers represent a location of noise sensitive areas and are used to estimate the future noise level impacts. Collecting reference ambient noise level measurements at the nearby sensitive receiver locations allows for a comparison of the before and after Project noise levels

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

5.3 NOISE MEASUREMENT RESULTS

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

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

Location[1]	Description	Energy Average Noise Level (dBA L_{eq})[2]	
		Daytime	Nighttime
L1	Located west of the site near the residence at 7914 Calle Del Rio St.	70.7	66.7
L2	Located north of the site near the residence at 7796 Alta Vista	58.9	54.5
L3	Located northwest of the site near the residence at 29894 Santa Ana Canyon Rd.	51.1	44.3
L4	Located northeast of the site near the residence at 7735 Henslee Dr.	55.2	49.4

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

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

EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS

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6 TRAFFIC NOISE METHODS AND PROCEDURES

The following section outlines the methods and procedures used to estimate and analyze the future traffic noise environment. Consistent with the City of Highland *Land Use Compatibility* guidelines and all transportation-related noise levels are presented in terms of the 24-hour CNEL.

6.1 FHWA TRAFFIC NOISE PREDICTION MODEL

The expected roadway noise level increases from vehicular traffic were calculated by Urban Crossroads, Inc. 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 conditions ("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. Research conducted by Caltrans has shown that the use of soft site conditions is appropriate for the application of the FHWA traffic noise prediction model used in this analysis. (23)

6.2 ON-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

The on-site roadway parameters, including the average daily traffic (ADT) volumes used for this study, are presented in Table 6-1. To describe future traffic conditions, the design capacity ADTs based on roadway classification were used. The traffic volumes shown in Table 6-1 reflect future long-range traffic conditions needed to assess the future on-site traffic noise environment and to identify the appropriate noise mitigation measures, if any, that address the worst-case future conditions.

TABLE 6-1: ON-SITE ROADWAY PARAMETERS

Roadway Segment	Lanes	Classification[1]	Daily Capacity Volume[2]	Speed Limit (mph)[3]	Site Conditions
Greenspot Rd.	4	Major Highway	20,000	55	Soft
Alta Vista	2	Collector	1,000	25	Soft
Santa Ana Canyon Rd.	2	Collector	1,000	25	Soft

[1] Road classifications based upon the City of Highland General Plan Circulation Element.
[2] Typical ADT for Major Highway and Collector.
[3] Posted speed limits on each roadway.

Table 6-2 presents the time-of-day vehicle splits by vehicle type, and Table 6-3 presents the total traffic flow distributions (vehicle mixes) used for this analysis. 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.

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: Typical Southern California vehicle mix.

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

Roadway Classification	Total % Traffic Flow[1]			Total
	Autos	Medium Trucks	Heavy Trucks	
All Roadways	97.42%	1.84%	0.74%	100.00%

[1] Source: Typical Southern California 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 site plan showing the plotting of each building in relationship to adjacent analyzed roadways, as shown in Appendix 6.1. The plans are used to identify the relationship between the roadway centerline elevation, the pad elevation, and the centerline distance to the noise barrier and the building façade. The first-floor exterior noise level receivers were placed five feet above the pad elevation. Second-floor receiver locations were placed at fourteen feet above the pad elevation.

7 OFF-SITE TRANSPORTATION NOISE IMPACTS

The Project would result in a small increase in regional and local traffic volumes. The Project is anticipated to generate a maximum of 1,066 two-way trip-ends per day (24). Greenspot Road is classified as a Major Highway with a typical roadway volume of 20,000 ADT. The increase of 5.3 percent in traffic volumes would represent a less than 1 dba CNEL increase, which is not expected to generate a perceptible noise level increase at nearby sensitive land uses adjacent to study area roadways. Therefore, the off-site traffic noise levels generated by the Project are considered *less than significant*.

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8 ON-SITE NOISE ANALYSIS

An on-site exterior noise impact analysis has been completed to determine the noise exposure levels that would result from adjacent transportation noise sources in the Project study area and to identify potential noise attenuation measures that would achieve acceptable exterior and interior noise levels at the Project site. Under Goal 7.1, the City identifies policy 5, which states, in part, "*Prevent the siting of sensitive uses in areas in excess of established 65 dBA CNEL without appropriate mitigation….*" Thus, the on-site exterior noise analysis uses the goal of 65 CNEL as the noise level at which noise control measures would be recommended. As indicated in Section 3.2.1, this analysis uses the California Building Code residential interior noise level standard of 45 CNEL to determine if noise control design measures are necessary to achieve acceptable interior noise levels. The primary source of transportation noise affecting the Project site is anticipated to be from Greenspot Road, Alta Vista, and Santa Ana Canyon Road. Exhibit 8-A identifies the lots that are examined as part of the on-site noise analysis.

8.1 ON-SITE TRAFFIC NOISE ANALYSIS

Using the FHWA traffic noise prediction model and the parameters outlined in Tables 6-1 to 6-3, and including the proposed wall along Greenspot Road, the future on-site exterior noise levels were predicted. Table 8-1 summarizes future on-site exterior traffic noise levels at the private outdoor areas (i.e., backyards) within the Project site. The on-site traffic noise analysis calculations are provided in Appendix 8.1.

TABLE 8-1: EXTERIOR TRAFFIC NOISE LEVELS

Receiver Location	Roadway	Mitigated Noise Level (dBA CNEL)	Barrier Height (ft)	Threshold Exceeded?
Lot 8	Greenspot Rd.	64.8	6	No
Lots 103-109	Greenspot Rd.	62.3	6	No
Lots 1-7, 61-66, 101-102, 113	Alta Vista	51.4	0	No
Lots 67-72	Alta Vista	47.3	0	No
Lots 73-80	Santa Ana Canyon Rd.	50.7	0	No
Lot 81	Santa Ana Canyon Rd.	51.6	0	No

8.2 EXTERIOR NOISE LEVEL COMPATIBILITY

The on-site exterior traffic noise analysis indicates that on-site locations will experience exterior noise levels ranging from 47.3 to 64.8 dBA CNEL from all transportation sources. Therefore, exterior noise levels would be less than the acceptable noise level of 65 dBA CNEL, and noise levels would comply with the City of Highland exterior noise level policies.

EXHIBIT 8-A: ON-SITE LOT LOCATIONS

8.3 INTERIOR NOISE ANALYSIS

To ensure that the interior noise levels comply with the interior noise level standards, exterior noise levels were calculated at the first- and second-floor building façade locations.

8.3.1 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." (6) (3) Mechanical ventilation/air conditioning would be necessary for a “windows-closed” condition. However, sound leaks, cracks, and openings within the building 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] acoustically upgraded windows, and [3] removing cut-outs or openings in exterior wall/roof assemblies.

8.3.2 INTERIOR NOISE LEVEL ASSESSMENT

As analyzed in Section 10, mechanical ventilation will be provided. Since the Project is providing each unit with mechanical ventilation in the form of air conditioning, all buildings are assumed to have a “windows-closed” condition for the evaluation of interior noise levels.

Table 8-2 shows that, with the recommended noise barrier, the future traffic noise levels at the first-floor building façades are expected to range from 46.5 to 64.0 dBA CNEL. The interior noise assessment shows that the State interior noise level standard can be satisfied using standard construction.

Table 8-3 shows that the future traffic noise levels at the second-floor building façades are expected to range from 46.5 to 72.0 dBA CNEL. The interior noise assessment shows that the State interior noise level standard can be satisfied at all units using standard construction, with the exception of Lot 8. The second floor of Lot 8 will require upgraded windows with a minimum STC rating of 30.

8.3.3 INTERIOR TRAFFIC NOISE LEVEL COMPLIANCE

Tables 8-2 and 8-3 show that, with the exception of units on Lot 8, on-site interior traffic noise levels will not exceed the 45 dBA CNEL interior noise level standard for residential land uses at any unit. With upgraded windows with a minimum STC rating of 30 for the second floor of Lot 8, will comply with the State interior noise level standard.

TABLE 8-2: FIRST FLOOR INTERIOR NOISE LEVELS (CNEL)

Receiver Location	Noise Level at Façade[1]	Required Interior Noise Reduction[2]	Estimated Interior Noise Reduction[3]	Upgraded Windows[4]	Recommended STC	Interior Noise Level[5]
Lot 8	64.0	19.0	25.0	No	27	39.0
Lots 103-109	61.9	16.9	25.0	No	27	36.9
Lots 1-7, 61-66, 101-102, 113	50.1	5.1	25.0	No	27	25.1
Lots 67-72	46.5	1.5	25.0	No	27	21.5
Lots 73-80	49.5	4.5	25.0	No	27	24.5
Lot 81	50.2	5.2	25.0	No	27	25.2

[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] A minimum of 25 dBA noise reduction is assumed with standard building construction; 12 dBA assumes open windows.
[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.

TABLE 8-3: SECOND FLOOR INTERIOR NOISE LEVELS (CNEL)

Receiver Location	Noise Level at Façade[1]	Required Interior Noise Reduction[2]	Estimated Interior Noise Reduction[3]	Upgraded Windows[4]	Recommended STC	Interior Noise Level[5]
Lot 8	72.0	27.0	25.0	Yes	30	44.0
Lots 103-109	68.9	23.9	25.0	No	27	43.9
Lots 1-7, 61-66, 101-102, 113	50.0	5.0	25.0	No	27	25.0
Lots 67-72	46.5	1.5	25.0	No	27	21.5
Lots 73-80	49.4	4.4	25.0	No	27	24.4
Lot 81	50.1	5.1	25.0	No	27	25.1

[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] A minimum of 25 dBA noise reduction is assumed with standard building construction; 12 dBA assumes open windows.
[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.
[6] Receiver location represents a less than two-story building.

9 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, out-patient clinics, cemeteries, golf courses, country clubs, athletic/tennis clubs, and equestrian clubs. Land uses that are considered relatively insensitive to noise include business, commercial, and professional developments. Land uses that are typically not affected by noise include: industrial, manufacturing, utilities, agriculture, undeveloped land, parking lots, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals.

To describe the potential off-site Project noise levels, four 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 residence at 7914 Calle Del Rio Street, approximately 2,036 feet east of the Project site. R1 is placed in the private outdoor living areas (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L1, to describe the existing ambient noise environment.

R2: Location R2 represents the existing noise sensitive residence at 7796 Alta Vista, approximately 118 feet north of the Project site. R2 is placed in the private outdoor living areas (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L2, to describe the existing ambient noise environment.

R3: Location R3 represents the existing noise sensitive residence at 29894 Santa Ana Canyon Road, approximately 334 feet northwest of the Project site. R3 is placed at the building façade facing the Project site. A 24-hour noise measurement was taken near this location, L3, to describe the existing ambient noise environment.

R4: Location R4 represents the existing noise sensitive residence at 7735 Henslee Drive, approximately 652 feet northwest of the Project site R4 is placed in the private outdoor living areas (backyard) facing the Project site. A 24-hour noise measurement was taken near this location, L4, to describe the existing ambient noise environment.

EXHIBIT 9-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 (i.e., on-site) operational noise impacts at the nearest existing off-site receiver locations, identified in Section 9, resulting from the operation of the Project. Exhibit 10-A identifies the 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 daytime and nighttime activities at the Project site. The on-site Project-related noise sources are expected to include: ground-mounted air conditioning units and parking lot activity.

10.2 REFERENCE NOISE LEVELS

To estimate the Project operational noise impacts, reference noise level measurements were collected from similar types of activities and events, or from published noise level data to represent the noise levels expected with the development of the Project. This section provides a description of the reference noise level measurements shown on Table 10-1 used to estimate the Project operational noise impacts.

10.2.1 GROUND MOUNTED 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- to 5-ton residential packaged air conditioning unit (Carrier 50VR-A). The manufacturer's specifications are included in Appendix 10.1. At a uniform reference distance of 50 feet, the units would generate a reference noise level of 44.4 dBA L_{eq}. The air conditioning units were modeled 5 feet above the ground, operating 39 minutes per hour during the daytime and 28 minutes at nighttime, which represents the typical maximum operating time for properly sized AC systems.

10.2.2 PARKING LOT VEHICLE MOVEMENTS

Parking activities are based on the area of the parking spaces. The Project includes approximately 60 new spaces, which are assumed to have up to 2 movements per hour for a total of 120 events in an hour. Based on studies conducted in Europe and Australia, the average parking procedure, which included movement associated with either entering or exiting the parking area, parking the vehicles, and opening and closing doors resulted in a sound power level of approximately 87.8 dBA Lw/square meter per event (25) (26).

EXHIBIT 10-A: OPERATIONAL NOISE SOURCE LOCATIONS

LEGEND:

N

Site Boundary | Ground Mounted Air Conditioning Unit | Parking Lot Vehicle Movements

TABLE 10-1: REFERENCE NOISE LEVEL MEASUREMENTS

Noise Source	Noise Source Height (Feet)	Min./Hour[1]		Reference Noise Level @50 feet (dBA L_{eq})	Sound Power Level (dBA)[2]
		Day	Night		
Air Conditioning Units	5'	39	28	44.4	76.0
Parking Lot Vehicle Movements	0'	60	30	56.1	87.8

[1] Anticipated duration (minutes within the hour) of noise activity during typical hourly conditions expected at the Project site. "Day" = 7:00 a.m. to 10:00 p.m.; "Night" = 10:00 p.m. to 7:00 a.m.

[2] 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.

10.3 CADNAA 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 9613-2 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 the noise level at each receiver and the partial noise level contributions by noise source. Consistent with the ISO 9613-2 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 10.2 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 Project operations that include ground-mounted air conditioning units and parking lot activity, 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 from 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 19.3 to 36.6 dBA L_{eq}.

TABLE 10-2: DAYTIME PROJECT OPERATIONAL NOISE LEVELS

Noise Source[1]	Operational Noise Levels by Receiver Location (dBA Leq)			
	R1	R2	R3	R4
Air Conditioning Units	18.7	36.4	29.1	25.0
Parking Lot Vehicle Movements	10.6	22.5	19.6	17.3
Total (All Noise Sources)	**19.3**	**36.6**	**29.6**	**25.7**

[1] See Exhibit 10-A for the noise source locations. CadnaA noise model calculations are included in Appendix 10.1.

Table 10-3 shows the Project operational noise levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. The nighttime hourly noise levels at the off-site receiver locations are expected to range from 16.5 to 33.8 dBA L_{eq}. The differences between the daytime and nighttime noise levels are largely related to the estimated duration of noise activity, as shown in Table 10-1 and Appendix 10.2.

TABLE 10-3: NIGHTTIME PROJECT OPERATIONAL NOISE LEVELS

Noise Source[1]	Operational Noise Levels by Receiver Location (dBA Leq)			
	R1	R2	R3	R4
Air Conditioning Units	16.0	33.7	26.3	22.3
Parking Lot Vehicle Movements	6.7	18.5	15.7	13.3
Total (All Noise Sources)	**16.5**	**33.8**	**26.7**	**22.8**

[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 Highland exterior noise level standards at the nearest noise-sensitive receiver locations. Table 8-4 shows the operational noise levels associated with the Project will satisfy the City of Highland daytime and nighttime exterior noise level standards adjusted to reflect the ambient noise levels at all nearest receiver locations. Therefore, the operational noise impacts are considered *less than significant* at the nearest noise-sensitive receiver locations.

TABLE 10-4: OPERATIONAL NOISE LEVEL COMPLIANCE

Receiver Location[1]	Project Operational Noise Levels (dBA Leq)[2]		Noise Level Standards (dBA Leq)		Noise Level Standards Exceeded?[3]	
	Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime
R1	19.3	16.5	70.7	66.7	No	No
R2	36.6	33.8	58.9	54.5	No	No
R3	29.6	26.7	51.1	44.3	No	No
R4	25.7	22.8	55.2	49.4	No	No

[1] See Exhibit 9-A for the receiver locations.
[2] Project operational noise levels as shown in Tables 10-2 and 10-3.
[3] 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.

10.6 PROJECT OPERATIONAL NOISE LEVEL INCREASES

To describe the Project operational noise level increases, the Project operational noise levels are combined with the existing ambient noise level measurements for the nearest receiver locations potentially impacted by Project operational noise sources. Since the units used to measure noise, decibels (dB), are logarithmic units, the Project-operational, and existing ambient noise levels cannot be combined using standard arithmetic equations. (4) Instead, they must be logarithmically added using the following base equation:

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

Where "SPL1," "SPL2," etc. are equal to the sound pressure levels being combined, or in this case, the Project-operational and existing ambient noise levels. The difference between the combined Project and ambient noise levels describes the Project noise level increases to the existing ambient noise environment. Noise levels that would be experienced at receiver locations when Project-source noise is added to the daytime and nighttime ambient conditions are presented on Tables 10-5 and 10-6, respectively.

As indicated in Tables 10-5, the Project will generate daytime operational noise level increases ranging up to less than 0.1 dBA L_{eq} at the nearest receiver locations. Table 10-6 shows that the Project will generate nighttime operational noise level increases ranging up to 0.1 dBA L_{eq} at the nearest receiver locations. Project-related operational noise level increases will satisfy the operational noise level increase significance criteria presented in Table 4-1. Therefore, the increases at the sensitive receiver locations will be *less than significant.*

TABLE 10-5: DAYTIME PROJECT OPERATIONAL NOISE LEVEL INCREASES

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Noise Sensitive Land Use?	Increase Criteria[7]	Increase Criteria Exceeded?
R1	19.3	L1	70.7	70.7	0.0	Yes	1.5	No
R2	36.6	L2	58.9	58.9	0.0	Yes	5.0	No
R3	29.6	L3	51.1	51.1	0.0	Yes	5.0	No
R4	25.7	L4	55.2	55.2	0.0	Yes	5.0	No

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

TABLE 10-6: NIGHTTIME OPERATIONAL NOISE LEVEL INCREASES

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Noise Sensitive Land Use?	Increase Criteria[7]	Increase Criteria Exceeded?
R1	19.3	L1	66.7	66.7	0.0	Yes	1.5	No
R2	36.6	L2	54.5	54.6	0.1	Yes	5.0	No
R3	29.6	L3	44.3	44.4	0.1	Yes	5.0	No
R4	25.7	L4	49.4	49.4	0.0	Yes	5.0	No

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

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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 nearest sensitive receiver locations previously described in Section 9.

According the City of Highland General Plan Noise Element (Goal 7.3, Action 1), construction, as a condition of approval, shall be limited to daylight hours between 7:00 a.m. to 6:00 p.m. (15) In addition, since neither the City of Highland General Plan or Municipal Code establish numeric maximum acceptable construction source noise levels at potentially affected receivers for CEQA analysis purposes. Therefore, a numerical construction threshold based on Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual* is used for analysis of daytime construction impacts. The FTA considers a daytime exterior construction noise level of 80 dBA L_{eq} as a reasonable threshold for noise sensitive residential land use. (10)

11.1 CONSTRUCTION ACTIVITIES

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 are expected to occur in the following stages:

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

11.2 CONSTRUCTION REFERENCE NOISE LEVELS

To describe construction noise activities, this construction noise analysis was prepared using reference construction equipment noise levels from the Federal Highway Administration (FHWA) published the Roadway Construction Noise Model (RCNM), which includes a national database of construction equipment reference noise emission levels. (27) The RCNM equipment database provides a comprehensive list of the noise-generating characteristics of specific types of construction equipment. In addition, the database provides an acoustical usage factor to estimate the fraction of time each piece of construction equipment is operating at full power (i.e., its loudest condition) during a construction operation. According to the EPA, FTA, and FHWA, the overall construction noise level is governed primarily by the noisiest pieces of equipment. The quieter pieces do not affect the overall level, but they do reduce the magnitude of the fluctuations in the noise level. Therefore, a rough estimate of the noise level need only include the noisiest pieces of equipment expected at the site. (28) (10) (29) Consistent with FHWA and FTA guidance for detailed construction noise assessment, Table 11-1

presents the combined noise levels for the loudest construction activities expected for each stage, assuming all equipment operates simultaneously.

EXHIBIT 11-A: CONSTRUCTION NOISE SOURCE LOCATIONS

TABLE 11-1: CONSTRUCTION REFERENCE NOISE LEVELS

Construction Stage	Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})[1]	Combined Noise Level (dBA L_{eq})
Site Preparation	Crawler Tractors	77	79
	Hauling Trucks	71	
	Rubber Tired Dozers	71	
Grading	Graders	79	79
	Compactors	67	
	Excavators	64	
Building Construction	Tractors	72	74
	Cranes	67	
	Welders	65	
Paving	Pavers	70	74
	Paving Equipment	69	
	Rollers	69	
Architectural Coating	Cranes	67	72
	Air Compressors	67	
	Generator Sets	67	

[1] Update of Noise Database for Prediction of Noise on Construction and Open Sites by the Department for Environment, Food and Rural Affairs (DEFRA) expressed in hourly average L_{eq} based on estimated usage factors from the FHWA Roadway Construction Noise Model (RCNM).
[2] Represents the combined noise level for all equipment assuming they operate at the same time consistent with FTA Transit Noise and Vibration Impact Assessment guidance for general construction noise assessment.

11.3 CONSTRUCTION NOISE ANALYSIS

Construction projects involve various stages, and activities frequently shift from one location to another. For example, during site clearing and grading, noise-generating activities may concentrate in an area for a short period to remove an obstruction, while the majority of the grading involves the equipment moving back and forth in a predictable pattern throughout the site; building construction and foundation work generally concentrate near the building footprint, while paving generally involves a predictable pattern of movement throughout the site. Therefore, construction activities are best evaluated as multiple moving point sources within the construction area since the speed and power of the equipment vary, and the equipment constantly changes position in terms of its distance and direction relative to the receivers. (12) (30)

Using the reference construction equipment noise levels and the CadnaA noise prediction model, calculations of the Project construction noise level impacts by phase at the nearby sensitive receiver locations were completed. To account for the dynamic nature of construction activities, the CadnaA construction noise analysis evaluates the noise source activities as multiple moving point sources, or construction crews, within the limits of construction. Construction impacts are based on the loudest activity and the highest noise level calculated at each receiver location. As

shown in Table 11-2, the construction noise levels are expected to range from 38.4 to 61.6 dBA L_{eq}, and the highest construction levels are expected to range from 46.5 to 61.6 dBA L_{eq} at the nearby receiver locations. Appendix 11.1 includes the detailed CadnaA construction noise model inputs.

TABLE 11-2: 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	45.2	46.5	44.4	40.1	38.4	46.5
R2	60.3	61.6	59.5	55.2	53.5	61.6
R3	55.9	57.2	55.1	50.8	49.1	57.2
R4	52.0	53.3	51.2	46.9	45.2	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.

11.4 CONSTRUCTION NOISE LEVEL COMPLIANCE

To evaluate whether the Project will generate potentially significant short-term noise levels at the nearest receiver locations, the City of Highland has identified a construction-related daytime noise level threshold of 80 dBA L_{eq} to assess the daytime construction noise level impacts. The construction noise analysis shows that the nearest receiver locations will be below the daytime 80 dBA L_{eq} significance threshold during Project construction activities, as shown in Table 9-3. Therefore, the noise impacts due to Project construction noise are consistent with the WPBPEP DEIR and considered *less than significant*.

TABLE 11-3: CONSTRUCTION NOISE LEVEL COMPLIANCE

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})		
	Highest Construction Noise Levels[2]	Threshold[3]	Threshold Exceeded?[4]
R1	46.5	80	No
R2	61.6	80	No
R3	57.2	80	No
R4	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, as shown in Table 8-2.
[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?

11.5 TEMPORARY CONSTRUCTION NOISE LEVEL INCREASES

To describe the temporary Project construction noise level contributions to the existing ambient noise environment, the Project construction noise levels were combined with the existing ambient noise level measurements at the nearest off-site receiver locations. The difference between the combined Project-construction and ambient noise levels is used to describe the construction noise level contributions. Temporary noise level increases that would be experienced at sensitive receiver locations when Project construction-source noise is added to the ambient daytime conditions are presented in Table 11-4. A temporary noise level increase of 20 dBA is considered a *potentially significant* impact.

TABLE 11-4: DAYTIME CONSTRUCTION NOISE LEVEL INCREASES

Receiver Location[1]	Total Project Construction Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Increase[6]	Increase Criteria	Increase Criteria Exceeded?
R1	46.5	L1	70.7	70.7	0.0	20	No
R2	61.6	L2	58.9	63.5	4.6	20	No
R3	57.2	L3	51.1	58.2	7.1	20	No
R4	53.3	L4	55.2	57.4	2.2	20	No

[1] Construction noise source and receiver locations are shown in Exhibit 11-A.
[2] Total Project daytime construction noise levels as shown in Table 11-2.
[3] Reference noise level measurement locations as shown in Exhibit 5-A.
[4] Observed daytime ambient noise levels as shown in Table 5-1.
[5] Represents the combined ambient conditions plus the Project construction activities.
[6] The noise level increase expected with the addition of the proposed Project construction activities.

As indicated in Table 11-4, the Project will contribute construction noise level increases ranging from less than 0.1 to 7.1 dBA L_{eq} during the daytime hours at the nearest receiver locations. The unmitigated construction noise analysis shows that the nearest receiver locations will not exceed the Caltrans *substantial* 20 dBA L_{eq} noise level increase significance threshold during Project construction activities. The temporary construction noise level increase analysis shows that the noise impacts due to Project construction noise are considered *less than significant*.

11.6 CONSTRUCTION VIBRATION ANALYSIS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods employed. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Ground vibration levels associated with various types of construction equipment are summarized on Table 11-5. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the potential for building damage using the following vibration assessment methods defined by the FTA. To describe the vibration impacts the FTA provides the following equation: $PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$

TABLE 11-5: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

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

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual

Table 11-6 presents the expected Project-related vibration levels at the nearest receiver locations. At distances ranging from 118 to 2,036 feet from Project construction activities, construction vibration velocity levels are estimated to range from less than 0.01 to 0.01 PPV (in/sec). Based on the maximum acceptable continuous vibration threshold of 0.30 PPV (in/sec) for older residential buildings, the typical Project construction vibration levels will satisfy the building damage thresholds at all receiver locations. In addition, the typical construction vibration levels at the nearest sensitive receiver locations are unlikely to be sustained during the entire construction period but will occur rather only during the times that heavy construction equipment is operating adjacent to the Project site boundaries.

TABLE 11-6: CONSTRUCTION EQUIPMENT VIBRATION LEVELS

Receiver[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	Jackhammer	Loaded Trucks	Large bulldozer	Highest Vibration Level		
R1	2,036'	0.00	0.00	0.00	0.00	0.00	0.30	No
R2	118'	0.00	0.00	0.01	0.01	0.01	0.30	No
R3	334'	0.00	0.00	0.00	0.00	0.00	0.30	No
R4	652'	0.00	0.00	0.00	0.00	0.00	0.30	No

[1] 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] Caltrans Transportation and Construction Vibration Guidance Manual, April 2020, Tables 19, p. 38.
[5] Does the peak vibration exceed the acceptable vibration thresholds?
"PPV" = Peak Particle Velocity

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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 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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California Polytechnic State University, Pomona • June 2000

PROFESSIONAL AFFILIATIONS

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

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 HIGHLAND MUNICIPAL CODE

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Chapter 16.48
PERFORMANCE STANDARDS

Sections:

16.48.010 Purpose and intent.

The performance standards outlined in this section are intended to describe the location, configuration, design, amenities, operation, and other standards for existing and proposed development projects which have the capability of impacting the surrounding neighborhood.

The performance standards set maximum limits on adverse environmental effects created by any use or development of land. (Ord. 171 § 12.10, 1994)

16.48.020 Applicability.

A. Applicability. Unless otherwise specified, the performance standards contained within this section are intended to apply to land uses within the city, in addition to the standards of the district within which the use is located, and all other applicable portions of this title.

B. Administration and Management. The standards of this chapter shall be enforced in an ongoing manner by the community development director. Upon discovery of any potential violation of these standards, the community development director shall investigate, using such instruments as may be necessary. If a violation is found to exist, the violation shall be abated as prescribed in HMC 16.04.040.

C. Exemptions. The following sources of nuisances are exempt from the provisions of this chapter:

1. Emergency equipment, vehicles, devices, and activities.

2. Construction, maintenance, or demolition activities as identified in Chapter 15.48 HMC. (Ord. 435 § 17, 2019; Ord. 171 § 12.20, 1994)

16.48.030 Air quality.

No operation or activity shall cause the emission of any smoke, fly ash, dust, fumes, vapors, gases or other forms of air pollution which can cause material damage to health or property, or which can cause excessive dirt on any other lot. No emission shall be permitted which exceeds the requirements of the South Coast Air Quality Management District or the requirements of any Air Quality Plan adopted by the city of Highland. (Ord. 171 § 12.30, 1994)

16.48.040 Electrical or electronic interference.

No operation or activity shall cause any source of electrical or electronic disturbance that adversely affects persons or the operation of any equipment on any other lot and which is not in conformance with the regulations of the Federal Communication Commission. (Ord. 171 § 12.40, 1994)

16.48.050 Fire and explosive hazards.

Any operation or activity involving the storage of flammable or explosive materials shall be provided with adequate safety devices against the hazard of fire and explosion and adequate firefighting and fire suppression equipment and devices in accordance with the requirements of the fire code official and adopted fire code. Burning of waste materials in an open fire is prohibited. (Ord. 435 § 18, 2019; Ord. 171 § 12.50, 1994)

16.48.060 Hazardous materials and wastes.

The release or emission of hazardous materials and wastes into the atmosphere, ground, or sewerage systems is prohibited. (Ord. 171 § 12.60, 1994)

16.48.070 Heat and cold.

No operation or activity shall emit heat or cold which would cause a temperature increase or decrease on any adjacent property in excess of 10 degrees Fahrenheit, whether the change is in the air, on the ground, or in any structure. (Ord. 171 § 12.70, 1994)

16.48.080 Light and glare.

No operation, activity, sign, or lighting fixture shall create illumination which exceeds 0.5 foot candles minimum maintained on any adjacent property, whether the illumination is direct or indirect light from the source. All lighting shall be designed to project downward and shall not create glare on adjacent properties. (Ord. 171 § 12.80, 1994)

16.48.090 Liquid and solid wastes.

No operation or action shall discharge, at any point into any public street, public sewer, private sewage disposal system, stream, body of water or into the ground, any materials which can contaminate any water supply, interfere with bacterial processes in sewage treatment, or otherwise cause the emission of dangerous or offensive elements, except in accord with standards approved by the California Department of Health Services or other governmental agency with jurisdiction. (Ord. 171 § 12.90, 1994)

16.48.100 Maintenance of open areas.

All open areas shall be landscaped, or they shall be surfaced, treated and maintained permanently in a manner which will minimize dust. (Ord. 171 § 12.100, 1994)

16.48.110 Mechanical and electrical equipment.

All such equipment, including air conditioners, antennas, pumps, transformers, heating and ventilating equipment, shall be located and operated in a manner that does not materially disturb adjacent uses and activities. (Ord. 171 § 12.110, 1994)

16.48.120 Noise and sound.

Repealed by Ord. 283. (Ord. 171 § 12.120, 1994)

16.48.130 Odors.

No operation or activity shall be permitted which emits odorous gases or other odorous matter in such quantities as to be dangerous, injurious, noxious, or otherwise objectionable to a level that is detectable without the aid of instruments at or beyond the lot line. (Ord. 171 § 12.130, 1994)

16.48.140 Outdoor storage, trash areas, and service areas.

All storage areas for storage of maintenance equipment or vehicles, refuse and collection areas and service areas shall be enclosed or effectively screened from the public view with a fence, wall, landscaping, berming or a combination thereof. (Ord. 171 § 12.140, 1994)

16.48.150 Smoke.

No operation or activity is permitted to have operations which emit excessive smoke, fumes, or dust or which exceed the requirements or levels as specified by the South Coast Air Quality Management District. (Ord. 171 § 12.150, 1994)

16.48.160 Vibration.

No use shall be permitted which creates a steady-state, earth-borne oscillation which is continuous and occurring more frequently than 100 times per minute on adjacent properties. The ground vibration caused by moving vehicles, trains, aircraft, or temporary construction or demolition is exempted from these limits. (Ord. 171 § 12.160, 1994)

DIVISION 3: COUNTYWIDE DEVELOPMENT STANDARDS

CHAPTER 83.01: GENERAL PERFORMANCE STANDARDS

Section

§ 83.01.010 Purpose.

The purpose of this Chapter is to establish uniform performance standards for development within the County that promotes compatibility with surrounding areas and land uses.

Performance standards are designed to mitigate the environmental impacts of existing and proposed land uses within a community. Environmental impacts include air quality, glare, heat, noise, runoff control, and waste disposal. These general performance standards are intended to protect the health and safety of businesses, nearby residents, and workers and to prevent damaging effects to surrounding properties.

(Ord. 4011, passed - -2007)

§ 83.01.020 Applicability.

(a) *New and Existing Uses in All Land Use Zoning Districts.* The provisions of this Chapter apply to all new and existing uses in all land use zoning districts. The standards of this Chapter elaborate upon and otherwise augment the development standards specified for individual land use zoning districts in Division 2 (Land Use Zoning Districts and Allowed Land Uses) and in Division 4 (Standards for Specific Land Uses and Activities).

(b) *Compliance of Alterations or Modifications.* Uses of the land that existed on the effective date of this Division shall not be altered or modified so as to conflict with, or further conflict with, these standards.

(c) *Evidence of Compliance with Standards.* If requested by the Director or the Review Authority, applicants shall provide evidence to the Director that the proposed development is in compliance with the standards in this Division and other applicable standards in this Development Code before the issuance of a Building Permit or business license.

(Ord. 4011, passed - -2007)

§ 83.01.030 Modification of Standards.

(a) *Modification by Specific Reference.* The provisions of this Division shall prevail should they conflict with the provisions of a land use zoning district or specific plan, unless the land use zoning district or plan standard specifically overrides or modifies the provisions of this Division by specific reference.

(b) *Modification by Establishment of Overlay or Approval of Planned Development or Variance.* An overlay, approved Planned Development, or approved Variance may modify the provisions of this Division.

(Ord. 4011, passed - -2007)

§ 83.01.040 Air Quality.

(a) *Equipment Permit and Inspection Requirements.* Required permits shall be obtained from either the Mojave Air Pollution Management District or the South Coast Air Quality Management District depending on the location of the subject property and equipment for equipment that may cause air pollution. Before the equipment may be constructed, plans and specifications shall be submitted to the appropriate District for approval

(b) *Permits from Air Quality Management Districts.* Permits shall be obtained from either the Mojave Air Pollution

Management District or the South Coast Air Quality Management District depending on the location of the subject property and equipment. If requested by the Director, uses, activities, or processes that require Air Quality Management District approval to operate shall file a copy of the permit with the Department within 30 days of its approval.

(c) *Diesel Exhaust Emissions Control Measures.* The following emissions control measures shall apply to all discretionary land use projects approved by the County on or after January 15, 2009:

(1) *On-Road Diesel Vehicles.* On-road diesel vehicles are regulated by the State of California Air Resources Board.

(2) *Off-Road Diesel Vehicle/Equipment Operations.* All business establishments and contractors that use off-road diesel vehicle/equipment as part of their normal business operations shall adhere to the following measures during their operations in order to reduce diesel particulate matter emissions from diesel-fueled engines:

(A) Off-road vehicles/equipment shall not be left idling on site for periods in excess of five minutes. The idling limit does not apply to:

(I) Idling when queuing;

(II) Idling to verify that the vehicle is in safe operating condition;

(III) Idling for testing, servicing, repairing or diagnostic purposes;

(IV) Idling necessary to accomplish work for which the vehicle was designed (such as operating a crane);

(V) Idling required to bring the machine system to operating temperature; and

(VI) Idling necessary to ensure safe operation of the vehicle.

(B) Use reformulated ultra low-sulfur diesel fuel in equipment and use equipment certified by the U.S. Environmental Protection Agency (EPA) or that pre-dates EPA regulations.

(C) Maintain engines in good working order to reduce emissions.

(D) Signs shall be posted requiring vehicle drivers to turn off engines when parked.

(E) Any requirements or standards subsequently adopted by the South Coast Air Quality Management District, the Mojave Desert Air Quality Management District or the California Air Resources Board.

(F) Provide temporary traffic control during all phases of construction.

(G) On-site electrical power connections shall be provided for electric construction tools to eliminate the need for diesel-powered electric generators, where feasible.

(H) Maintain construction equipment engines in good working order to reduce emissions. The developer shall have each contractor certify that all construction equipment is properly serviced and maintained in good operating condition.

(I) Contractors shall use ultra low sulfur diesel fuel for stationary construction equipment as required by Air Quality Management District (AQMD) Rules 431.1 and 431.2 to reduce the release of undesirable emissions.

(J) Substitute electric and gasoline-powered equipment for diesel-powered equipment, where feasible.

(3) *Project Design.* Distribution centers, warehouses, truck stops and other facilities with loading docks where diesel trucks may reside overnight or for periods in excess of three hours shall be designed to enable any vehicle using these facilities to utilize on-site electrical connections to power the heating and air conditioning of the cabs of such trucks, and any refrigeration unit(s) of any trailer being pulled by the trucks, instead of operating the diesel engines and diesel refrigeration units of such trucks and trailers for these purposes. This requirement shall also apply to Recreational Vehicle Parks (as defined in § 810.01.200(k) of this title) and other development projects where diesel engines may reasonably be expected to operate on other than an occasional basis.

(Ord. 4011, passed - -2007; Am. Ord. 4065, passed - -2008)

§ 83.01.050 Electrical Disturbances.

No activity, land use, or process shall cause electrical disturbance that adversely affects persons or the operation of equipment across lot lines and that does not conform to the regulations of the Federal Communications Commission. Existing or proposed uses that generate electrical disturbances that are be considered hazardous or a public nuisance shall be contained, modified, or shielded to prevent disturbances.

(Ord. 4011, passed - -2007)

§ 83.01.060 Fire Hazards.

This Section establishes standards for storage of solid materials susceptible to fire hazards and flammable liquids and gases where allowed in compliance with Division 2 (Land Use Zoning Districts and Allowed Land Uses).

(a) *Combustible Solids.* Land uses that include the storage of solid materials susceptible to fire hazards shall be subject to the following storage standards in the indicated land use zoning districts.

(1) *Regional Industrial (IR) Land Use Zoning District.*

(A) *Inside Storage.* A structure utilized for the storage, manufacture, or use of flammable solid materials shall be located no less than 40 feet from any lot line and any other on-site structures or shall adhere to standards specified in Subdivision (2) below.

(B) *Outdoor Storage.* Outdoor storage of flammable solid materials shall be no less than 50 feet from any lot line and any other on-site structures.

(2) *All Other Manufacturing or Industrial Uses Legally Established Within Any Other Land Use Zoning District.*The storage, manufacture, or use of highly flammable solid materials shall take place in enclosed spaces having fire resistance of no less than two hours and protected with an automatic fire extinguishing system.

(b) *Flammable Liquids and Gases.* Land uses that involve the storage of flammable liquids and gases shall be subject to the following standards when established within the land use zoning districts indicated.

(1) *Setbacks.* County Code Title 2, Division 3 (Fire Protection and Explosives and Hazardous Materials) shall establish setback requirements for flammable liquids and gases.

(2) *Storage capacity.* The total storage capacity of flammable liquids and gases on a parcel shall not exceed the quantities indicated in Table 83-1 (Storage Standards for Flammable Liquids and Gases).

Table 83-1		
Storage Standards for Flammable Liquids and Gases		
Stored Substance	***Land Use Zoning District***	***Maximum Capacity***
Table 83-1		
Storage Standards for Flammable Liquids and Gases		
Stored Substance	***Land Use Zoning District***	***Maximum Capacity***
SCF = Standard cubic feet at 60ºF and 29.92" Hg (i.e., mercury)		
Liquids	Regional Industrial District (IR)	120,000 gallons
	All other manufacturing or industrial uses legally established within any other land use zoning district	60,000 gallons
Liquefied Petroleum Gas (LPG)	All manufacturing or industrial uses established in any land zoning use district	Per County Code Title 2, Division 3 (Fire Protection and Explosives and Hazardous Materials)
	All commercial uses legally established in any land use zoning district	15,000 gal./tank
		20,000 gallons maximum aggregate total
	All agricultural uses legally established in any land use zoning district and aggregate total	15,000 gal./tank and aggregate total
Gases other than liquefied petroleum gas	Regional Industrial District (IR)	300,000 SCF above ground
		600,000 SCF below ground
	All other manufacturing or industrial uses legally established within any other land use zoning district	150,000 SCF above ground
		300,000 SCF below ground

(c) *Liquefied Petroleum Gas (LPG).*

(1) *General Requirements.*

(A) *Agricultural, Commercial, Industrial, or Manufacturing Uses and Land Use Zoning Districts.*Liquefied petroleum gas (LPG) storage and distribution facilities for agricultural, commercial, industrial, or manufacturing uses shall be allowed subject to a Use Permit in compliance with Division 2 (Land Use Zoning Districts and Allowed Land Uses). The location, installation, operation, and maintenance of LPG storage and distribution facilities shall be subject to:

(I) The standards in this Subdivision.

(II) The conditions, requirements, and standards imposed by the Review Authority in compliance with this Chapter.

(B) *Residential Uses and Land Use Zoning Districts.* County Code Title 2, Division 3 (Fire Protection and Explosives and Hazardous Materials) shall establish standards for residential uses and residential land use zoning districts for LPG

storage.

(C) *Conflict Between Land Use District and Use Permit Requirements.* In the event of a conflict between the provisions of this § 83.01.060(c) (Liquefied Petroleum Gas [LPG]) and the provisions of a land use zoning district, including the requirement for Use Permit, the provisions of this Section shall prevail and control.

(2) *Fire Protection Requirements for All Parcels.*

(A) Setbacks for LPG storage and distribution facilities from structures and property lines shall be those specified by County Code Title 2, Division 3 (Fire Protection and Explosives and Hazardous Materials).

(B) LPG storage tanks shall be centrally located on the parcel to the satisfaction of the Fire Department.

(3) *Additional Fire Protection Requirements for Specific Types of Parcels.* For parcels that have no more than one occupied structure less than 5,000 square feet in size and where the water system provides substandard flows per International Standards Organization (ISO) standards for structure protection, additional fire protection requirements shall be as follows:

(A) *Where Parcel Size Is Ten Acres or More.* Fire flow shall be calculated for exposures only in compliance with County Code Title 2, Division 3 (Fire Protection and Explosives and Hazardous Materials).

(B) *Where Parcel Size Is at Least Five Acres but less than Ten Acres.*

(I) A one hour approved protective coating shall be applied to the LPG storage tank.

(II) Fire flow shall be calculated for exposures only, in compliance with County CodeTitle 2, Division 3 (Fire Protection and Explosives and Hazardous Materials).

(C) *Where Parcel Size Is at Least Two and One-half Acres, but less than Five Acres.*

(I) A two hour approved protective coating shall be applied to the tank.

(II) Fire flow shall be calculated for exposures only, in compliance with County CodeTitle 2, Division 3 (Fire Protection and Explosives and Hazardous Materials).

(4) *Additional Fire Protection Requirements for Any Parcel with Adequate Fire Flow Available per ISO Standards.*

(A) Fire hydrant(s) shall serve the parcel in compliance with County CodeTitle 2, Division 3 (Fire Protection and Explosives and Hazardous Materials).

(B) Fire flow shall provide for exposure protection (ISO Calculation) and LPG storage tank protection/suppression.

(I) Sprinklers shall use calculations, as adopted by County Code Title 2, Division 3 (Fire Protection and Explosives and Hazardous Materials).

(II) Hose lines shall use the formula: GPM = five times the square root of the tank capacity.

(C) Additional protection.

(I) Where the Fire Chief determines that water can be applied to the tank or exposures by the Fire Department in required amounts in eight minutes or less, no additional protection shall be required.

(II) Where the Fire Chief determines that water cannot be applied to the tank or exposures by the Fire Department in required amounts in eight minutes or less, one of the following protection measures shall be required:

(i) One hour approved protective coating shall be applied to the LPG storage tank; or

(ii) A fixed spray water system shall be installed as approved by the Fire Department.

(5) Additional fire protection requirements for any parcel not included in either Subdivisions (C)(III) or (C)(IV), above:

(A) Either a one-hour or more protective coating shall be applied to the LPG storage tank, as required by the Fire Department, or a fixed spray water system shall be installed instead of coating the tank.

(B) Fire flow shall be calculated for exposure only, in compliance with the San Bernardino CodeTitle 2, Division 3 (Fire Protection and Explosives and Hazardous Materials).

(Ord. 4011, passed - -2007)

§ 83.01.070 Heat.

Land uses in industrial districts shall not emit heat that would cause a temperature increase on any adjacent property in excess of ten degrees Fahrenheit, whether the change is in the air, on the ground, or in a structure.

(Ord. 4011, passed - -2007)

§ 83.01.080 Noise.

This Section establishes standards concerning acceptable noise levels for both noise-sensitive land uses and for noise-

generating land uses.

(a) *Noise Measurement.* Noise shall be measured:

(1) At the property line of the nearest site that is occupied by, and/or zoned or designated to allow the development of noise-sensitive land uses;

(2) With a sound level meter that meets the standards of the American National Standards Institute (ANSI § SI4 1979, Type 1 or Type 2);

(3) Using the "A" weighted sound pressure level scale in decibels (ref. pressure = 20 micronewtons per meter squared). The unit of measure shall be designated as dB(A).

(b) *Noise Impacted Areas.* Areas within the County shall be designated as "noise-impacted" if exposed to existing or projected future exterior noise levels from mobile or stationary sources exceeding the standards listed in Subdivision (d) (Noise Standards for Stationary Noise Sources) and Subdivision (e) (Noise Standards for Adjacent Mobile Noise Sources), below. New development of residential or other noise-sensitive land uses shall not be allowed in noise-impacted areas unless effective mitigation measures are incorporated into the project design to reduce noise levels to these standards. Noise-sensitive land uses shall include residential uses, schools, hospitals, nursing homes, religious institutions, libraries, and similar uses.

(c) *Noise Standards for Stationary Noise Sources.*

(1) *Noise Standards.* Table 83-2 (Noise Standards for Stationary Noise Sources) describes the noise standard for emanations from a stationary noise source, as it affects adjacent properties:

Table 83-2		
Noise Standards for Stationary Noise Sources		
Affected Land Uses (Receiving Noise)	***7:00 a.m. - 10:00 p.m. Leq***	***10:00 p.m. - 7:00 a.m. Leq***
Table 83-2		
Noise Standards for Stationary Noise Sources		
Affected Land Uses (Receiving Noise)	***7:00 a.m. - 10:00 p.m. Leq***	***10:00 p.m. - 7:00 a.m. Leq***
Residential	55 dB(A)	45 dB(A)
Professional Services	55 dB(A)	55 dB(A)
Other Commercial	60 dB(A)	60 dB(A)
Industrial	70 dB(A)	70 dB(A)
Leq = (Equivalent Energy Level). The sound level corresponding to a steady-state sound level containing the same total energy as a time-varying signal over a given sample period, typically one, eight or 24 hours.		
dB(A) = (A-weighted Sound Pressure Level). The sound pressure level, in decibels, as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound, placing greater emphasis on those frequencies within the sensitivity range of the human ear.		
Ldn = (Day-Night Noise Level). The average equivalent A-weighted sound level during a 24-hour day obtained by adding 10 decibels to the hourly noise levels measured during the night (from 10:00 p.m. to 7:00 a.m.). In this way Ldn takes into account the lower tolerance of people for noise during nighttime periods.		

(2) *Noise Limit Categories.* No person shall operate or cause to be operated a source of sound at a location or allow the creation of noise on property owned, leased, occupied, or otherwise controlled by the person, which causes the noise level, when measured on another property, either incorporated or unincorporated, to exceed any one of the following:

(A) The noise standard for the receiving land use as specified in Subdivision (b) (Noise-Impacted Areas), above, for a cumulative period of more than 30 minutes in any hour.

(B) The noise standard plus five dB(A) for a cumulative period of more than 15 minutes in any hour.

(C) The noise standard plus ten dB(A) for a cumulative period of more than five minutes in any hour.

(D) The noise standard plus 15 dB(A) for a cumulative period of more than one minute in any hour.

(E) The noise standard plus 20 dB(A) for any period of time.

(d) *Noise Standards for Adjacent Mobile Noise Sources.* Noise from mobile sources may affect adjacent properties adversely. When it does, the noise shall be mitigated for any new development to a level that shall not exceed the standards described in the following Table 83-3 (Noise Standards for Adjacent Mobile Noise Sources).

Table 83-3			
Noise Standards for Adjacent Mobile Noise Sources			
Land Use		***Ldn (or CNEL) dB(A)***	
Categories	***Uses***	***Interior*** (1)	***Exterior*** (2)

Table 83-3			
Noise Standards for Adjacent Mobile Noise Sources			
Land Use		***Ldn (or CNEL) dB(A)***	
Categories	***Uses***	***Interior*** (1)	***Exterior*** (2)

Residential	Single and multi-family, duplex, mobile homes	45	60(3)
Commercial	Hotel, motel, transient housing	45	60(3)
	Commercial retail, bank, restaurant	50	N/A
	Office building, research and development, professional offices	45	65
	Amphitheater, concert hall, auditorium, movie theater	45	N/A
Institutional/Public	Hospital, nursing home, school classroom, religious institution, library	45	65
Open Space	Park	N/A	65

Notes:

(1) The indoor environment shall exclude bathrooms, kitchens, toilets, closets and corridors.

(2) The outdoor environment shall be limited to:

- Hospital/office building patios
- Hotel and motel recreation areas
- Mobile home parks
- Multi-family private patios or balconies
- Park picnic areas
- Private yard of single-family dwellings
- School playgrounds

(3) An exterior noise level of up to 65 dB(A) (or CNEL) shall be allowed provided exterior noise levels have been substantially mitigated through a reasonable application of the best available noise reduction technology, and interior noise exposure does not exceed 45 dB(A) (or CNEL) with windows and doors closed. Requiring that windows and doors remain closed to achieve an acceptable interior noise level shall necessitate the use of air conditioning or mechanical ventilation.

CNEL = (Community Noise Equivalent Level). The average equivalent A-weighted sound level during a 24-hour day, obtained after addition of approximately five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and ten decibels to sound levels in the night from 10:00 p.m. to 7:00 a.m.

(e) *Increases in Allowable Noise Levels.* If the measured ambient level exceeds any of the first four noise limit categories in Subdivision (d)(2), above, the allowable noise exposure standard shall be increased to reflect the ambient noise level. If the ambient noise level exceeds the fifth noise limit category in Subdivision (d)(2), above, the maximum allowable noise level under this category shall be increased to reflect the maximum ambient noise level.

(f) *Reductions in Allowable Noise Levels.* If the alleged offense consists entirely of impact noise or simple tone noise, each of the noise levels in Table 83-2 (Noise Standards for Stationary Noise Sources) shall be reduced by five dB(A).

(g) *Exempt Noise.* The following sources of noise shall be exempt from the regulations of this Section:

(1) Motor vehicles not under the control of the commercial or industrial use.

(2) Emergency equipment, vehicles, and devices.

(3) Temporary construction, maintenance, repair, or demolition activities between 7:00 a.m. and 7:00 p.m., except Sundays and Federal holidays.

(h) *Noise Standards for Other Structures.* All other structures shall be sound attenuated against the combined input of all present and projected exterior noise to not exceed the criteria.

Table 83-4	
Noise Standards for Other Structures	
Typical Uses	***12-Hour Equivalent Sound Level (Interior) in dBA Ldn***
Educational, institutions, libraries, meeting facilities, etc.	45
General office, reception, etc.	50
Retail stores, restaurants, etc.	55
Other areas for manufacturing, assembly, testing, warehousing, etc.	65

In addition, the average of the maximum levels on the loudest of intrusive sounds occurring during a 24-hour period shall not exceed 65 dBA interior.

(Ord. 4011, passed - -2007; Am. Ord. 4245, passed - -2014)

§ 83.01.090 Vibration.

(a) *Vibration Standard.* No ground vibration shall be allowed that can be felt without the aid of instruments at or beyond the lot line, nor shall any vibration be allowed which produces a particle velocity greater than or equal to two-tenths inches per second measured at or beyond the lot line.

(b) *Vibration Measurement.* Vibration velocity shall be measured with a seismograph or other instrument capable of measuring and recording displacement and frequency, particle velocity, or acceleration. Readings shall be made at points of maximum vibration along any lot line next to a parcel within a residential, commercial and industrial land use zoning district.

(c) *Exempt Vibrations.* The following sources of vibration shall be exempt from the regulations of this Section.

(1) Motor vehicles not under the control of the subject use.

(2) Temporary construction, maintenance, repair, or demolition activities between 7:00 a.m. and 7:00 p.m., except Sundays and Federal holidays.

(Ord. 4011, passed - -2007)

§ 83.01.100 Waste Disposal.

(a) *Liquid Waste Disposal and Runoff Control.* No liquids of any kind shall be discharged into a public or private sewage or drainage system, watercourse, body of water, or into the ground, except in compliance with applicable regulations of the County Code, Title 23 (Waters) of the California Code of Regulations, the California Water Code, and related Federal regulations.

(b) *Hazardous Waste.* Refer to Chapter 84.11 (Hazardous Waste Facilities) for regulations relative to hazardous waste facilities.

(c) *Solid Waste Disposal.* Refer to Chapter 84.24 (Solid Waste/Recyclable Materials Storage) for regulations relative to solid waste disposal.

(Ord. 4011, passed - -2007)

§ 83.01.110 External Commercial or Industrial Activity on Private Property.

There shall be no unpermitted external or industrial activity on properties subject to the County's jurisdiction between the hours of 9:00 p.m. and 7:00 a.m. that shall at any time impair the quiet enjoyment of neighboring property owners or residents or in any manner disturb the public peace.

(Ord. 4245, passed - -2014)

APPENDIX 5.1:

STUDY AREA PHOTOS

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15974 - East Highland

15974_L1_B_East
34, 6' 35.770000",117, 8' 36.000000"

15974_L1_B_North
34, 6' 35.760000",117, 8' 36.030000"

15974_L1_B_South
34, 6' 35.740000",117, 8' 35.970000"

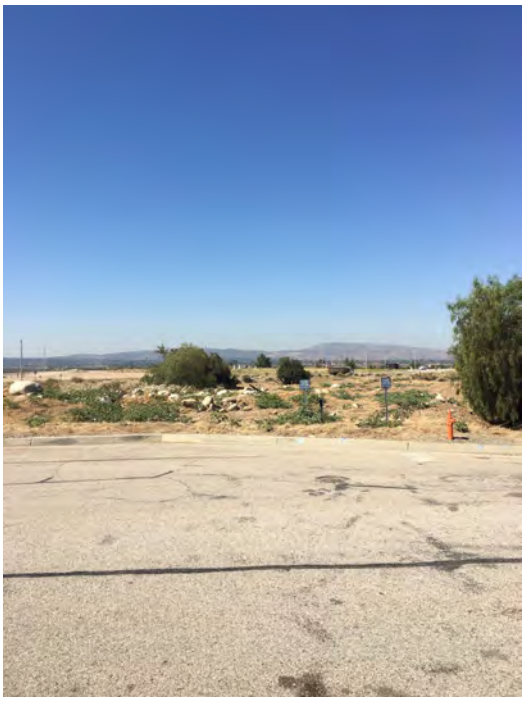
15974_L1_B_West
34, 6' 35.740000",117, 8' 35.970000"

15974 - East Highland

15974_L2_C_East
34, 6' 43.420000",117, 8' 59.480000"

15974_L2_C_North
34, 6' 43.380000",117, 8' 59.350000"

15974_L2_C_South
34, 6' 43.400000",117, 8' 59.480000"



15974_L2_C_West
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15974 - East Highland

15974_L3_D_East
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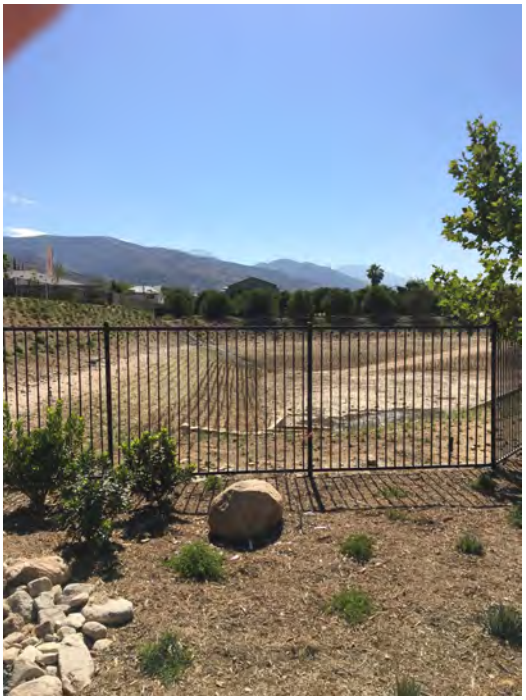

15974_L3_D_North
34, 6' 46.520000",117, 9' 5.500000"

15974_L3_D_South
34, 6' 46.440000",117, 9' 5.580000"

15974_L3_D_West
34, 6' 46.400000",117, 9' 5.610000"

15974 - East Highland

15974_L4_Z_East
34, 6' 46.410000",117, 9' 17.310000"

15974_L4_Z_North
34, 6' 47.170000",117, 9' 5.500000"

15974_L4_Z_South
34, 6' 46.400000",117, 9' 17.310000"

15974_L4_Z_West
34, 6' 46.400000",117, 9' 17.310000"

APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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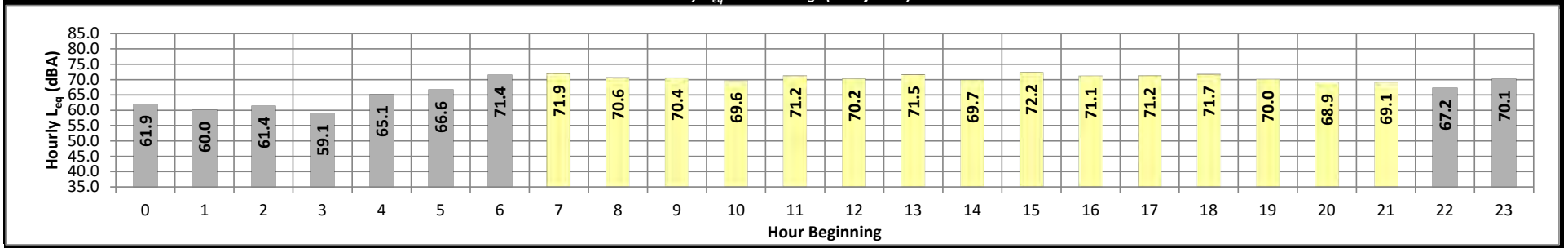
24-Hour Noise Level Measurement Summary

Date: Wednesday, June 26, 2024 *Location:* L1 - Located west of the site near the residence at 7914 Calle *Meter:* Piccolo II *JN:* 15974

Project: East Highland Technical Studies *Source:* Del Rio St. *Analyst:* N. Johnson

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	61.9	73.8	47.1	73.5	73.0	69.9	67.2	58.1	52.3	49.6	48.5	47.5	61.9	10.0	71.9
	1	60.0	72.2	38.7	71.8	71.3	68.3	65.1	54.8	51.4	39.7	39.3	38.9	60.0	10.0	70.0
	2	61.4	73.0	57.4	72.5	71.5	67.0	63.6	59.0	58.0	57.5	57.5	57.5	61.4	10.0	71.4
	3	59.1	72.4	37.2	72.0	71.2	67.2	63.4	52.4	44.0	38.6	37.7	37.3	59.1	10.0	69.1
	4	65.1	78.2	44.1	77.7	76.7	73.1	69.9	60.5	52.4	45.5	44.9	44.2	65.1	10.0	75.1
	5	66.6	77.8	47.3	77.3	76.6	74.2	72.5	65.0	57.1	49.0	48.2	47.5	66.6	10.0	76.6
	6	71.4	80.7	53.9	80.3	79.5	77.9	76.8	72.4	66.6	56.7	55.5	54.2	71.4	10.0	81.4
Day	7	71.9	80.9	54.1	80.5	79.8	78.0	77.0	72.8	67.8	57.2	55.7	54.3	71.9	0.0	71.9
	8	70.6	79.6	54.5	79.2	78.6	77.0	76.0	71.5	66.0	56.9	55.6	54.7	70.6	0.0	70.6
	9	70.4	80.1	52.1	79.8	79.1	76.9	75.7	71.1	65.0	54.7	53.3	52.2	70.4	0.0	70.4
	10	69.6	78.9	51.0	78.6	77.9	76.1	74.9	70.4	64.7	53.7	52.5	51.2	69.6	0.0	69.6
	11	71.2	81.5	52.3	81.1	80.2	77.4	76.1	71.6	66.5	55.9	53.9	52.5	71.2	0.0	71.2
	12	70.2	79.1	50.7	78.7	78.1	76.4	75.5	71.3	65.7	54.2	52.5	51.2	70.2	0.0	70.2
	13	71.5	82.4	50.4	82.0	80.9	78.0	76.1	71.7	66.3	54.6	52.6	50.6	71.5	0.0	71.5
	14	69.7	78.7	50.2	78.3	77.6	75.9	74.9	71.0	65.4	54.0	51.9	50.5	69.7	0.0	69.7
	15	72.2	82.4	52.2	82.1	81.6	79.4	77.1	72.3	67.2	56.1	54.1	52.4	72.2	0.0	72.2
	16	71.1	79.8	52.8	79.5	78.8	77.0	75.8	72.4	67.6	55.9	54.4	53.1	71.1	0.0	71.1
	17	71.2	79.2	53.6	78.9	78.3	76.9	76.0	72.8	67.8	57.0	55.4	53.8	71.2	0.0	71.2
	18	71.7	81.4	53.4	80.9	80.1	77.8	76.5	72.6	67.2	56.5	54.9	53.6	71.7	0.0	71.7
	19	70.0	79.3	51.7	78.9	78.3	76.5	75.2	70.8	64.5	54.8	53.2	51.9	70.0	5.0	75.0
	20	68.9	78.0	51.6	77.7	77.0	75.4	74.4	69.8	63.7	54.1	52.8	51.7	68.9	5.0	73.9
	21	69.1	78.4	59.0	78.1	77.4	75.4	74.1	69.1	64.6	61.8	60.8	59.4	69.1	5.0	74.1
Night	22	67.2	76.9	56.4	76.6	76.0	73.7	72.0	66.5	63.0	60.6	59.3	57.1	67.2	10.0	77.2
	23	70.1	83.7	45.9	83.2	82.2	78.7	74.5	61.9	53.1	46.8	46.3	46.0	70.1	10.0	80.1

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	68.9	78.0	50.2	77.7	77.0	75.4	74.1	69.1	63.7	53.7	51.9	50.5
	Max	72.2	82.4	59.0	82.1	81.6	79.4	77.1	72.8	67.8	61.8	60.8	59.4
Energy Average		70.7	Average:		79.6	78.9	76.9	75.7	71.4	66.0	55.8	54.2	52.9
Night	Min	59.1	72.2	37.2	71.8	71.2	67.0	63.4	52.4	44.0	38.6	37.7	37.3
	Max	71.4	83.7	57.4	83.2	82.2	78.7	76.8	72.4	66.6	60.6	59.3	57.5
Energy Average		66.7	Average:		76.1	75.3	72.2	69.4	61.2	55.3	49.3	48.6	47.8

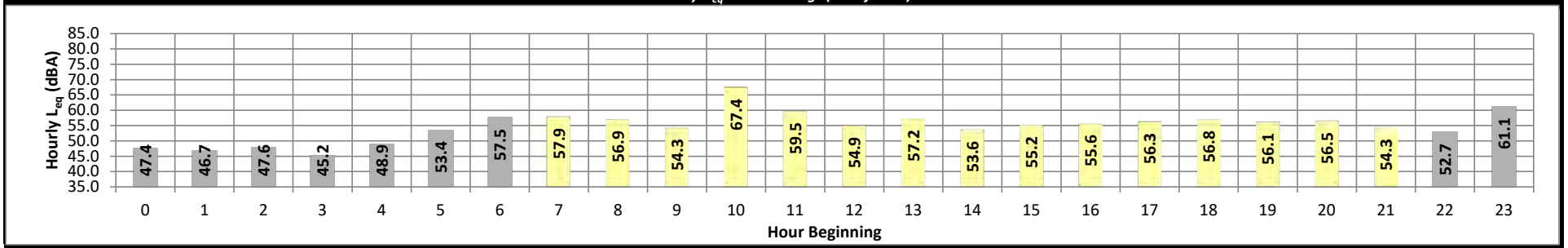
24-Hour CNEL	Leq (dBA) Daytime (7am-10pm)	Leq (dBA) Nighttime (10pm-7am)
74.3	**70.7**	**66.7**

24-Hour Noise Level Measurement Summary

Date: Wednesday, June 26, 2024 *Location:* L2 - Located north of the site near the residence at 7796 Alta *Meter:* Piccolo II *JN:* 15974

Project: East Highland Technical Studies *Source:* Vista *Analyst:* N. Johnson

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	47.4	53.1	45.3	52.7	52.4	50.8	49.1	47.2	46.6	46.0	45.8	45.5	47.4	10.0	57.4
	1	46.7	57.3	42.5	56.9	56.2	52.4	49.3	44.6	44.0	43.1	42.9	42.7	46.7	10.0	56.7
	2	47.6	59.9	40.2	59.4	58.5	55.1	51.7	43.8	41.8	40.8	40.6	40.3	47.6	10.0	57.6
	3	45.2	56.3	38.6	56.0	55.3	52.6	49.7	42.0	40.2	39.2	39.0	38.7	45.2	10.0	55.2
	4	48.9	60.3	39.5	59.9	59.0	56.1	53.8	46.8	42.7	40.3	39.9	39.6	48.9	10.0	58.9
	5	53.4	62.8	44.6	62.4	61.6	59.2	57.1	53.3	51.2	47.4	46.5	45.2	53.4	10.0	63.4
	6	57.5	69.3	45.5	68.9	68.1	65.5	63.1	54.2	49.4	46.3	45.9	45.6	57.5	10.0	67.5
Day	7	57.9	70.9	43.4	70.4	69.2	65.4	62.7	53.6	48.0	44.3	44.0	43.6	57.9	0.0	57.9
	8	56.9	68.8	43.1	68.4	67.7	65.0	62.2	54.0	48.0	43.9	43.5	43.2	56.9	0.0	56.9
	9	54.3	64.6	44.0	64.3	63.7	61.3	59.2	53.3	49.1	45.0	44.6	44.1	54.3	0.0	54.3
	10	67.4	80.7	45.1	80.0	78.9	74.9	73.8	60.2	51.4	46.4	45.9	45.3	67.4	0.0	67.4
	11	59.5	70.5	43.5	70.1	69.9	68.8	66.1	55.4	49.4	44.9	44.3	43.7	59.5	0.0	59.5
	12	54.9	65.9	43.1	65.5	65.0	62.7	60.4	53.0	48.0	44.3	43.8	43.3	54.9	0.0	54.9
	13	57.2	69.3	42.0	69.0	68.2	65.5	62.7	52.4	47.7	43.1	42.5	42.1	57.2	0.0	57.2
	14	53.6	64.4	42.9	64.1	63.5	60.9	58.6	52.0	48.2	44.2	43.7	43.1	53.6	0.0	53.6
	15	55.2	66.0	43.7	65.8	65.3	62.6	60.1	53.4	49.4	44.9	44.4	43.8	55.2	0.0	55.2
	16	55.6	65.4	46.4	65.1	64.5	62.3	60.4	55.1	51.5	47.7	47.1	46.5	55.6	0.0	55.6
	17	56.3	67.1	48.1	66.7	65.9	62.7	60.3	55.0	52.3	49.4	48.9	48.2	56.3	0.0	56.3
	18	56.8	68.2	47.2	67.7	66.7	64.1	61.2	55.1	52.2	48.7	48.0	47.4	56.8	0.0	56.8
	19	56.1	67.1	46.1	66.7	66.0	63.0	60.7	54.8	51.6	47.6	47.0	46.3	56.1	5.0	61.1
	20	56.5	65.4	49.3	65.0	64.4	62.0	60.0	56.3	54.4	51.3	50.6	49.8	56.5	5.0	61.5
	21	54.3	62.6	50.6	62.3	61.8	59.2	57.1	54.0	52.5	51.3	51.1	50.9	54.3	5.0	59.3
Night	22	52.7	61.5	48.2	61.2	60.4	58.2	56.4	52.1	50.3	48.9	48.7	48.4	52.7	10.0	62.7
	23	61.1	64.2	60.0	64.1	63.8	62.9	62.3	61.2	60.8	60.3	60.2	60.1	61.1	10.0	71.1

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	53.6	62.6	42.0	62.3	61.8	59.2	57.1	52.0	47.7	43.1	42.5	42.1
	Max	67.4	80.7	50.6	80.0	78.9	74.9	73.8	60.2	54.4	51.3	51.1	50.9
Energy Average		58.9	Average:		67.4	66.7	64.0	61.7	54.5	50.2	46.5	46.0	45.4
Night	Min	45.2	53.1	38.6	52.7	52.4	50.8	49.1	42.0	40.2	39.2	39.0	38.7
	Max	61.1	69.3	60.0	68.9	68.1	65.5	63.1	61.2	60.8	60.3	60.2	60.1
Energy Average		54.5	Average:		60.2	59.5	57.0	54.7	49.5	47.4	45.8	45.5	45.1

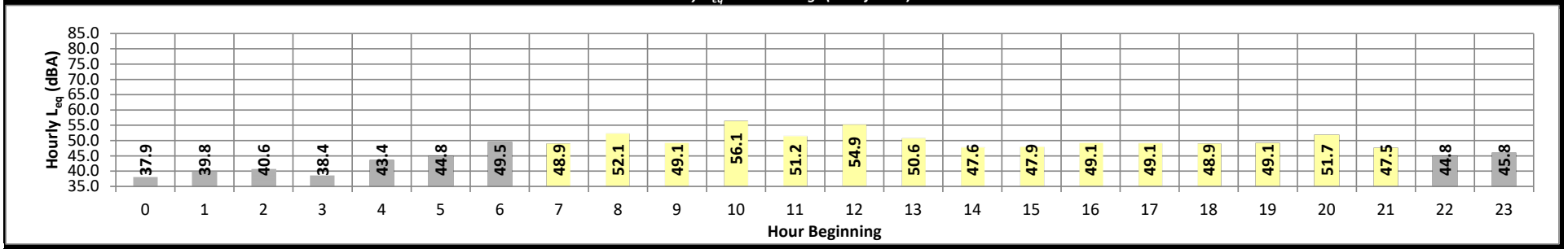
24-Hour CNEL	Leq (dBA) Daytime (7am-10pm)	Leq (dBA) Nighttime (10pm-7am)
62.2	**58.9**	**54.5**

24-Hour Noise Level Measurement Summary

Date: Wednesday, June 26, 2024 *Location:* L3 - Located northwest of the site near the residence at 29894 *Meter:* Piccolo II *JN:* 15974

Project: East Highland Technical Studies *Source:* Santa Ana Canyon Rd. *Analyst:* N. Johnson

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	*Hour*	*L_{eq}*	*L_{max}*	*L_{min}*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*	*L_{eq}*	*Adj.*	*Adj. L_{eq}*
Night	0	37.9	41.0	36.0	40.8	40.6	40.2	39.7	38.5	37.5	36.5	36.3	36.1	37.9	10.0	47.9
	1	39.8	49.4	35.0	49.1	48.6	45.9	43.3	39.3	36.5	35.4	35.2	35.1	39.8	10.0	49.8
	2	40.6	51.3	33.8	51.0	50.6	48.1	45.1	38.5	35.1	34.1	34.0	33.8	40.6	10.0	50.6
	3	38.4	47.6	34.1	47.4	46.8	44.6	42.6	37.3	35.6	34.5	34.4	34.2	38.4	10.0	48.4
	4	43.4	51.8	36.4	51.4	51.0	49.4	48.0	43.9	40.4	37.3	37.0	36.6	43.4	10.0	53.4
	5	44.8	52.8	39.0	52.6	52.2	50.9	49.5	44.3	42.5	39.9	39.6	39.2	44.8	10.0	54.8
	6	49.5	58.4	42.5	58.2	57.8	55.8	54.1	49.2	46.0	43.4	43.1	42.7	49.5	10.0	59.5
Day	7	48.9	59.4	40.5	59.1	58.4	55.9	53.5	48.0	43.9	41.3	41.0	40.6	48.9	0.0	48.9
	8	52.1	63.7	41.4	63.2	62.6	60.7	57.7	48.0	44.6	42.1	41.8	41.5	52.1	0.0	52.1
	9	49.1	58.5	40.5	58.3	57.7	55.8	54.2	48.4	45.5	41.8	41.3	40.7	49.1	0.0	49.1
	10	56.1	65.7	40.3	65.3	64.9	63.3	61.6	56.9	49.2	42.1	41.2	40.6	56.1	0.0	56.1
	11	51.2	61.3	39.5	60.9	60.4	58.9	57.1	50.2	45.3	41.0	40.4	39.7	51.2	0.0	51.2
	12	54.9	69.1	37.7	68.8	67.5	62.7	58.0	46.2	42.4	39.0	38.4	37.9	54.9	0.0	54.9
	13	50.6	61.4	41.4	60.7	59.6	57.2	55.2	49.8	46.0	42.9	42.2	41.5	50.6	0.0	50.6
	14	47.6	58.3	38.4	57.7	56.9	54.7	52.9	46.5	43.1	39.6	39.1	38.6	47.6	0.0	47.6
	15	47.9	57.9	38.6	57.5	56.8	55.1	53.5	46.8	42.9	39.8	39.2	38.7	47.9	0.0	47.9
	16	49.1	58.9	40.0	58.5	58.0	55.9	54.2	48.8	44.5	41.2	40.7	40.1	49.1	0.0	49.1
	17	49.1	57.8	41.9	57.5	57.0	54.9	53.3	48.9	46.2	43.2	42.7	42.1	49.1	0.0	49.1
	18	48.9	57.4	41.7	57.1	56.6	54.8	53.2	49.0	46.3	43.1	42.5	41.8	48.9	0.0	48.9
	19	49.1	57.9	41.3	57.6	57.1	55.2	53.6	48.8	46.1	42.9	42.2	41.5	49.1	5.0	54.1
	20	51.7	61.6	42.6	61.2	60.9	59.8	58.4	48.0	45.8	43.4	43.1	42.7	51.7	5.0	56.7
	21	47.5	55.3	42.6	54.8	54.5	53.3	52.0	47.1	45.0	43.3	43.0	42.7	47.5	5.0	52.5
Night	22	44.8	52.8	39.9	52.6	52.2	50.3	48.4	44.6	42.7	40.6	40.3	40.0	44.8	10.0	54.8
	23	45.8	55.1	39.1	54.8	54.3	52.2	50.6	44.6	42.1	39.8	39.5	39.2	45.8	10.0	55.8

Timeframe	*Hour*	*L_{eq}*	*L_{max}*	*L_{min}*	*L1%*	*L2%*	*L5%*	*L8%*	*L25%*	*L50%*	*L90%*	*L95%*	*L99%*
Day	Min	47.5	55.3	37.7	54.8	54.5	53.3	52.0	46.2	42.4	39.0	38.4	37.9
	Max	56.1	69.1	42.6	68.8	67.5	63.3	61.6	56.9	49.2	43.4	43.1	42.7
Energy Average		51.1	Average:		59.9	59.3	57.2	55.2	48.8	45.1	41.8	41.3	40.7
Night	Min	37.9	41.0	33.8	40.8	40.6	40.2	39.7	37.3	35.1	34.1	34.0	33.8
	Max	49.5	58.4	42.5	58.2	57.8	55.8	54.1	49.2	46.0	43.4	43.1	42.7
Energy Average		44.3	Average:		50.9	50.5	48.6	46.8	42.2	39.8	37.9	37.7	37.4

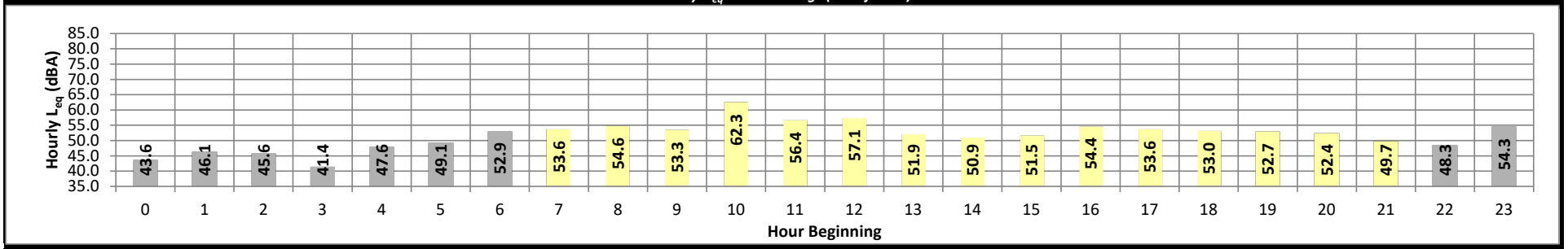
24-Hour CNEL	*Leq (dBA) Daytime (7am-10pm)*	*Leq (dBA) Nighttime (10pm-7am)*
53.2	**51.1**	**44.3**

24-Hour Noise Level Measurement Summary

Date: Wednesday, June 26, 2024 *Location:* L4 - Located northeast of the site near the residence at 7735 *Meter:* Piccolo II *JN:* 15974

Project: East Highland Technical Studies *Source:* Henslee Dr. *Analyst:* N. Johnson

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	43.6	51.9	40.2	51.6	51.0	48.4	46.4	43.4	41.8	40.6	40.4	40.3	43.6	10.0	53.6
	1	46.1	57.7	43.2	56.7	54.6	49.8	47.2	44.7	44.1	43.5	43.4	43.2	46.1	10.0	56.1
	2	45.6	58.1	36.6	57.9	57.1	53.5	49.9	40.0	37.9	36.9	36.8	36.7	45.6	10.0	55.6
	3	41.4	52.3	35.8	52.2	51.4	48.4	45.3	39.0	37.2	36.1	36.0	35.8	41.4	10.0	51.4
	4	47.6	59.0	38.0	58.5	57.7	54.5	51.6	46.2	43.4	38.9	38.4	38.1	47.6	10.0	57.6
	5	49.1	59.6	40.3	59.4	58.7	55.9	53.3	48.0	44.9	41.4	41.0	40.5	49.1	10.0	59.1
	6	52.9	63.7	45.4	63.3	62.6	59.8	57.5	51.0	48.6	46.3	46.0	45.5	52.9	10.0	62.9
Day	7	53.6	65.7	43.0	65.2	64.3	61.0	58.1	50.6	46.8	43.9	43.6	43.1	53.6	0.0	53.6
	8	54.6	68.0	41.4	67.5	66.5	62.4	58.7	47.9	44.3	42.2	41.9	41.5	54.6	0.0	54.6
	9	53.3	64.4	42.9	64.1	63.4	60.6	57.8	51.7	48.3	44.1	43.6	43.1	53.3	0.0	53.3
	10	62.3	76.1	42.5	75.6	74.7	70.4	66.6	54.1	48.7	44.0	43.3	42.7	62.3	0.0	62.3
	11	56.4	68.3	41.1	67.8	67.0	64.2	61.8	53.9	46.6	42.2	41.8	41.2	56.4	0.0	56.4
	12	57.1	71.1	39.5	70.4	69.5	64.9	60.3	49.4	44.2	40.7	40.2	39.7	57.1	0.0	57.1
	13	51.9	65.1	38.4	64.6	63.6	59.7	56.1	46.0	42.5	39.5	39.1	38.6	51.9	0.0	51.9
	14	50.9	62.6	39.1	62.4	61.8	58.8	55.8	47.4	43.7	40.3	39.9	39.3	50.9	0.0	50.9
	15	51.5	63.2	39.4	62.8	62.0	59.0	56.9	48.8	43.9	40.6	40.1	39.6	51.5	0.0	51.5
	16	54.4	66.7	40.9	66.3	65.5	62.0	59.4	51.1	46.4	42.3	41.8	41.1	54.4	0.0	54.4
	17	53.6	64.7	42.8	64.4	63.7	60.7	58.3	51.8	48.2	44.4	43.7	43.0	53.6	0.0	53.6
	18	53.0	63.5	42.6	63.2	62.5	59.9	58.1	51.9	47.8	44.2	43.6	42.8	53.0	0.0	53.0
	19	52.7	63.7	41.2	63.2	62.4	59.8	58.0	50.9	47.1	42.8	42.1	41.4	52.7	5.0	57.7
	20	52.4	64.3	42.1	63.8	62.9	59.4	56.9	50.2	46.3	43.3	42.8	42.2	52.4	5.0	57.4
	21	49.7	61.0	41.6	60.6	59.9	56.8	54.1	47.2	44.9	42.5	42.1	41.7	49.7	5.0	54.7
Night	22	48.3	59.7	39.5	59.4	58.8	55.7	52.7	45.7	42.6	40.3	39.9	39.6	48.3	10.0	58.3
	23	54.3	66.9	38.9	66.4	65.7	62.5	59.4	49.6	41.7	39.6	39.3	39.0	54.3	10.0	64.3

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	49.7	61.0	38.4	60.6	59.9	56.8	54.1	46.0	42.5	39.5	39.1	38.6
	Max	62.3	76.1	43.0	75.6	74.7	70.4	66.6	54.1	48.7	44.4	43.7	43.1
Energy Average		55.2	Average:		65.5	64.6	61.3	58.5	50.2	46.0	42.5	42.0	41.4
Night	Min	41.4	51.9	35.8	51.6	51.0	48.4	45.3	39.0	37.2	36.1	36.0	35.8
	Max	54.3	66.9	45.4	66.4	65.7	62.5	59.4	51.0	48.6	46.3	46.0	45.5
Energy Average		49.4	Average:		58.4	57.5	54.3	51.5	45.3	42.5	40.4	40.1	39.9

24-Hour CNEL	Leq (dBA) Daytime (7am-10pm)	Leq (dBA) Nighttime (10pm-7am)
57.6	**55.2**	**49.4**

APPENDIX 8.1:

ONSITE NOISE CALCULATIONS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard No Wall
Road Name: Greenspot Rd.
Lot No: Lot 8

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,000 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	52 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	60.0 feet
Centerline Dist. to Observer:	70.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,448.7 feet
Road Elevation:	1,451.0 feet
Barrier Elevation:	1,451.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,451.00		
Medium Trucks:	1,453.30		
Heavy Trucks:	1,459.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	35.599
Medium Trucks:	35.499
Heavy Trucks:	35.891

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	72.73	0.19	2.11	-1.20	*-0.27*	0.000	0.000
Medium Trucks:	79.85	-17.05	2.13	-1.20	*-0.42*	0.000	0.000
Heavy Trucks:	83.81	-21.01	2.06	-1.20	*-0.95*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	73.8	71.9	70.2	64.1	72.7	73.3
Medium Trucks:	63.7	62.2	55.9	54.3	62.8	63.0
Heavy Trucks:	63.7	62.2	53.2	54.5	62.8	62.9
Vehicle Noise:	74.6	72.8	70.4	64.9	73.5	74.1

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	73.8	71.9	70.2	64.1	72.7	73.3
Medium Trucks:	63.7	62.2	55.9	54.3	62.8	63.0
Heavy Trucks:	63.7	62.2	53.2	54.5	62.8	62.9
Vehicle Noise:	74.6	72.8	70.4	64.9	73.5	74.1

Tuesday, March 18, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard No Wall
Road Name: Greenspot Rd.
Lot No: Lot 106

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,000 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	52 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	88.0 feet
Centerline Dist. to Observer:	98.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,463.0 feet
Road Elevation:	1,464.0 feet
Barrier Elevation:	1,464.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,464.00		
Medium Trucks:	1,466.30		
Heavy Trucks:	1,472.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	67.261
Medium Trucks:	67.163
Heavy Trucks:	67.261

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	72.73	0.19	-2.04	-1.20	*-0.65*	0.000	0.000
Medium Trucks:	79.85	-17.05	-2.03	-1.20	*-0.78*	0.000	0.000
Heavy Trucks:	83.81	-21.01	-2.04	-1.20	*-1.15*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.7	67.8	66.0	60.0	68.6	69.2
Medium Trucks:	59.6	58.1	51.7	50.2	58.6	58.9
Heavy Trucks:	59.6	58.2	49.1	50.4	58.7	58.8
Vehicle Noise:	70.5	68.6	66.3	60.8	69.4	69.9

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.7	67.8	66.0	60.0	68.6	69.2
Medium Trucks:	59.6	58.1	51.7	50.2	58.6	58.9
Heavy Trucks:	59.6	58.2	49.1	50.4	58.7	58.8
Vehicle Noise:	70.5	68.6	66.3	60.8	69.4	69.9

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard No Wall
Road Name: Alta Vista
Lot No: Lot 62

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	100 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	41.0 feet
Centerline Dist. to Observer:	51.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,457.0 feet
Road Elevation:	1,459.0 feet
Barrier Elevation:	1,459.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,459.00		
Medium Trucks:	1,461.30		
Heavy Trucks:	1,467.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	43.543
Medium Trucks:	43.445
Heavy Trucks:	43.727

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-9.40	0.80	-1.20	*-0.33*	0.000	0.000
Medium Trucks:	71.09	-26.64	0.81	-1.20	*-0.50*	0.000	0.000
Heavy Trucks:	77.24	-30.59	0.77	-1.20	*-1.06*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	49.6	47.7	46.0	39.9	48.5	49.1
Medium Trucks:	44.1	42.6	36.2	34.6	43.1	43.3
Heavy Trucks:	46.2	44.8	35.8	37.0	45.4	45.5
Vehicle Noise:	52.0	50.3	46.8	42.5	51.0	51.4

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	49.6	47.7	46.0	39.9	48.5	49.1
Medium Trucks:	44.1	42.6	36.2	34.6	43.1	43.3
Heavy Trucks:	46.2	44.8	35.8	37.0	45.4	45.5
Vehicle Noise:	52.0	50.3	46.8	42.5	51.0	51.4

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard No Wall
Road Name: Alta Vista
Lot No: Lot 67

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	100 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	80.0 feet
Centerline Dist. to Observer:	90.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,459.1 feet
Road Elevation:	1,464.0 feet
Barrier Elevation:	1,464.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,464.00		
Medium Trucks:	1,466.30		
Heavy Trucks:	1,472.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	82.704
Medium Trucks:	82.733
Heavy Trucks:	83.081

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-9.40	-3.38	-1.20	*0.00*	0.000	0.000
Medium Trucks:	71.09	-26.64	-3.38	-1.20	*-0.01*	0.000	0.000
Heavy Trucks:	77.24	-30.59	-3.41	-1.20	*-0.06*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	45.5	43.6	41.8	35.7	44.4	45.0
Medium Trucks:	39.9	38.4	32.0	30.5	38.9	39.1
Heavy Trucks:	42.0	40.6	31.6	32.8	41.2	41.3
Vehicle Noise:	47.8	46.1	42.6	38.3	46.8	47.3

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	45.5	43.6	41.8	35.7	44.4	45.0
Medium Trucks:	39.9	38.4	32.0	30.5	38.9	39.1
Heavy Trucks:	42.0	40.6	31.6	32.8	41.2	41.3
Vehicle Noise:	47.8	46.1	42.6	38.3	46.8	47.3

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard No Wall
Road Name: Santa Ana Canyon Rd.
Lot No: Lot 74

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	100 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	46.0 feet
Centerline Dist. to Observer:	56.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,460.6 feet
Road Elevation:	1,465.0 feet
Barrier Elevation:	1,465.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,465.00		
Medium Trucks:	1,467.30		
Heavy Trucks:	1,473.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	48.501
Medium Trucks:	48.527
Heavy Trucks:	49.060

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-9.40	0.09	-1.20	*-0.01*	0.000	0.000
Medium Trucks:	71.09	-26.64	0.09	-1.20	*-0.05*	0.000	0.000
Heavy Trucks:	77.24	-30.59	0.02	-1.20	*-0.27*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	48.9	47.0	45.3	39.2	47.8	48.4
Medium Trucks:	43.3	41.8	35.5	33.9	42.4	42.6
Heavy Trucks:	45.5	44.0	35.0	36.3	44.6	44.7
Vehicle Noise:	51.3	49.6	46.1	41.8	50.3	50.7

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	48.9	47.0	45.3	39.2	47.8	48.4
Medium Trucks:	43.3	41.8	35.5	33.9	42.4	42.6
Heavy Trucks:	45.5	44.0	35.0	36.3	44.6	44.7
Vehicle Noise:	51.3	49.6	46.1	41.8	50.3	50.7

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard No Wall
Road Name: Santa Ana Canyon Rd.
Lot No: Lot 81

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	100 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,460.0 feet
Road Elevation:	1,463.0 feet
Barrier Elevation:	1,463.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,463.00		
Medium Trucks:	1,465.30		
Heavy Trucks:	1,471.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	42.474
Medium Trucks:	42.427
Heavy Trucks:	42.849

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-9.40	0.96	-1.20	*-0.15*	0.000	0.000
Medium Trucks:	71.09	-26.64	0.97	-1.20	*-0.27*	0.000	0.000
Heavy Trucks:	77.24	-30.59	0.90	-1.20	*-0.72*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	49.8	47.9	46.1	40.1	48.7	49.3
Medium Trucks:	44.2	42.7	36.3	34.8	43.3	43.5
Heavy Trucks:	46.3	44.9	35.9	37.1	45.5	45.6
Vehicle Noise:	52.2	50.5	46.9	42.6	51.2	51.6

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	49.8	47.9	46.1	40.1	48.7	49.3
Medium Trucks:	44.2	42.7	36.3	34.8	43.3	43.5
Heavy Trucks:	46.3	44.9	35.9	37.1	45.5	45.6
Vehicle Noise:	52.2	50.5	46.9	42.6	51.2	51.6

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard With Wall
Road Name: Greenspot Rd.
Lot No: Lot 8

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,000 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	52 feet

Site Data

Barrier Height:	**6.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	60.0 feet
Centerline Dist. to Observer:	70.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,448.7 feet
Road Elevation:	1,451.0 feet
Barrier Elevation:	1,451.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,451.00		
Medium Trucks:	1,453.30		
Heavy Trucks:	1,459.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	33.246
Medium Trucks:	32.750
Heavy Trucks:	32.531

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	72.73	0.19	2.56	-1.20	*0.95*	-10.150	-13.150
Medium Trucks:	79.85	-17.05	2.65	-1.20	*0.71*	-9.340	-12.340
Heavy Trucks:	83.81	-21.01	2.70	-1.20	*0.26*	-7.220	-10.220

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	74.3	72.4	70.6	64.5	73.2	73.8
Medium Trucks:	64.3	62.7	56.4	54.8	63.3	63.5
Heavy Trucks:	64.3	62.9	53.8	55.1	63.5	63.6
Vehicle Noise:	75.1	73.2	70.9	65.4	74.0	74.5

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.1	62.2	60.5	54.4	63.0	63.6
Medium Trucks:	54.9	53.4	47.0	45.5	54.0	54.2
Heavy Trucks:	57.1	55.7	46.6	47.9	56.2	56.4
Vehicle Noise:	65.3	63.5	60.8	55.7	64.3	64.8

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard With Wall
Road Name: Greenspot Rd.
Lot No: Lot 106

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,000 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	52 feet

Site Data

Barrier Height:	**6.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	88.0 feet
Centerline Dist. to Observer:	98.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,463.0 feet
Road Elevation:	1,464.0 feet
Barrier Elevation:	1,464.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,464.00		
Medium Trucks:	1,466.30		
Heavy Trucks:	1,472.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	66.802
Medium Trucks:	66.605
Heavy Trucks:	66.519

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	72.73	0.19	-1.99	-1.20	*0.37*	-7.850	-10.850
Medium Trucks:	79.85	-17.05	-1.97	-1.20	*0.28*	-7.360	-10.360
Heavy Trucks:	83.81	-21.01	-1.96	-1.20	*0.12*	-6.160	-9.160

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	69.7	67.8	66.1	60.0	68.6	69.2
Medium Trucks:	59.6	58.1	51.8	50.2	58.7	58.9
Heavy Trucks:	59.6	58.2	49.2	50.4	58.8	58.9
Vehicle Noise:	70.5	68.7	66.3	60.9	69.4	70.0

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	61.9	60.0	58.2	52.2	60.8	61.4
Medium Trucks:	52.3	50.8	44.4	42.9	51.3	51.6
Heavy Trucks:	53.5	52.1	43.0	44.3	52.6	52.8
Vehicle Noise:	62.9	61.1	58.5	53.2	61.8	62.3

Tuesday, March 18, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard With Wall
Road Name: Alta Vista
Lot No: Lot 62

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	100 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	41.0 feet
Centerline Dist. to Observer:	51.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,457.0 feet
Road Elevation:	1,459.0 feet
Barrier Elevation:	1,459.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,459.00		
Medium Trucks:	1,461.30		
Heavy Trucks:	1,467.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	43.543
Medium Trucks:	43.445
Heavy Trucks:	43.727

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-9.40	0.80	-1.20	*-0.33*	0.000	0.000
Medium Trucks:	71.09	-26.64	0.81	-1.20	*-0.50*	0.000	0.000
Heavy Trucks:	77.24	-30.59	0.77	-1.20	*-1.06*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	49.6	47.7	46.0	39.9	48.5	49.1
Medium Trucks:	44.1	42.6	36.2	34.6	43.1	43.3
Heavy Trucks:	46.2	44.8	35.8	37.0	45.4	45.5
Vehicle Noise:	52.0	50.3	46.8	42.5	51.0	51.4

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	49.6	47.7	46.0	39.9	48.5	49.1
Medium Trucks:	44.1	42.6	36.2	34.6	43.1	43.3
Heavy Trucks:	46.2	44.8	35.8	37.0	45.4	45.5
Vehicle Noise:	52.0	50.3	46.8	42.5	51.0	51.4

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard With Wall
Road Name: Alta Vista
Lot No: Lot 67

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	100 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	80.0 feet
Centerline Dist. to Observer:	90.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,459.1 feet
Road Elevation:	1,464.0 feet
Barrier Elevation:	1,464.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,464.00		
Medium Trucks:	1,466.30		
Heavy Trucks:	1,472.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	82.704
Medium Trucks:	82.733
Heavy Trucks:	83.081

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-9.40	-3.38	-1.20	*0.00*	0.000	0.000
Medium Trucks:	71.09	-26.64	-3.38	-1.20	*-0.01*	0.000	0.000
Heavy Trucks:	77.24	-30.59	-3.41	-1.20	*-0.06*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	45.5	43.6	41.8	35.7	44.4	45.0
Medium Trucks:	39.9	38.4	32.0	30.5	38.9	39.1
Heavy Trucks:	42.0	40.6	31.6	32.8	41.2	41.3
Vehicle Noise:	47.8	46.1	42.6	38.3	46.8	47.3

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	45.5	43.6	41.8	35.7	44.4	45.0
Medium Trucks:	39.9	38.4	32.0	30.5	38.9	39.1
Heavy Trucks:	42.0	40.6	31.6	32.8	41.2	41.3
Vehicle Noise:	47.8	46.1	42.6	38.3	46.8	47.3

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard With Wall
Road Name: Santa Ana Canyon Rd.
Lot No: Lot 74

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	100 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	46.0 feet
Centerline Dist. to Observer:	56.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,460.6 feet
Road Elevation:	1,465.0 feet
Barrier Elevation:	1,465.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,465.00		
Medium Trucks:	1,467.30		
Heavy Trucks:	1,473.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	48.501
Medium Trucks:	48.527
Heavy Trucks:	49.060

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-9.40	0.09	-1.20	*-0.01*	0.000	0.000
Medium Trucks:	71.09	-26.64	0.09	-1.20	*-0.05*	0.000	0.000
Heavy Trucks:	77.24	-30.59	0.02	-1.20	*-0.27*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	48.9	47.0	45.3	39.2	47.8	48.4
Medium Trucks:	43.3	41.8	35.5	33.9	42.4	42.6
Heavy Trucks:	45.5	44.0	35.0	36.3	44.6	44.7
Vehicle Noise:	51.3	49.6	46.1	41.8	50.3	50.7

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	48.9	47.0	45.3	39.2	47.8	48.4
Medium Trucks:	43.3	41.8	35.5	33.9	42.4	42.6
Heavy Trucks:	45.5	44.0	35.0	36.3	44.6	44.7
Vehicle Noise:	51.3	49.6	46.1	41.8	50.3	50.7

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Backyard With Wall
Road Name: Santa Ana Canyon Rd.
Lot No: Lot 81

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	100 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	50.0 feet
Barrier Distance to Observer:	10.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,460.0 feet
Road Elevation:	1,463.0 feet
Barrier Elevation:	1,463.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,463.00		
Medium Trucks:	1,465.30		
Heavy Trucks:	1,471.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	42.474
Medium Trucks:	42.427
Heavy Trucks:	42.849

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-9.40	0.96	-1.20	*-0.15*	0.000	0.000
Medium Trucks:	71.09	-26.64	0.97	-1.20	*-0.27*	0.000	0.000
Heavy Trucks:	77.24	-30.59	0.90	-1.20	*-0.72*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	49.8	47.9	46.1	40.1	48.7	49.3
Medium Trucks:	44.2	42.7	36.3	34.8	43.3	43.5
Heavy Trucks:	46.3	44.9	35.9	37.1	45.5	45.6
Vehicle Noise:	52.2	50.5	46.9	42.6	51.2	51.6

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	49.8	47.9	46.1	40.1	48.7	49.3
Medium Trucks:	44.2	42.7	36.3	34.8	43.3	43.5
Heavy Trucks:	46.3	44.9	35.9	37.1	45.5	45.6
Vehicle Noise:	52.2	50.5	46.9	42.6	51.2	51.6

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: First Floor With Wall
Road Name: Greenspot Rd.
Lot No: Lot 8

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,000 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	52 feet

Site Data

Barrier Height:	**6.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	60.0 feet
Centerline Dist. to Observer:	80.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,448.7 feet
Road Elevation:	1,451.0 feet
Barrier Elevation:	1,451.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,451.00		
Medium Trucks:	1,453.30		
Heavy Trucks:	1,459.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	42.986
Medium Trucks:	42.490
Heavy Trucks:	42.271

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	72.73	0.19	0.88	-1.20	*0.71*	-9.340	-12.340
Medium Trucks:	79.85	-17.05	0.96	-1.20	*0.46*	-8.300	-11.300
Heavy Trucks:	83.81	-21.01	0.99	-1.20	*0.07*	-5.700	-8.700

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	72.6	70.7	68.9	62.9	71.5	72.1
Medium Trucks:	62.6	61.1	54.7	53.1	61.6	61.8
Heavy Trucks:	62.6	61.2	52.1	53.4	61.7	61.9
Vehicle Noise:	73.4	71.6	69.2	63.7	72.3	72.9

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	63.3	61.4	59.6	53.5	62.2	62.8
Medium Trucks:	54.3	52.8	46.4	44.8	53.3	53.5
Heavy Trucks:	56.9	55.5	46.4	47.7	56.0	56.2
Vehicle Noise:	64.6	62.8	60.0	55.0	63.5	64.0

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: First Floor With Wall
Road Name: Greenspot Rd.
Lot No: Lot 106

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,000 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	52 feet

Site Data

Barrier Height:	**6.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	88.0 feet
Centerline Dist. to Observer:	108.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,463.0 feet
Road Elevation:	1,464.0 feet
Barrier Elevation:	1,464.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,464.00		
Medium Trucks:	1,466.30		
Heavy Trucks:	1,472.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	76.704
Medium Trucks:	76.506
Heavy Trucks:	76.420

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	72.73	0.19	-2.89	-1.20	*0.29*	-7.430	-10.430
Medium Trucks:	79.85	-17.05	-2.87	-1.20	*0.19*	-6.720	-9.720
Heavy Trucks:	83.81	-21.01	-2.87	-1.20	*0.03*	-5.300	-8.300

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.8	66.9	65.2	59.1	67.7	68.3
Medium Trucks:	58.7	57.2	50.9	49.3	57.8	58.0
Heavy Trucks:	58.7	57.3	48.3	49.5	57.9	58.0
Vehicle Noise:	69.6	67.8	65.4	60.0	68.5	69.1

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	61.4	59.5	57.7	51.7	60.3	60.9
Medium Trucks:	52.0	50.5	44.1	42.6	51.1	51.3
Heavy Trucks:	53.4	52.0	43.0	44.2	52.6	52.7
Vehicle Noise:	62.4	60.6	58.1	52.8	61.4	61.9

Tuesday, March 18, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: First Floor With Wall
Road Name: Alta Vista
Lot No: Lot 62

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	100 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	41.0 feet
Centerline Dist. to Observer:	61.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,457.0 feet
Road Elevation:	1,459.0 feet
Barrier Elevation:	1,459.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,459.00		
Medium Trucks:	1,461.30		
Heavy Trucks:	1,467.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	53.628
Medium Trucks:	53.549
Heavy Trucks:	53.778

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-9.40	-0.56	-1.20	*-0.14*	0.000	0.000
Medium Trucks:	71.09	-26.64	-0.55	-1.20	*-0.29*	0.000	0.000
Heavy Trucks:	77.24	-30.59	-0.58	-1.20	*-0.90*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	48.3	46.4	44.6	38.6	47.2	47.8
Medium Trucks:	42.7	41.2	34.8	33.3	41.7	42.0
Heavy Trucks:	44.9	43.4	34.4	35.7	44.0	44.1
Vehicle Noise:	50.7	49.0	45.4	41.1	49.7	50.1

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	48.3	46.4	44.6	38.6	47.2	47.8
Medium Trucks:	42.7	41.2	34.8	33.3	41.7	42.0
Heavy Trucks:	44.9	43.4	34.4	35.7	44.0	44.1
Vehicle Noise:	50.7	49.0	45.4	41.1	49.7	50.1

Tuesday, March 18, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: First Floor With Wall
Road Name: Alta Vista
Lot No: Lot 67

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	100 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	80.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,459.1 feet
Road Elevation:	1,464.0 feet
Barrier Elevation:	1,464.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,464.00		
Medium Trucks:	1,466.30		
Heavy Trucks:	1,472.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	92.736
Medium Trucks:	92.762
Heavy Trucks:	93.073

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-9.40	-4.13	-1.20	*0.00*	0.000	0.000
Medium Trucks:	71.09	-26.64	-4.13	-1.20	*-0.01*	0.000	0.000
Heavy Trucks:	77.24	-30.59	-4.15	-1.20	*-0.10*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	44.7	42.8	41.0	35.0	43.6	44.2
Medium Trucks:	39.1	37.6	31.3	29.7	38.2	38.4
Heavy Trucks:	41.3	39.9	30.8	32.1	40.4	40.6
Vehicle Noise:	47.1	45.4	41.8	37.6	46.1	46.5

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	44.7	42.8	41.0	35.0	43.6	44.2
Medium Trucks:	39.1	37.6	31.3	29.7	38.2	38.4
Heavy Trucks:	41.3	39.9	30.8	32.1	40.4	40.6
Vehicle Noise:	47.1	45.4	41.8	37.6	46.1	46.5

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: First Floor With Wall
Road Name: Santa Ana Canyon Rd.
Lot No: Lot 74

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	100 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	46.0 feet
Centerline Dist. to Observer:	66.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,460.6 feet
Road Elevation:	1,465.0 feet
Barrier Elevation:	1,465.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,465.00		
Medium Trucks:	1,467.30		
Heavy Trucks:	1,473.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	58.586
Medium Trucks:	58.608
Heavy Trucks:	59.050

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-9.40	-1.14	-1.20	*-0.01*	0.000	0.000
Medium Trucks:	71.09	-26.64	-1.14	-1.20	*-0.05*	0.000	0.000
Heavy Trucks:	77.24	-30.59	-1.19	-1.20	*-0.35*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	47.7	45.8	44.0	38.0	46.6	47.2
Medium Trucks:	42.1	40.6	34.2	32.7	41.2	41.4
Heavy Trucks:	44.3	42.8	33.8	35.1	43.4	43.5
Vehicle Noise:	50.1	48.4	44.8	40.6	49.1	49.5

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	47.7	45.8	44.0	38.0	46.6	47.2
Medium Trucks:	42.1	40.6	34.2	32.7	41.2	41.4
Heavy Trucks:	44.3	42.8	33.8	35.1	43.4	43.5
Vehicle Noise:	50.1	48.4	44.8	40.6	49.1	49.5

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: First Floor With Wall
Road Name: Santa Ana Canyon Rd.
Lot No: Lot 81

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	100 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	5.0 feet
Pad Elevation:	1,460.0 feet
Road Elevation:	1,463.0 feet
Barrier Elevation:	1,463.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,463.00		
Medium Trucks:	1,465.30		
Heavy Trucks:	1,471.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	52.574
Medium Trucks:	52.537
Heavy Trucks:	52.878

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-9.40	-0.43	-1.20	*-0.06*	0.000	0.000
Medium Trucks:	71.09	-26.64	-0.43	-1.20	*-0.17*	0.000	0.000
Heavy Trucks:	77.24	-30.59	-0.47	-1.20	*-0.70*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	48.4	46.5	44.7	38.7	47.3	47.9
Medium Trucks:	42.8	41.3	35.0	33.4	41.9	42.1
Heavy Trucks:	45.0	43.6	34.5	35.8	44.1	44.3
Vehicle Noise:	50.8	49.1	45.5	41.3	49.8	50.2

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	48.4	46.5	44.7	38.7	47.3	47.9
Medium Trucks:	42.8	41.3	35.0	33.4	41.9	42.1
Heavy Trucks:	45.0	43.6	34.5	35.8	44.1	44.3
Vehicle Noise:	50.8	49.1	45.5	41.3	49.8	50.2

Tuesday, March 18, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Fourth Floor With Wall
Road Name: Greenspot Rd.
Lot No: Lot 8

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,000 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	52 feet

Site Data

Barrier Height:	**6.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	60.0 feet
Centerline Dist. to Observer:	80.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	32.0 feet
Pad Elevation:	1,448.7 feet
Road Elevation:	1,451.0 feet
Barrier Elevation:	1,451.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,451.00		
Medium Trucks:	1,453.30		
Heavy Trucks:	1,459.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	55.876
Medium Trucks:	54.689
Heavy Trucks:	52.064

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	72.73	0.19	-0.83	-1.20	*-3.82*	0.000	0.000
Medium Trucks:	79.85	-17.05	-0.69	-1.20	*-4.56*	0.000	0.000
Heavy Trucks:	83.81	-21.01	-0.37	-1.20	*-6.73*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.9	69.0	67.2	61.2	69.8	70.4
Medium Trucks:	60.9	59.4	53.0	51.5	60.0	60.2
Heavy Trucks:	61.2	59.8	50.8	52.0	60.4	60.5
Vehicle Noise:	71.7	69.9	67.5	62.1	70.6	71.2

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	70.9	69.0	67.2	61.2	69.8	70.4
Medium Trucks:	60.9	59.4	53.0	51.5	60.0	60.2
Heavy Trucks:	61.2	59.8	50.8	52.0	60.4	60.5
Vehicle Noise:	71.7	69.9	67.5	62.1	70.6	71.2

Tuesday, March 18, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Fourth Floor With Wall
Road Name: Greenspot Rd.
Lot No: Lot 106

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,000 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	52 feet

Site Data

Barrier Height:	**6.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	88.0 feet
Centerline Dist. to Observer:	108.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	32.0 feet
Pad Elevation:	1,463.0 feet
Road Elevation:	1,464.0 feet
Barrier Elevation:	1,464.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,464.00		
Medium Trucks:	1,466.30		
Heavy Trucks:	1,472.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	83.720
Medium Trucks:	82.897
Heavy Trucks:	81.097

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	72.73	0.19	-3.46	-1.20	*-6.50*	0.000	0.000
Medium Trucks:	79.85	-17.05	-3.40	-1.20	*-7.09*	0.000	0.000
Heavy Trucks:	83.81	-21.01	-3.25	-1.20	*-8.69*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.3	66.4	64.6	58.5	67.2	67.8
Medium Trucks:	58.2	56.7	50.3	48.8	57.3	57.5
Heavy Trucks:	58.4	56.9	47.9	49.1	57.5	57.6
Vehicle Noise:	69.0	67.2	64.8	59.4	68.0	68.5

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.3	66.4	64.6	58.5	67.2	67.8
Medium Trucks:	58.2	56.7	50.3	48.8	57.3	57.5
Heavy Trucks:	58.4	56.9	47.9	49.1	57.5	57.6
Vehicle Noise:	69.0	67.2	64.8	59.4	68.0	68.5

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Fourth Floor With Wall
Road Name: Alta Vista
Lot No: Lot 62

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	100 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	41.0 feet
Centerline Dist. to Observer:	61.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	32.0 feet
Pad Elevation:	1,457.0 feet
Road Elevation:	1,459.0 feet
Barrier Elevation:	1,459.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,459.00		
Medium Trucks:	1,461.30		
Heavy Trucks:	1,467.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	61.376
Medium Trucks:	60.286
Heavy Trucks:	57.886

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-9.40	-1.44	-1.20	*-8.10*	0.000	0.000
Medium Trucks:	71.09	-26.64	-1.32	-1.20	*-9.24*	0.000	0.000
Heavy Trucks:	77.24	-30.59	-1.06	-1.20	*-12.40*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	47.4	45.5	43.7	37.7	46.3	46.9
Medium Trucks:	41.9	40.4	34.1	32.5	41.0	41.2
Heavy Trucks:	44.4	43.0	33.9	35.2	43.5	43.7
Vehicle Noise:	49.9	48.2	44.6	40.4	48.9	49.3

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	47.4	45.5	43.7	37.7	46.3	46.9
Medium Trucks:	41.9	40.4	34.1	32.5	41.0	41.2
Heavy Trucks:	44.4	43.0	33.9	35.2	43.5	43.7
Vehicle Noise:	49.9	48.2	44.6	40.4	48.9	49.3

Tuesday, March 18, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Fourth Floor With Wall
Road Name: Alta Vista
Lot No: Lot 67

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	100 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	80.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	32.0 feet
Pad Elevation:	1,459.1 feet
Road Elevation:	1,464.0 feet
Barrier Elevation:	1,464.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,464.00		
Medium Trucks:	1,466.30		
Heavy Trucks:	1,472.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	96.615
Medium Trucks:	95.996
Heavy Trucks:	94.681

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-9.40	-4.39	-1.20	*-9.60*	0.000	0.000
Medium Trucks:	71.09	-26.64	-4.35	-1.20	*-10.24*	0.000	0.000
Heavy Trucks:	77.24	-30.59	-4.26	-1.20	*-11.92*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	44.4	42.5	40.8	34.7	43.3	44.0
Medium Trucks:	38.9	37.4	31.0	29.5	37.9	38.2
Heavy Trucks:	41.2	39.8	30.7	32.0	40.3	40.5
Vehicle Noise:	46.9	45.2	41.6	37.4	45.9	46.3

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	44.4	42.5	40.8	34.7	43.3	44.0
Medium Trucks:	38.9	37.4	31.0	29.5	37.9	38.2
Heavy Trucks:	41.2	39.8	30.7	32.0	40.3	40.5
Vehicle Noise:	46.9	45.2	41.6	37.4	45.9	46.3

Tuesday, March 18, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Fourth Floor With Wall
Road Name: Santa Ana Canyon Rd.
Lot No: Lot 74

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	100 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	46.0 feet
Centerline Dist. to Observer:	66.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	32.0 feet
Pad Elevation:	1,460.6 feet
Road Elevation:	1,465.0 feet
Barrier Elevation:	1,465.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,465.00		
Medium Trucks:	1,467.30		
Heavy Trucks:	1,473.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	64.759
Medium Trucks:	63.814
Heavy Trucks:	61.773

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-9.40	-1.79	-1.20	*-7.78*	0.000	0.000
Medium Trucks:	71.09	-26.64	-1.69	-1.20	*-8.76*	0.000	0.000
Heavy Trucks:	77.24	-30.59	-1.48	-1.20	*-11.48*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	47.1	45.2	43.4	37.3	46.0	46.6
Medium Trucks:	41.6	40.1	33.7	32.1	40.6	40.8
Heavy Trucks:	44.0	42.5	33.5	34.8	43.1	43.2
Vehicle Noise:	49.5	47.8	44.2	40.0	48.5	48.9

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	47.1	45.2	43.4	37.3	46.0	46.6
Medium Trucks:	41.6	40.1	33.7	32.1	40.6	40.8
Heavy Trucks:	44.0	42.5	33.5	34.8	43.1	43.2
Vehicle Noise:	49.5	47.8	44.2	40.0	48.5	48.9

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Fourth Floor With Wall
Road Name: Santa Ana Canyon Rd.
Lot No: Lot 81

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	100 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	32.0 feet
Pad Elevation:	1,460.0 feet
Road Elevation:	1,463.0 feet
Barrier Elevation:	1,463.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,463.00		
Medium Trucks:	1,465.30		
Heavy Trucks:	1,471.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	60.008
Medium Trucks:	58.933
Heavy Trucks:	56.575

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-9.40	-1.29	-1.20	*-7.64*	0.000	0.000
Medium Trucks:	71.09	-26.64	-1.17	-1.20	*-8.77*	0.000	0.000
Heavy Trucks:	77.24	-30.59	-0.91	-1.20	*-11.92*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	47.5	45.7	43.9	37.8	46.5	47.1
Medium Trucks:	42.1	40.6	34.2	32.7	41.1	41.4
Heavy Trucks:	44.5	43.1	34.1	35.3	43.7	43.8
Vehicle Noise:	50.1	48.4	44.7	40.5	49.1	49.5

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	47.5	45.7	43.9	37.8	46.5	47.1
Medium Trucks:	42.1	40.6	34.2	32.7	41.1	41.4
Heavy Trucks:	44.5	43.1	34.1	35.3	43.7	43.8
Vehicle Noise:	50.1	48.4	44.7	40.5	49.1	49.5

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Second Floor With Wall
Road Name: Greenspot Rd.
Lot No: Lot 8

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,000 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	52 feet

Site Data

Barrier Height:	**6.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	60.0 feet
Centerline Dist. to Observer:	80.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	1,448.7 feet
Road Elevation:	1,451.0 feet
Barrier Elevation:	1,451.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,451.00		
Medium Trucks:	1,453.30		
Heavy Trucks:	1,459.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	48.753
Medium Trucks:	48.254
Heavy Trucks:	47.473

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	72.73	0.19	0.06	-1.20	*-0.07*	0.000	0.000
Medium Trucks:	79.85	-17.05	0.13	-1.20	*-0.18*	0.000	0.000
Heavy Trucks:	83.81	-21.01	0.23	-1.20	*-0.71*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.8	69.9	68.1	62.1	70.7	71.3
Medium Trucks:	61.7	60.2	53.9	52.3	60.8	61.0
Heavy Trucks:	61.8	60.4	51.4	52.6	61.0	61.1
Vehicle Noise:	72.6	70.7	68.4	62.9	71.5	72.0

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.8	69.9	68.1	62.1	70.7	71.3
Medium Trucks:	61.7	60.2	53.9	52.3	60.8	61.0
Heavy Trucks:	61.8	60.4	51.4	52.6	61.0	61.1
Vehicle Noise:	72.6	70.7	68.4	62.9	71.5	72.0

Tuesday, March 18, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Second Floor With Wall
Road Name: Greenspot Rd.
Lot No: Lot 106

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,000 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	52 feet

Site Data

Barrier Height:	**6.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	88.0 feet
Centerline Dist. to Observer:	108.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	1,463.0 feet
Road Elevation:	1,464.0 feet
Barrier Elevation:	1,464.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,464.00		
Medium Trucks:	1,466.30		
Heavy Trucks:	1,472.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	78.848
Medium Trucks:	78.502
Heavy Trucks:	77.929

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	72.73	0.19	-3.07	-1.20	*-0.45*	0.000	0.000
Medium Trucks:	79.85	-17.05	-3.04	-1.20	*-0.59*	0.000	0.000
Heavy Trucks:	83.81	-21.01	-2.99	-1.20	*-1.05*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.6	66.7	65.0	58.9	67.5	68.2
Medium Trucks:	58.6	57.1	50.7	49.1	57.6	57.8
Heavy Trucks:	58.6	57.2	48.2	49.4	57.8	57.9
Vehicle Noise:	69.4	67.6	65.2	59.8	68.4	68.9

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.6	66.7	65.0	58.9	67.5	68.2
Medium Trucks:	58.6	57.1	50.7	49.1	57.6	57.8
Heavy Trucks:	58.6	57.2	48.2	49.4	57.8	57.9
Vehicle Noise:	69.4	67.6	65.2	59.8	68.4	68.9

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Second Floor With Wall
Road Name: Alta Vista
Lot No: Lot 62

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	100 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	41.0 feet
Centerline Dist. to Observer:	61.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	1,457.0 feet
Road Elevation:	1,459.0 feet
Barrier Elevation:	1,459.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,459.00		
Medium Trucks:	1,461.30		
Heavy Trucks:	1,467.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	54.873
Medium Trucks:	54.416
Heavy Trucks:	53.693

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-9.40	-0.71	-1.20	*-1.96*	0.000	0.000
Medium Trucks:	71.09	-26.64	-0.65	-1.20	*-2.48*	0.000	0.000
Heavy Trucks:	77.24	-30.59	-0.57	-1.20	*-4.02*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	48.1	46.2	44.5	38.4	47.0	47.6
Medium Trucks:	42.6	41.1	34.7	33.2	41.6	41.9
Heavy Trucks:	44.9	43.5	34.4	35.7	44.0	44.2
Vehicle Noise:	50.6	48.9	45.3	41.0	49.6	50.0

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	48.1	46.2	44.5	38.4	47.0	47.6
Medium Trucks:	42.6	41.1	34.7	33.2	41.6	41.9
Heavy Trucks:	44.9	43.5	34.4	35.7	44.0	44.2
Vehicle Noise:	50.6	48.9	45.3	41.0	49.6	50.0

Tuesday, March 18, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Second Floor With Wall
Road Name: Alta Vista
Lot No: Lot 67

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	100 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	80.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	1,459.1 feet
Road Elevation:	1,464.0 feet
Barrier Elevation:	1,464.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,464.00		
Medium Trucks:	1,466.30		
Heavy Trucks:	1,472.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	93.182
Medium Trucks:	92.985
Heavy Trucks:	92.743

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-9.40	-4.16	-1.20	*-1.50*	0.000	0.000
Medium Trucks:	71.09	-26.64	-4.15	-1.20	*-1.72*	0.000	0.000
Heavy Trucks:	77.24	-30.59	-4.13	-1.20	*-2.35*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	44.7	42.8	41.0	35.0	43.6	44.2
Medium Trucks:	39.1	37.6	31.2	29.7	38.2	38.4
Heavy Trucks:	41.3	39.9	30.9	32.1	40.5	40.6
Vehicle Noise:	47.1	45.4	41.8	37.6	46.1	46.5

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	44.7	42.8	41.0	35.0	43.6	44.2
Medium Trucks:	39.1	37.6	31.2	29.7	38.2	38.4
Heavy Trucks:	41.3	39.9	30.9	32.1	40.5	40.6
Vehicle Noise:	47.1	45.4	41.8	37.6	46.1	46.5

Tuesday, March 18, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Second Floor With Wall
Road Name: Santa Ana Canyon Rd.
Lot No: Lot 74

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	100 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	46.0 feet
Centerline Dist. to Observer:	66.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	1,460.6 feet
Road Elevation:	1,465.0 feet
Barrier Elevation:	1,465.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,465.00		
Medium Trucks:	1,467.30		
Heavy Trucks:	1,473.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	59.365
Medium Trucks:	59.037
Heavy Trucks:	58.605

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-9.40	-1.22	-1.20	*-1.38*	0.000	0.000
Medium Trucks:	71.09	-26.64	-1.19	-1.20	*-1.76*	0.000	0.000
Heavy Trucks:	77.24	-30.59	-1.14	-1.20	*-2.91*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	47.6	45.7	44.0	37.9	46.5	47.1
Medium Trucks:	42.1	40.6	34.2	32.7	41.1	41.3
Heavy Trucks:	44.3	42.9	33.9	35.1	43.5	43.6
Vehicle Noise:	50.0	48.3	44.8	40.5	49.0	49.4

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	47.6	45.7	44.0	37.9	46.5	47.1
Medium Trucks:	42.1	40.6	34.2	32.7	41.1	41.3
Heavy Trucks:	44.3	42.9	33.9	35.1	43.5	43.6
Vehicle Noise:	50.0	48.3	44.8	40.5	49.0	49.4

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Second Floor With Wall
Road Name: Santa Ana Canyon Rd.
Lot No: Lot 81

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	100 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	14.0 feet
Pad Elevation:	1,460.0 feet
Road Elevation:	1,463.0 feet
Barrier Elevation:	1,463.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,463.00		
Medium Trucks:	1,465.30		
Heavy Trucks:	1,471.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	53.675
Medium Trucks:	53.252
Heavy Trucks:	52.621

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-9.40	-0.57	-1.20	*-1.66*	0.000	0.000
Medium Trucks:	71.09	-26.64	-0.51	-1.20	*-2.15*	0.000	0.000
Heavy Trucks:	77.24	-30.59	-0.44	-1.20	*-3.62*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	48.3	46.4	44.6	38.6	47.2	47.8
Medium Trucks:	42.7	41.2	34.9	33.3	41.8	42.0
Heavy Trucks:	45.0	43.6	34.6	35.8	44.2	44.3
Vehicle Noise:	50.7	49.0	45.4	41.2	49.7	50.1

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	48.3	46.4	44.6	38.6	47.2	47.8
Medium Trucks:	42.7	41.2	34.9	33.3	41.8	42.0
Heavy Trucks:	45.0	43.6	34.6	35.8	44.2	44.3
Vehicle Noise:	50.7	49.0	45.4	41.2	49.7	50.1

Tuesday, March 18, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Third Floor With Wall
Road Name: Greenspot Rd.
Lot No: Lot 8

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,000 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	52 feet

Site Data

Barrier Height:	**6.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	60.0 feet
Centerline Dist. to Observer:	80.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	23.0 feet
Pad Elevation:	1,448.7 feet
Road Elevation:	1,451.0 feet
Barrier Elevation:	1,451.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,451.00		
Medium Trucks:	1,453.30		
Heavy Trucks:	1,459.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	51.657
Medium Trucks:	50.781
Heavy Trucks:	49.001

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	72.73	0.19	-0.32	-1.20	*-1.48*	0.000	0.000
Medium Trucks:	79.85	-17.05	-0.20	-1.20	*-1.93*	0.000	0.000
Heavy Trucks:	83.81	-21.01	0.03	-1.20	*-3.33*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.4	69.5	67.7	61.7	70.3	70.9
Medium Trucks:	61.4	59.9	53.5	52.0	60.4	60.7
Heavy Trucks:	61.6	60.2	51.2	52.4	60.8	60.9
Vehicle Noise:	72.2	70.4	68.0	62.6	71.1	71.7

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	71.4	69.5	67.7	61.7	70.3	70.9
Medium Trucks:	61.4	59.9	53.5	52.0	60.4	60.7
Heavy Trucks:	61.6	60.2	51.2	52.4	60.8	60.9
Vehicle Noise:	72.2	70.4	68.0	62.6	71.1	71.7

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Third Floor With Wall
Road Name: Greenspot Rd.
Lot No: Lot 106

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	20,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	2,000 vehicles
Vehicle Speed:	55 mph
Near/Far Lane Distance:	52 feet

Site Data

Barrier Height:	**6.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	88.0 feet
Centerline Dist. to Observer:	108.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	23.0 feet
Pad Elevation:	1,463.0 feet
Road Elevation:	1,464.0 feet
Barrier Elevation:	1,464.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,464.00		
Medium Trucks:	1,466.30		
Heavy Trucks:	1,472.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	80.821
Medium Trucks:	80.226
Heavy Trucks:	79.018

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	72.73	0.19	-3.23	-1.20	*-2.94*	0.000	0.000
Medium Trucks:	79.85	-17.05	-3.18	-1.20	*-3.32*	0.000	0.000
Heavy Trucks:	83.81	-21.01	-3.08	-1.20	*-4.36*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.5	66.6	64.8	58.8	67.4	68.0
Medium Trucks:	58.4	56.9	50.5	49.0	57.5	57.7
Heavy Trucks:	58.5	57.1	48.1	49.3	57.7	57.8
Vehicle Noise:	69.3	67.4	65.1	59.6	68.2	68.7

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	68.5	66.6	64.8	58.8	67.4	68.0
Medium Trucks:	58.4	56.9	50.5	49.0	57.5	57.7
Heavy Trucks:	58.5	57.1	48.1	49.3	57.7	57.8
Vehicle Noise:	69.3	67.4	65.1	59.6	68.2	68.7

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Third Floor With Wall
Road Name: Alta Vista
Lot No: Lot 62

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	100 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	41.0 feet
Centerline Dist. to Observer:	61.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	23.0 feet
Pad Elevation:	1,457.0 feet
Road Elevation:	1,459.0 feet
Barrier Elevation:	1,459.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,459.00		
Medium Trucks:	1,461.30		
Heavy Trucks:	1,467.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	57.515
Medium Trucks:	56.717
Heavy Trucks:	55.098

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-9.40	-1.02	-1.20	*-4.95*	0.000	0.000
Medium Trucks:	71.09	-26.64	-0.92	-1.20	*-5.80*	0.000	0.000
Heavy Trucks:	77.24	-30.59	-0.74	-1.20	*-8.21*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	47.8	45.9	44.2	38.1	46.7	47.3
Medium Trucks:	42.3	40.8	34.5	32.9	41.4	41.6
Heavy Trucks:	44.7	43.3	34.3	35.5	43.9	44.0
Vehicle Noise:	50.3	48.6	45.0	40.8	49.3	49.7

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	47.8	45.9	44.2	38.1	46.7	47.3
Medium Trucks:	42.3	40.8	34.5	32.9	41.4	41.6
Heavy Trucks:	44.7	43.3	34.3	35.5	43.9	44.0
Vehicle Noise:	50.3	48.6	45.0	40.8	49.3	49.7

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Third Floor With Wall
Road Name: Alta Vista
Lot No: Lot 67

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	100 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	80.0 feet
Centerline Dist. to Observer:	100.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	23.0 feet
Pad Elevation:	1,459.1 feet
Road Elevation:	1,464.0 feet
Barrier Elevation:	1,464.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,464.00		
Medium Trucks:	1,466.30		
Heavy Trucks:	1,472.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	94.486
Medium Trucks:	94.073
Heavy Trucks:	93.284

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-9.40	-4.25	-1.20	*-5.12*	0.000	0.000
Medium Trucks:	71.09	-26.64	-4.22	-1.20	*-5.55*	0.000	0.000
Heavy Trucks:	77.24	-30.59	-4.17	-1.20	*-6.72*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	44.6	42.7	40.9	34.9	43.5	44.1
Medium Trucks:	39.0	37.5	31.2	29.6	38.1	38.3
Heavy Trucks:	41.3	39.9	30.8	32.1	40.4	40.6
Vehicle Noise:	47.0	45.3	41.7	37.5	46.0	46.4

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	44.6	42.7	40.9	34.9	43.5	44.1
Medium Trucks:	39.0	37.5	31.2	29.6	38.1	38.3
Heavy Trucks:	41.3	39.9	30.8	32.1	40.4	40.6
Vehicle Noise:	47.0	45.3	41.7	37.5	46.0	46.4

Tuesday, March 18, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Third Floor With Wall
Road Name: Santa Ana Canyon Rd.
Lot No: Lot 74

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	100 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	46.0 feet
Centerline Dist. to Observer:	66.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	23.0 feet
Pad Elevation:	1,460.6 feet
Road Elevation:	1,465.0 feet
Barrier Elevation:	1,465.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,465.00		
Medium Trucks:	1,467.30		
Heavy Trucks:	1,473.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	61.465
Medium Trucks:	60.809
Heavy Trucks:	59.533

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-9.40	-1.45	-1.20	*-4.35*	0.000	0.000
Medium Trucks:	71.09	-26.64	-1.38	-1.20	*-5.06*	0.000	0.000
Heavy Trucks:	77.24	-30.59	-1.24	-1.20	*-7.03*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	47.4	45.5	43.7	37.7	46.3	46.9
Medium Trucks:	41.9	40.4	34.0	32.5	40.9	41.2
Heavy Trucks:	44.2	42.8	33.8	35.0	43.4	43.5
Vehicle Noise:	49.9	48.1	44.5	40.3	48.8	49.3

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	47.4	45.5	43.7	37.7	46.3	46.9
Medium Trucks:	41.9	40.4	34.0	32.5	40.9	41.2
Heavy Trucks:	44.2	42.8	33.8	35.0	43.4	43.5
Vehicle Noise:	49.9	48.1	44.5	40.3	48.8	49.3

Tuesday, March 18, 2025

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - v10/31/19

Scenario: Third Floor With Wall
Road Name: Santa Ana Canyon Rd.
Lot No: Lot 81

Project Name: East Highland Technical Studies
Job Number: 15974
Analyst: N. Johnson

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	1,000 vehicles
Peak Hour Percentage:	10%
Peak Hour Volume:	100 vehicles
Vehicle Speed:	25 mph
Near/Far Lane Distance:	14 feet

Site Data

Barrier Height:	**0.0 feet**
Barrier Type (0-Wall, 1-Berm):	0.0
Centerline Dist. to Barrier:	40.0 feet
Centerline Dist. to Observer:	60.0 feet
Barrier Distance to Observer:	20.0 feet
Observer Height (Above Pad):	23.0 feet
Pad Elevation:	1,460.0 feet
Road Elevation:	1,463.0 feet
Barrier Elevation:	1,463.0 feet
Road Grade:	1.0%

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	1,463.00		
Medium Trucks:	1,465.30		
Heavy Trucks:	1,471.01	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	56.214
Medium Trucks:	55.438
Heavy Trucks:	53.887

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	59.44	-9.40	-0.87	-1.20	*-4.54*	0.000	0.000
Medium Trucks:	71.09	-26.64	-0.78	-1.20	*-5.37*	0.000	0.000
Heavy Trucks:	77.24	-30.59	-0.59	-1.20	*-7.73*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	48.0	46.1	44.3	38.3	46.9	47.5
Medium Trucks:	42.5	41.0	34.6	33.1	41.5	41.8
Heavy Trucks:	44.9	43.4	34.4	35.6	44.0	44.1
Vehicle Noise:	50.5	48.8	45.1	40.9	49.4	49.9

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	48.0	46.1	44.3	38.3	46.9	47.5
Medium Trucks:	42.5	41.0	34.6	33.1	41.5	41.8
Heavy Trucks:	44.9	43.4	34.4	35.6	44.0	44.1
Vehicle Noise:	50.5	48.8	45.1	40.9	49.4	49.9

APPENDIX 10.1:

CARRIER 50VR-A MANUFACTURER'S SPECIFICATIONS

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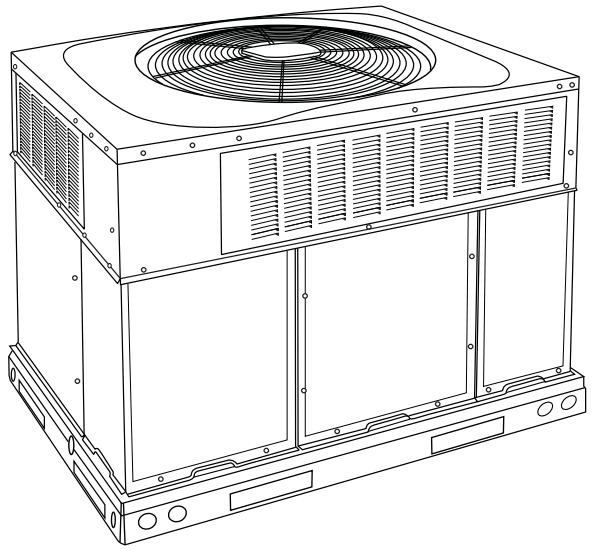
50VR–A, C
Performance™ 15 SEER 2–Stage Packaged Heat Pump System with Puron® (R–410A) Refrigerant
Single and Three Phase
2 to 5 Nominal Tons (Sizes 24–60)

Carrier
Turn to the experts

Product Data



A09033

Fig. 1 – Unit 50VR

Single–Packaged Products with Energy–Saving Features and Puron® refrigerant.

- 15.0–15.5 SEER / 12.0–12.5 EER at 95°F (35°C) OD
- 8.2 to 8.5 HSPF
- Factory–Installed TXV
- Multi–speed ECM Blower Motor – Standard
- Sound levels as low as 68dBA
- Two Stages of Cooling/Heating
- Dehumidification Feature – Standard
- Advanced Dehumidification Feature – Offered as a FIOP only
- Cabinet air leakage of 2.0% or less at .5 in. W.C. when tested in accordance with ASHRAE standard 193. (Low leak FIOP models only.)

FEATURES/BENEFITS

One–piece heat pump unit with optional electric heater, low sound levels, easy installation, low maintenance, and dependable performance.

Carrier's unique refrigerant designed to be environmentally balanced. Puron is an HFC refrigerant which does not contain chlorine that can harm the ozone layer. Puron refrigerant is in service in millions of systems proving highly reliable and is non–ozone depleting.

Easy Installation

Factory–assembled package is a compact, fully self–contained, electric cooling unit that is prewired, pre–piped, and pre–charged for minimum installation expense. These units are available in a variety of standard cooling sizes with voltage options to meet residential and light commercial requirements. Units are lightweight and install easily on a rooftop or at ground level. The high tech composite base eliminates rust problems associated with ground level applications.

Innovative Unit Base Design

On the inside a high–tech composite material will not rust and incorporates a sloped drain pan which improves drainage and helps inhibit mold, algae and bacterial growth. On the outside metal base rails provide added stability as well as easier handling and rigging.

Convertible duct configuration

Unit is designed for use in either downflow or horizontal applications. Each unit is converted from horizontal to downflow and includes horizontal duct covers. Downflow operation is provided in the field to allow vertical ductwork connections. The basepan seals on the bottom openings to ensure a positive seal in the vertical airflow mode.

Efficient operation High–efficiency design offers SEER (Seasonal Energy Efficiency Ratios) of up to 15.5 and HSPF of up to 8.5. (See page 4.)

Durable, dependable components

Scroll Compressors have 2 stages of cooling/heating and are designed for high efficiency. Each compressor is hermetically sealed against contamination to help promote longer life and dependable operation. Each compressor also has vibration isolation to provide quieter operation. All compressors have internal high pressure and overcurrent protection.

Multi–speed ECM Blower Motor is standard on all 50VR.

Direct–drive PSC (Permanent Split Capacitor) condenser–fan motors are designed to help reduce energy consumption and provide for cooing operation down to 40°F (4.4°C) outdoor temperature. Motormaster® II low ambient kit is available as a field–installed accessory.

Thermostatic Expansion Valve – A hard shutoff, balance port TXV maintains a constant superheat at the evaporator exit (cooling cycle) resulting in higher overall system efficiency.

Refrigerant system is designed to provide dependability. Liquid filter driers are used to promote clean, unrestricted operation. Each unit leaves the factory with a full refrigerant charge. Refrigerant service connections make checking operating pressures easier.

High and Low Pressure Switches provide added reliability for the compressor.

Indoor and Outdoor coils are computer–designed for optimum heat transfer and efficiency. The indoor coil is fabricated from copper tube and aluminum fins and is located inside the unit for protection against damage. The outdoor coil is internally mounted on the top tier of the unit.

Low sound ratings ensure a quiet indoor and outdoor environment with sound ratings as low as 68dBA. (See Page 4.)

Easy to service cabinets provide easy 3 panel accessibility to serviceable components during maintenance and installation. The basepan with integrated drain pan provides easy ground level installation with a mounting pad. A nesting feature ensures a positive basepan to roof curb seal when the unit is roof mounted. A

convenient 3/4-in. (19.05 mm) wide perimeter flange makes frame mounting on a rooftop easy.

Dehumidification Feature – Standard

This unit has independent fan speeds for low stage cooling and high stage cooling. In addition, 208/230 VAC models have the field-selectable capability to run a dehumidification ('DHUM') speed on high stage cooling (as low as 320CFM per ton). Coupled with the improved dehumidification associated with low stage cooling, the DHUM speed allows for a complete dehumidification solution independent of cooling stage. The dehumidification control must open the control circuit on humidity rise above the dehumidification set point.

NOTE: The dehumidification feature on high stage cooling does not support use of an economizer.

Advanced Dehumidification Feature (FIOP)

Units with the Advanced Dehumidification FIOP feature independent normal and dehumidification fan speeds for low stage cooling and high stage cooling.

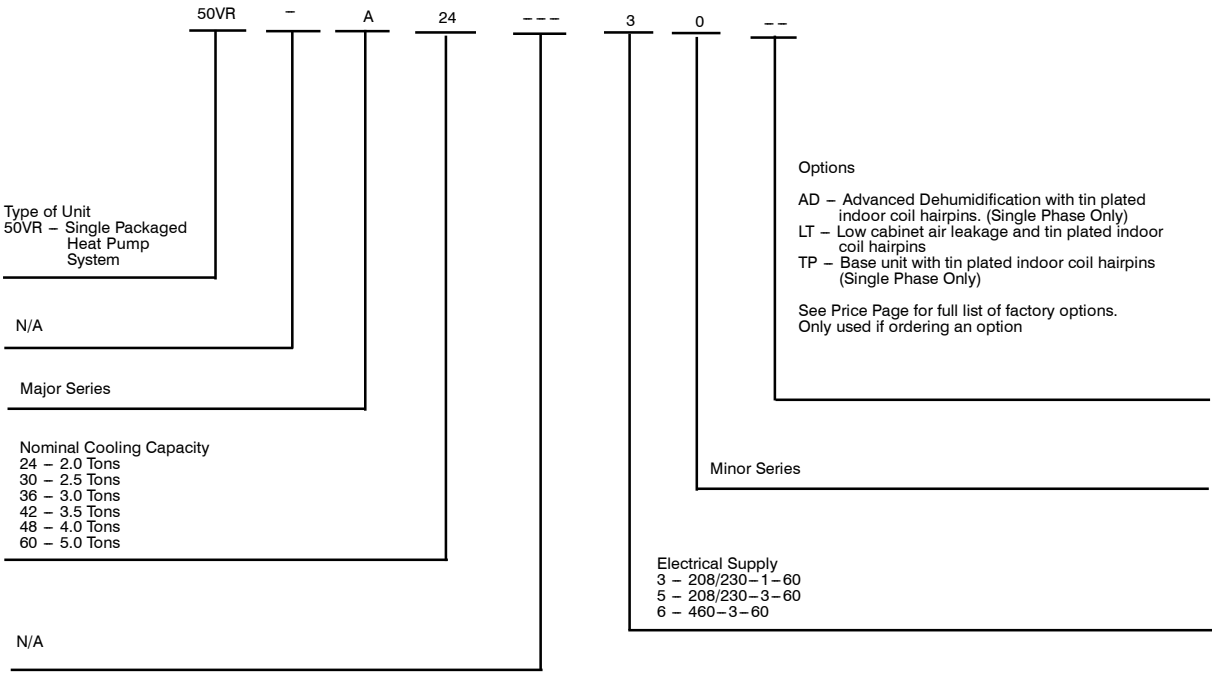
Standard horizontal metal duct covers with insulation come with the unit and cover the horizontal duct openings. These can be left in place if the units are converted to downflow.

Cabinets are constructed of heavyduty, phosphated, zinc-coated prepainted steel capable of withstanding 500 hours in salt spray. Interior surfaces of the evaporator/electric heater compartment are insulated with foil-faced insulation, which keeps the conditioned air from being affected by the outdoor ambient temperature and provides improved indoor air quality. (Conforms to American Society of Heating, Refrigeration and Air Conditioning Engineers No. 62P.) The sloped drain pan minimizes standing water in the drain. An external drain is provided.

Short-Cycling protection for the compressor is incorporated into our defrost control board ensuring a five minute delay (+/-2 minutes) before restarting compressor after shutdown for any reason.

TABLE OF CONTENTS

MODEL NUMBER NOMENCLATURE



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Use of the AHRI Certified TM Mark indicates a manufacturer's participation in the program For verification of certification for individual products, go to www.ahridirectory.org.

ASHRAE 90.1 COMPLIANT

energy ENERGY STAR

AHRI* CAPACITIES

Cooling Capacities and Efficiencies

Unit Model 50VR–C	Nominal Tons	Standard CFM (High / Low Stage)	Net Cooling Capacities - Btuh (High Stage)	EER @A**	SEER†
24	2	855 / 675	22800	12.0	15.0
30	2-1/2	1000 / 775	29400	12.0	15.0

Unit Model 50VR–A	Nominal Tons	Standard CFM (High / Low Stage)	Net Cooling Capacities - Btuh (High Stage)	EER @A**	SEER†
36	3	1200 / 900	34000	12.0	15.0
42	3-1/2	1400 / 1050	42000	12.0	15.0
48	4	1600 / 1200	47500	12.5	15.5
60	5	1750 / 1400	57000	12.0	15.0

Heat Pump Heating Capacities and Efficiencies

Unit Model 50VR–C	Heating Capacity (BTUH) @ 47_F (8.3_C)	COP @ 47_F (8.3_C)	Heating Capacity (BTUH) @ 17_F (---8.3_C)	COP @ 17_F (---8.3_C)	HSPF	Heating Cd
24	23,400	3.9	12200	2.3	8.2	0.25
30	30,000	3.7	16200	2.3	8.2	0.25

Unit Model 50VR–A	Heating Capacity (BTUH) @ 47_F (8.3_C)	COP @ 47_F (8.3_C)	Heating Capacity (BTUH) @ 17_F (---8.3_C)	COP @ 17_F (---8.3_C)	HSPF	Heating Cd
36	34,000	3.7	17200	2.3	8.2	0.25
42	42,000	3.6	24000	2.5	8.2	0.25
48	47,000	3.7	26000	2.3	8.2	0.25
60	57,000	3.5	32400	2.4	8.5	0.25

LEGEND
dB–Sound Levels (decibels)
db—Dry Bulb
SEER—Seasonal Energy Efficiency Ratio
wb—Wet Bulb
COP–Coefficient of Performance
* Air Conditioning, Heating & Refrigeration Institute.
**At "A" conditions–80°F (26.7°C) indoor db/67°F (19.4°C) indoor wb & 95°F (35°C) outdoor db.
† Rated in accordance with U.S. Government DOE Department of Energy) test procedures and/or AHRI Standards 210/240.

Notes:
1. Ratings are net values, reflecting the effects of circulating fan heat. Ratings are based on:
Cooling Standard: 80°F (26.7°C) db, 67°F wb (19.4°C) indoor entering–air temperature and 95°F db (35°C) outdoor entering–air temperature.
2. Before purchasing this appliance, read important energy cost and efficiency information available from AHRIdirectory.org.

A-WEIGHTED SOUND POWER LEVEL (dBA)

Model 50VR–C	Sound Ratings (dBA)	TYPICAL OCTAVE BAND SPECTRUM(dBA without tone adjustment)						
		125	250	500	1000	2000	4000	8000
24	68	77	65	65	63	57	52	48
30	69	70	66	67	65	58	56	54

Model 50VR–A	Sound Ratings (dBA)	TYPICAL OCTAVE BAND SPECTRUM(dBA without tone adjustment)						
		125	250	500	1000	2000	4000	8000
36	73	64	63.5	68	68	65.5	60.5	52.5
42	71	64	62	65	66	63.5	59.5	52.5
48	74	59.5	65	70	67	64.5	60.5	52.5
60	73	68	63	66	66	65	59.5	52.5

NOTE: Tested in accordance with AHRI Standard 270–1995 (not listed in AHRI).

PHYSICAL DATA

MODEL FAMILY	50VR–C		50VR–A			
UNIT SIZE	**24**	**30**	**36**	**42**	**48**	**60**
NOMINAL CAPACITY (ton)	2	2–1/2	3	3–1/2	4	5
SHIPPING WEIGHT lb.	347	393	420	466	462	511
SHIPPING WEIGHT (kg)	157	178	191	212	210	232
COMPRESSORS	Scroll					
Quantity	1					
REFRIGERANT (R–410A)						
Quantity lb	8.2	11.2	11.0	14.6	12.0	14.8
Quantity (kg)	3.7	5.1	5.0	6.6	5.4	6.7
REFRIGERANT METERING DEVICE	TXV, Indoor TXV					
ORIFICE						
ID (in.)	.032 (2)	.035 (1) .038 (1)	.042 (2)	.042 (2)	.042 (2)	.052 (2)
ID (mm)	0.81 (2)	.89 (1) .97 (1)	1.07 (2)	1.07 (2)	1.07 (2)	1.32 (2)
OUTDOOR COIL						
Rows...Fins/in.	1...21	2...21	2...21	2...21	2...21	2...21
Face Area (sq ft)	18.8	18.8	13.6	19.4	17.5	23.3
OUTDOOR FAN						
Nominal Cfm	2100	2500	3000	3000	3300	3600
Diameter in.	24	24	26	26	26	26
Diameter (mm)	609.6	609.6	660.4	660.4	660.4	660.4
Motor Hp (Rpm)	1/12 (800)	1/8 (810)	1/5 (810)	1/5 (810)	1/5 (810)	1/5 (810)
INDOOR COIL						
Rows...Fins/in.	3...17	3...17	3...17	3...17	3...17	4...17
Face Area (sq ft)	3.7	3.7	4.7	4.7	5.7	5.7
INDOOR BLOWER						
Nominal Low Stage Cooling Airflow (Cfm)	675	775	900	1050	1200	1400
Nominal High Stage Cooling Airflow (Cfm)	855	1000	1200	1400	1600	1750
Size in.	10x10	10x10	11x10	11x10	11x10	11x10
Size (mm.)	254x254	254x254	279.4x254	279.4x254	279.4x254	279.4x254
Motor HP (RPM)	1/2 (1050)	1/2 (1050)	3/4 (1000)	3/4 (1075)	1.0 (1075)	1.0 (1075)
HIGH–PRESSURE SWITCH (psig) Cut–out Reset (Auto)	650 +/– 15 420 +/– 25					
LOW–PRESSURE SWITCH (psig) cut–out Reset (auto)	20 +/– 5 45 +/– 5					
RETURN–AIR FILTERS†‡						
Throwaway Size in.	20x20x1	20x24x1	24x30x1		24x36x1	
Throwaway Size (mm)	508x508x25	508x610x25	610x762x25		610x914x25	

† Required filter sizes shown are based on the larger of the AHRI (Air Conditioning Heating and Refrigeration Institute) rated cooling airflow or the heating airflow velocity of 300 ft/minute for throwaway type or 450 ft/minute for high–capacity type. Air filter pressure drop for non–standard filters must not exceed 0.08 in. W.C.

‡ If using accessory filter rack refer to the filter rack installation instructions for correct filter sizes and quantity.

Electric Heat Pressure Drop Tables (IN. W.C.)

Small Cabinet: 24–30

STATIC	STANDARD CFM (SCFM)											
	500	**600**	**700**	**800**	**900**	**1000**	**1100**	**1200**	**1300**	**1400**	**1500**	**1600**
5 kW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.06	0.07
10 kW	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.06	0.07	0.09	0.10	0.11
15 kW	0.00	0.00	0.00	0.02	0.04	0.06	0.08	0.10	0.12	0.14	0.16	0.18
20 kW	0.00	0.00	0.02	0.04	0.06	0.08	0.09	0.11	0.13	0.15	0.17	0.19

Large Cabinet: 36–60

STATIC	STANDARD CFM (SCFM)														
	1100	**1200**	**1300**	**1400**	**1500**	**1600**	**1700**	**1800**	**1900**	**2000**	**2100**	**2200**	**2300**	**2400**	**2500**
5 kW	0.00	0.00	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12
10 kW	0.00	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13
15 kW	0.00	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15
20 kW	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15	0.16

OPTIONS AND ACCESSORIES

ITEM	DESCRIPTION	FACTORY INSTALLED OPTION	FIELD INSTALLED ACCESSORY
Coil Options	Base unit with tin plated indoor coil hairpins	X	
Compressor Start Kit	Compressor Start Kit assists compressor start–up by providing additional starting torque on sing phase units only.		X
Corporate Thermostats	Thermostats provide control for the system heating, cooling and dehumidification functions.		X
Crankcase Heater	Crankcase Heater provides anti–floodback protection for low–load cooling applications.		X*
Economizer	Vertical Economizer with Jade Honeywell W7220 Controller, Honeywell communicating actuator, and dry bulb sensor. (Contact MicroMetl Customer Service at 1–800–662–4822 to order.)		X
	Horizontal Economizer with Jade Honeywell W7220 Controller, Honeywell communicating actuator, and dry bulb sensor. (Contact MicroMetl Customer Service at 1–800–662–4822 to order.)		X
Electric Heaters	Electric Heat Supplement		X
Filter Rack	Filter Rack features easy installation, serviceability, and high–filtering performance for horizontal and vertical applications. Includes 1–in. filter.		X
Flat Roof Curb	14–in. (356 mm) Flat Roof Curb is available for roof mounted applications.		X
Low Ambient Kit	Low Ambient Kit (Motormaster II Control) allows the use of mechanical cooling down to outdoor temperatures as low as 0°F (–18° C) when properly installed.		X
Manual Outside Air Damper	Manual Outside Air Damper includes hood and filter rack with adjustable damper blade for up to 25% outdoor air.		X
Square–to–Round Duct Transition Kit	Square–to–Round Duct Transition Kit enable 24–48 size units to be fitted to 14 in (356 mm). round ductwork.		X
Time Guard II	Automatically prevents the compressor from restarting for at least 4 minutes and 45 seconds after shutdown of the compressor. Not required when a corporate programmable thermostat is applied or with a RTU–MP control.		X
Low Cabinet Air Leakage	Cabinet air leakage of 2.0% or less at .5 in. W.C. when tested in accordance with ASHRAE standard 193.	X	
Dual Point Electric Heaters	Allows you to power the electric heater and unit contactor separately by having two individual field power supply circuits connected respectively.		X
Advanced Dehumidification Package	Standard unit with tin plated indoor coil hairpins and a dedicated DEHUM features that enables owner controlled dehumidification.	X	

*Refer to Price Page for application detail.

Electric Heaters

CATALOG ORDERING NO.	NOMINAL CAPACITY (kW)	FUSE QTY	USED WITH SIZES					
			24	30	36	42	48	60
ELECTRIC HEATERS (208/230 — SINGLE PHASE — 60 Hz)								
CPHEATER052B00	5.0	–	X	X	X			
CPHEATER064B00	5.0	4	X	X	X	X	X	X
CPHEATER069B00	7.2	–	X					
CPHEATER070B00	7.2	4	X	X	X	X	X	X
CPHEATER050B00	10.0	4	X	X	X	X	X	X
CPHEATER066B00	15.0	6			X	X	X	X
CPHEATER133B00	15.0	4		X				
CPHEATER054B00	20.0	6				X	X	X
ELECTRIC HEATERS (208/230 — THREE PHASE — 60 Hz)								
CPHEATER055B00	5.0	–		X	X	X	X	X
CPHEATER056B00	10.0	–		X	X	X	X	
CPHEATER068B00	10.0	6			X	X	X	X
CPHEATER058B00	15.0	6		X	X	X	X	X
CPHEATER059B00	20.0	6				X	X	X
ELECTRIC HEATERS (460 — THREE PHASE — 60 Hz)								
CPHEATER061B00	10.0	–			X	X	X	X
CPHEATER062B00	15.0	–			X	X	X	X
CPHEATER063B00	20.0	–				X	X	X

NOTE: Electric heaters are rated at 240v. Refer to Multiplication Factors table for other voltages.
X = Approved combinations.

Minimum Airflow for Safe Electric Heater Operation (CFM)

SIZE	24	30	36	42	48	60
Cfm	800	1000	1200	1400	1600	1750

UNIT DIMENSIONS - 50VR-C24-30

UNIT	ELECTRICAL CHARACTERISTICS	UNIT WT.		UNIT HEIGHT IN/MM		CENTER OF GRAVITY IN/MM					
		LB	KG	"A"		X		Y		Z	
50VR-C24---30*	208/230-1-60	338	153.3	51-3/4	1315	20-1/2	520.7	15-3/4	400.1	23.0	584.2
50VR-C30---30*	208/230-1-60	384	174.2	51-3/4	1315	20-1/2	520.7	15-3/4	400.1	23.0	584.2
50VR-C30---50*	208/230-3-60	384	174.2	51-3/4	1315	20-1/2	520.7	15-3/4	400.1	23.0	584.2

UNIT	VOLTAGE	CORNER WEIGHT LB/KG							
		"1"		"2"		"3"		"4"	
50VR-C24---30*	208/230	47.3	21.5	60.8	27.6	87.9	39.9	142.0	64.4
50VR-C30---30*	208/230	53.8	24.4	69.1	31.4	99.8	45.3	161.3	73.2
50VR-C30---50*	208/230	53.8	24.4	69.1	31.4	99.8	45.3	161.3	73.2

NOTE: 1. ALL TABLE DATA RELEVANT FOR ALL FACTORY INSTALLED OPTIONS EXCEPT ECONOMIZER.
2. * - INDICATES ALL FIOP CODES FOR THE MODELS LISTED.

REQUIRED CLEARANCES TO COMBUSTIBLE MATL.

	INCHES [MM]
TOP OF UNIT	14 [355.6]
DUCT SIDE OF UNIT	2 [50.8]
SIDE OPPOSITE DUCTS	14 [355.6]
BOTTOM OF UNIT	0 [0.0]
ELECTRICAL PANEL	36 [914.4]

NEC. REQUIRED CLEARANCES.

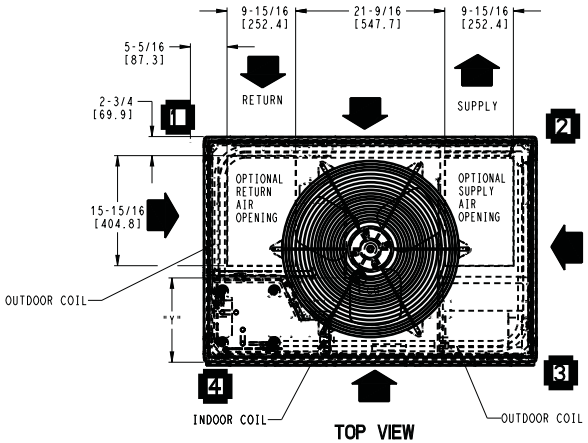
	INCHES [MM]
BETWEEN UNITS, POWER ENTRY SIDE	42 [1066.8]
UNIT AND UNGROUNDED SURFACES, POWER ENTRY SIDE	36 [914.0]
UNIT AND BLOCK OR CONCRETE WALLS AND OTHER GROUNDED SURFACES, POWER ENTRY SIDE	42 [1066.8]

REQUIRED CLEARANCE FOR OPERATION AND SERVICING

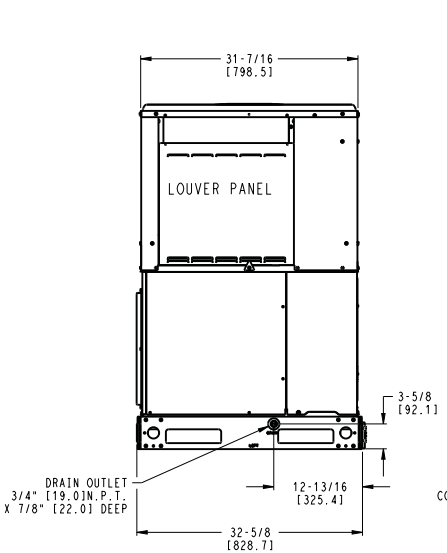
	INCHES [MM]
EVAP. COIL ACCESS SIDE	36 [914.0]
POWER ENTRY SIDE	42 [1066.8]
(EXCEPT FOR NEC REQUIREMENTS)	
UNIT TOP	48 [1219.2]
SIDE OPPOSITE DUCTS	36 [914.0]
DUCT PANEL	12 [304.8]*

*MINIMUM DISTANCES: IF UNIT IS PLACED LESS THAN 12 [304.8] FROM WALL SYSTEM, THEN SYSTEM PERFORMANCE MAYBE COMPROMISED.

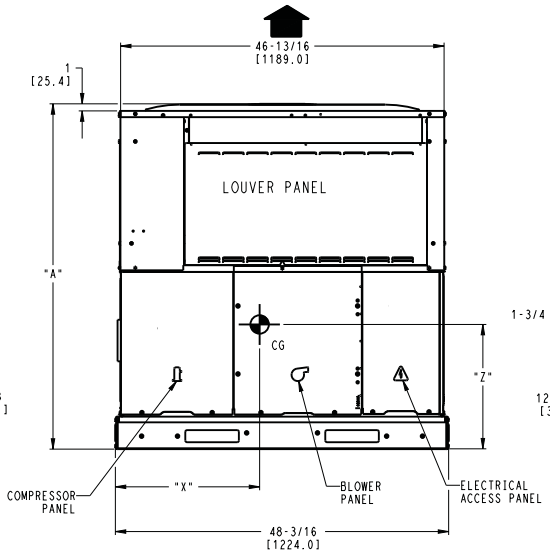
DIMENSIONS IN [] ARE IN MILLIMETERS



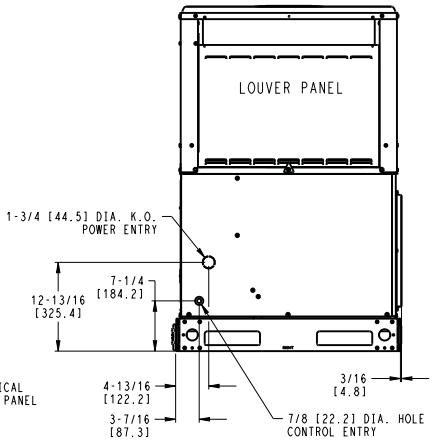
TOP VIEW



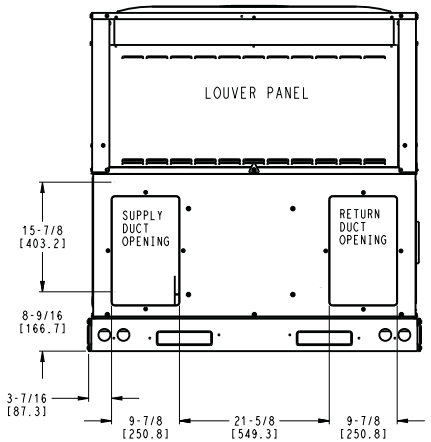
LEFT SIDE VIEW



FRONT VIEW



RIGHT SIDE VIEW



REAR VIEW

50VR500267	A

50VR

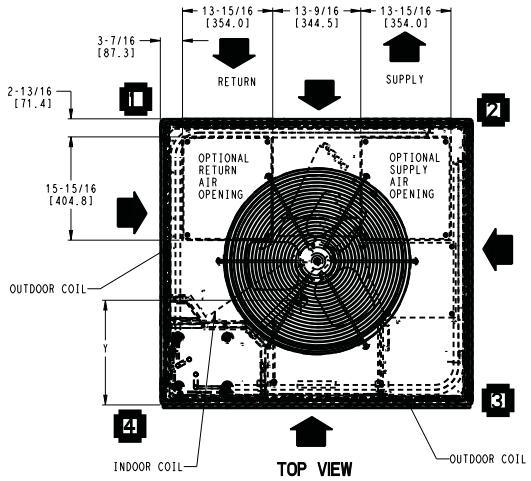
A180108

50VR-A36-60 UNIT DIMENSIONS

UNIT	ELECTRICAL CHARACTERISTICS	UNIT WT.		UNIT HEIGHT IN/MM		CENTER OF GRAVITY IN/MM					
		LB	KG	"A"		X		Y		Z	
50VR-A36---(3/5/6)0*	208/230-1, 208/230-3-60, 460-3	413	187.3	44-3/4	1137	20-1/4	514.4	17-1/2	444.5	17-5/8	447.7
50VR-A42---(3/5/6)0*	208/230-1, 208/230-3-60, 460-3	444	201.4	50-3/4	1289	20-1/4	514.4	17-1/2	444.5	17-5/8	447.7
50VR-A48---(3/5/6)0*	208/230-1, 208/230-3-60, 460-3	447	202.8	48-3/4	1238	20-1/4	514.4	17-1/2	444.5	17-5/8	447.7
50VR-A60---(3/5/6)0*	208/230-1, 208/230-3-60, 460-3	503	228.2	54-3/4	1391	20-1/4	514.4	17-1/2	444.5	18	457.2

UNIT	VOLTAGE	CORNER WEIGHTS LB/KG							
		"1"		"2"		"3"		"4"	
50VR-A36---(3/5/6)0*	208/230/460	49.6	28.1	66.1	37.5	99.1	56.2	165.2	65.6
50VR-A42---(3/5/6)0*	208/230/460	53.3	30.2	71.0	40.3	106.6	60.4	177.6	70.5
50VR-A48---(3/5/6)0*	208/230/460	53.6	30.4	71.5	40.6	107.3	60.8	178.8	71.0
50VR-A60---(3/5/6)0*	208/230/460	60.4	34.2	80.5	45.6	120.7	68.4	201.2	79.9

NOTE: 1. ALL TABLE DATA RELEVANT FOR ALL FACTORY INSTALLED OPTIONS EXCEPT ECONOMIZER.
2. * - INDICATES ALL FIOP CODES FOR THE MODELS LISTED.



TOP VIEW

REQUIRED CLEARANCES TO COMBUSTIBLE MATL.

	INCHES [MM]
TOP OF UNIT	14 [355.6]
DUCT SIDE OF UNIT	2 [50.8]
SIDE OPPOSITE DUCTS	14 [355.6]
BOTTOM OF UNIT	0 [0.0]
ELECTRICAL PANEL	36 [914.4]

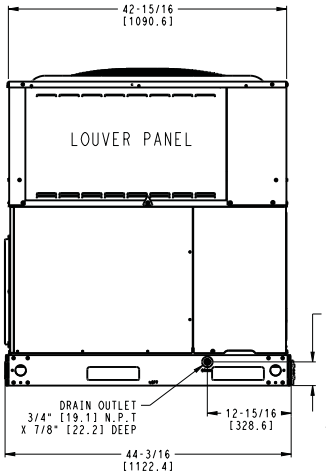
NEC. REQUIRED CLEARANCES.

	INCHES [MM]
BETWEEN UNITS, POWER ENTRY SIDE	42 [1066.8]
UNIT AND UNGROUNDED SURFACES, POWER ENTRY SIDE	36 [914.0]
UNIT AND BLOCK OR CONCRETE WALLS AND OTHER GROUNDED SURFACES, POWER ENTRY SIDE	42 [1066.8]

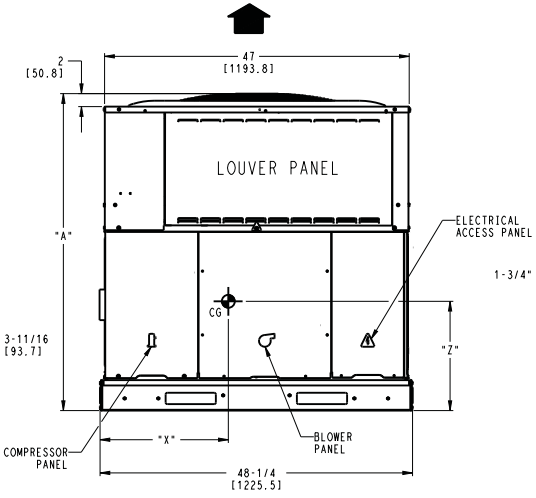
REQUIRED CLEARANCE FOR OPERATION AND SERVICING

	INCHES [MM]
EVAP. COIL ACCESS SIDE	36 [914.0]
POWER ENTRY SIDE	42 [1066.8]
(EXCEPT FOR NEC REQUIREMENTS)	
UNIT TOP	48 [1219.2]
SIDE OPPOSITE DUCTS	36 [914.0]
DUCT PANEL	12 [304.8]*

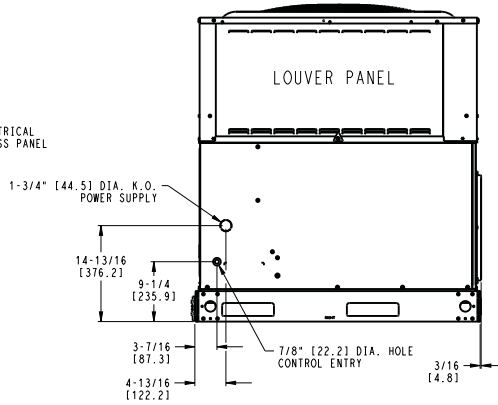
*MINIMUM DISTANCES: IF UNIT IS PLACED LESS THAN 12 [304.8] FROM WALL SYSTEM, THEN SYSTEM PERFORMANCE MAYBE COMPROMISED.
DIMENSIONS IN [] ARE IN MM



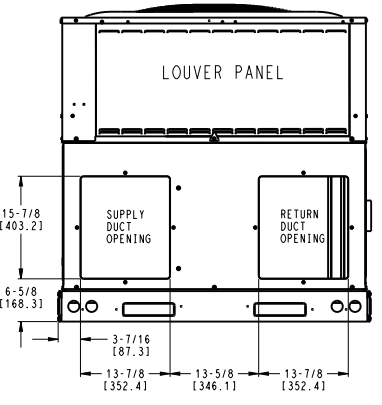
LEFT SIDE VIEW



FRONT VIEW



RIGHT SIDE VIEW



REAR VIEW

50VR500141	A

A180107

APPENDIX 10.2:

CADNAA OPERATIONAL NOISE MODEL INPUTS

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15974 - East Highland

CadnaA Noise Prediction Model: 15974-02_Operation.cna
Date: 25.11.24
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 Rvcr - 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	19.4	16.5	23.2	0.0	0.0	0.0		x	Total	5.00	r	6291271.03	2348713.72	5.00	
R2		R2	36.6	33.8	40.5	0.0	0.0	0.0		x	Total	5.00	r	6289276.24	2349507.12	5.00	
R3		R3	29.5	26.7	33.4	0.0	0.0	0.0		x	Total	5.00	r	6288505.84	2349854.34	5.00	
R4		R4	25.7	22.8	29.6	0.0	0.0	0.0		x	Total	5.00	r	6287834.18	2349848.92	5.00	

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		675.00	0.00	270.00	3.00	r	6288895.72	2349530.89	3.00
AC002		AC002	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288931.14	2349505.20	3.00
AC003		AC003	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288970.72	2349489.23	3.00
AC004		AC004	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289010.31	2349475.34	3.00
AC005		AC005	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289048.50	2349461.45	3.00
AC006		AC006	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289091.56	2349445.48	3.00
AC007		AC007	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289133.92	2349430.20	3.00
AC008		AC008	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289172.81	2349411.45	3.00
AC009		AC009	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289228.36	2349360.76	3.00
AC010		AC010	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289228.36	2349314.23	3.00
AC011		AC011	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289229.06	2349275.34	3.00
AC012		AC012	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289229.06	2349228.81	3.00
AC013		AC013	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289229.06	2349185.76	3.00
AC014		AC014	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289228.36	2349142.70	3.00
AC015		AC015	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289228.36	2349102.42	3.00
AC016		AC016	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289131.83	2349088.53	3.00

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)
AC017		AC017	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289090.17	2349088.53	3.00
AC018		AC018	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289045.72	2349091.31	3.00
AC019		AC019	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289005.44	2349091.31	3.00
AC020		AC020	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288961.69	2349091.31	3.00
AC021		AC021	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288939.47	2349092.01	3.00
AC022		AC022	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288867.94	2349205.20	3.00
AC023		AC023	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288867.25	2349223.26	3.00
AC024		AC024	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288872.11	2349263.53	3.00
AC025		AC025	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288910.31	2349374.64	3.00
AC026		AC026	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288929.75	2349367.70	3.00
AC027		AC027	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288981.83	2349307.28	3.00
AC028		AC028	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288982.53	2349266.31	3.00
AC029		AC029	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288981.83	2349221.17	3.00
AC030		AC030	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288991.56	2349221.17	3.00
AC031		AC031	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288991.56	2349264.92	3.00
AC032		AC032	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288993.64	2349287.14	3.00
AC033		AC033	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289103.36	2349284.37	3.00
AC034		AC034	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289114.47	2349283.67	3.00
AC035		AC035	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289113.78	2349239.92	3.00
AC036		AC036	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289103.36	2349239.23	3.00
AC037		AC037	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289104.06	2349217.01	3.00
AC038		AC038	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289113.78	2349217.01	3.00
AC039		AC039	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289058.22	2349331.59	3.00
AC040		AC040	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289016.56	2349346.87	3.00
AC041		AC041	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288995.03	2349353.81	3.00
AC042		AC042	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288932.53	2349377.42	3.00
AC043		AC043	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288913.08	2349384.37	3.00
AC044		AC044	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288961.69	2348946.87	3.00
AC045		AC045	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288972.81	2348926.73	3.00
AC046		AC046	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289000.58	2348930.89	3.00
AC047		AC047	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289057.53	2348926.73	3.00
AC048		AC048	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289152.67	2348828.72	3.00
AC049		AC049	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289130.53	2348822.73	3.00
AC050		AC050	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289087.56	2348811.54	3.00
AC051		AC051	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6289038.60	2348798.52	3.00
AC052		AC052	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288974.02	2348797.73	3.00
AC053		AC053	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288951.62	2348799.04	3.00
AC054		AC054	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288907.09	2348798.52	3.00
AC055		AC055	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288844.64	2348915.88	3.00
AC056		AC056	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288825.11	2348894.61	3.00
AC057		AC057	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288782.52	2349405.17	3.00
AC058		AC058	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288767.16	2349405.95	3.00
AC059		AC059	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288694.50	2349402.30	3.00
AC060		AC060	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288678.09	2349401.26	3.00
AC061		AC061	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288605.70	2349398.14	3.00
AC062		AC062	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288589.81	2349397.88	3.00
AC063		AC063	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288524.19	2349393.97	3.00
AC064		AC064	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288504.40	2349393.19	3.00
AC065		AC065	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288440.07	2349389.54	3.00
AC066		AC066	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288420.28	2349387.72	3.00
AC067		AC067	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288411.43	2349193.19	3.00
AC068		AC068	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288411.69	2349174.44	3.00
AC069		AC069	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288412.47	2349100.74	3.00
AC070		AC070	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288411.95	2349082.51	3.00
AC071		AC071	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288412.47	2349009.33	3.00
AC072		AC072	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288412.47	2348992.67	3.00
AC073		AC073	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288411.95	2348949.96	3.00
AC074		AC074	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288523.41	2348935.38	3.00
AC075		AC075	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288523.67	2348956.21	3.00
AC076		AC076	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288523.67	2349023.14	3.00
AC077		AC077	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288524.19	2349041.36	3.00
AC078		AC078	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288523.15	2349108.55	3.00
AC079		AC079	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288524.71	2349126.26	3.00
AC080		AC080	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288522.89	2349192.93	3.00
AC081		AC081	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288524.19	2349278.34	3.00
AC082		AC082	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288568.72	2349280.43	3.00
AC083		AC083	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288608.82	2349281.99	3.00
AC084		AC084	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288653.09	2349284.07	3.00
AC085		AC085	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288692.94	2349285.90	3.00
AC086		AC086	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288737.99	2349287.72	3.00
AC087		AC087	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288762.47	2349301.26	3.00
AC088		AC088	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288745.02	2349261.42	3.00
AC089		AC089	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288725.49	2349220.79	3.00
AC090		AC090	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288721.84	2349204.65	3.00
AC091		AC091	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288681.48	2349224.44	3.00
AC092		AC092	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288640.86	2349244.75	3.00
AC093		AC093	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288600.75	2349265.06	3.00

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)
AC094		AC094	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288580.70	2349159.33	3.00
AC095		AC095	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288597.11	2349152.04	3.00
AC096		AC096	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288637.21	2349131.21	3.00
AC097		AC097	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288677.31	2349110.90	3.00
AC098		AC098	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288549.97	2349051.26	3.00
AC099		AC099	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288614.03	2349017.67	3.00
AC100		AC100	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288629.92	2349010.11	3.00
AC101		AC101	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288624.97	2348999.44	3.00
AC102		AC102	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288588.77	2349015.84	3.00
AC103		AC103	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288573.93	2349024.96	3.00
AC104		AC104	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288560.39	2348905.95	3.00
AC105		AC105	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288577.31	2348897.88	3.00
AC106		AC106	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288762.99	2349034.33	3.00
AC107		AC107	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288746.32	2348998.40	3.00
AC108		AC108	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288738.25	2348982.25	3.00
AC109		AC109	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288708.04	2348917.41	3.00
AC110		AC110	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288699.71	2348899.18	3.00
AC111		AC111	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288671.32	2348839.02	3.00
AC112		AC112	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288663.51	2348821.83	3.00
AC113		AC113	76.0	76.0	76.0	Lw	76		675.00	0.00	270.00	3.00	r	6288645.02	2348783.03	3.00

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)		
PARK01		PARK01	75.6	75.6	75.6	56.7	56.7	56.7	Lw	75.6		900.00	0.00	270.00	0.	r
PARK02		PARK02	77.4	77.4	77.4	56.3	56.3	56.3	Lw	77.4		900.00	0.00	270.00	0.	r
PARK03		PARK03	80.1	80.1	80.1	56.9	56.9	56.9	Lw	80.1		900.00	0.00	270.00	0.	r
PARK04		PARK04	79.9	79.9	79.9	56.6	56.6	56.6	Lw	79.9		900.00	0.00	270.00	0.	r
PARK05		PARK05	78.3	78.3	78.3	56.5	56.5	56.5	Lw	78.3		900.00	0.00	270.00	0.	r
PARK06		PARK06	78.3	78.3	78.3	56.1	56.1	56.1	Lw	78.3		900.00	0.00	270.00	0.	r
PARK07		PARK07	80.0	80.0	80.0	56.8	56.8	56.8	Lw	80		900.00	0.00	270.00	0.	r
PARK08		PARK08	78.3	78.3	78.3	56.4	56.4	56.4	Lw	78.3		900.00	0.00	270.00	0.	r
PARK09		PARK09	75.3	75.3	75.3	56.2	56.2	56.2	Lw	75.3		900.00	0.00	270.00	0.	r
PARK10		PARK10	73.0	73.0	73.0	56.3	56.3	56.3	Lw	73.0		900.00	0.00	270.00	0.	r
PARK11		PARK11	80.2	80.2	80.2	56.4	56.4	56.4	Lw	80.2		900.00	0.00	270.00	0.	r
PARK12		PARK12	73.6	73.6	73.6	56.4	56.4	56.4	Lw	73.6		900.00	0.00	270.00	0.	r

Name	ID	Height			Coordinates			
		Begin		End	x	y	z	Ground
		(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
PARK01	PARK01	0.00	r		6288809.50	2349605.11	0.00	0.00
					6288836.76	2349587.14	0.00	0.00
					6288824.17	2349565.44	0.00	0.00
					6288795.96	2349582.80	0.00	0.00
PARK02	PARK02	0.00	r		6289098.48	2349343.65	0.00	0.00
					6289110.63	2349372.73	0.00	0.00
					6289150.13	2349354.07	0.00	0.00
					6289139.28	2349324.99	0.00	0.00
PARK03	PARK03	0.00	r		6289143.62	2349178.72	0.00	0.00
					6289144.92	2349146.61	0.00	0.00
					6289072.87	2349148.78	0.00	0.00
					6289073.30	2349180.03	0.00	0.00
PARK04	PARK04	0.00	r		6289023.39	2349180.46	0.00	0.00
					6289023.83	2349148.78	0.00	0.00
					6288952.21	2349149.64	0.00	0.00
					6288952.64	2349182.20	0.00	0.00
PARK05	PARK05	0.00	r		6288839.36	2349257.28	0.00	0.00
					6288816.36	2349209.54	0.00	0.00
					6288788.15	2349222.13	0.00	0.00
					6288812.45	2349270.74	0.00	0.00
PARK06	PARK06	0.00	r		6288498.22	2349260.32	0.00	0.00
					6288517.75	2349257.72	0.00	0.00
					6288537.28	2349251.21	0.00	0.00
					6288554.64	2349242.96	0.00	0.00
					6288541.19	2349215.62	0.00	0.00

Name	ID	Height				Coordinates			
		Begin		End		x	y	z	Ground
		(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
						6288493.44	2349229.07	0.00	0.00
PARK07	PARK07	0.00	r			6288437.45	2349303.72	0.00	0.00
						6288468.27	2349304.59	0.00	0.00
						6288467.84	2349230.37	0.00	0.00
						6288437.02	2349231.24	0.00	0.00
PARK08	PARK08	0.00	r			6288545.96	2348894.87	0.00	0.00
						6288593.70	2348871.43	0.00	0.00
						6288581.55	2348842.79	0.00	0.00
						6288531.64	2348867.53	0.00	0.00
PARK09	PARK09	0.00	r			6289085.46	2348902.25	0.00	0.00
						6289110.20	2348909.63	0.00	0.00
						6289121.05	2348878.81	0.00	0.00
						6289093.70	2348871.87	0.00	0.00
PARK10	PARK10	0.00	r			6288904.47	2348867.09	0.00	0.00
						6288927.04	2348885.76	0.00	0.00
						6288937.45	2348874.47	0.00	0.00
						6288914.88	2348852.77	0.00	0.00
PARK11	PARK11	0.00	r			6289164.02	2348924.82	0.00	0.00
						6289198.74	2348933.50	0.00	0.00
						6289214.36	2348872.30	0.00	0.00
						6289172.70	2348861.45	0.00	0.00
						6289167.49	2348879.24	0.00	0.00
PARK12	PARK12	0.00	r			6288894.51	2349278.03	0.00	0.00
						6288925.24	2349277.77	0.00	0.00
						6288925.24	2349259.54	0.00	0.00
						6288894.25	2349260.06	0.00	0.00

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)
BUILDING			BUILDING00001	x	0		14.00	r	6289172.89	2348838.50	14.00	0.00
									6289144.41	2348830.17	14.00	0.00
									6289134.69	2348864.89	14.00	0.00
									6289163.51	2348873.22	14.00	0.00
BUILDING			BUILDING00002	x	0		14.00	r	6289125.66	2348862.11	14.00	0.00
									6289134.34	2348827.74	14.00	0.00
									6289102.75	2348818.01	14.00	0.00
									6289094.07	2348849.61	14.00	0.00
									6289106.57	2348853.08	14.00	0.00
									6289105.18	2348857.60	14.00	0.00
BUILDING			BUILDING00003	x	0		14.00	r	6289082.61	2348850.31	14.00	0.00
									6289091.98	2348816.28	14.00	0.00
									6289059.69	2348807.25	14.00	0.00
									6289050.32	2348841.28	14.00	0.00
BUILDING			BUILDING00004	x	0		14.00	r	6289041.29	2348840.58	14.00	0.00
									6289045.11	2348805.17	14.00	0.00
									6289011.08	2348802.39	14.00	0.00
									6289007.96	2348832.94	14.00	0.00
									6289021.15	2348834.68	14.00	0.00
									6289020.46	2348838.85	14.00	0.00
BUILDING			BUILDING00005	x	0		14.00	r	6288997.19	2348838.15	14.00	0.00
									6288997.54	2348803.08	14.00	0.00
									6288967.68	2348802.04	14.00	0.00
									6288967.68	2348838.50	14.00	0.00
BUILDING			BUILDING00006	x	0		14.00	r	6288957.61	2348838.15	14.00	0.00
									6288958.65	2348802.74	14.00	0.00
									6288924.62	2348802.74	14.00	0.00
									6288924.62	2348834.33	14.00	0.00
									6288937.12	2348833.99	14.00	0.00
									6288937.47	2348838.85	14.00	0.00
BUILDING			BUILDING00007	x	0		14.00	r	6288913.51	2348838.50	14.00	0.00
									6288913.86	2348803.08	14.00	0.00
									6288879.83	2348803.08	14.00	0.00
									6288879.83	2348839.19	14.00	0.00
BUILDING			BUILDING00008	x	0		14.00	r	6288814.55	2348871.83	14.00	0.00
									6288832.61	2348895.44	14.00	0.00
									6288860.04	2348873.22	14.00	0.00
									6288840.59	2348849.96	14.00	0.00
BUILDING			BUILDING00009	x	0		14.00	r	6288846.50	2348910.03	14.00	0.00

Name	Sel.	M.	ID	RB	Residents	Absorption	Height		Coordinates			
							Begin		x	y	z	Ground
							(ft)		(ft)	(ft)	(ft)	(ft)
									6288872.89	2348930.17	14.00	0.00
									6288893.37	2348902.04	14.00	0.00
									6288866.98	2348881.21	14.00	0.00
BUILDING			BUILDING00010	x	0		14.00	r	6288943.03	2348968.01	14.00	0.00
									6288959.69	2348937.81	14.00	0.00
									6288929.48	2348920.79	14.00	0.00
									6288912.82	2348950.65	14.00	0.00
BUILDING			BUILDING00011	x	0		14.00	r	6288964.90	2348927.74	14.00	0.00
									6288981.57	2348898.92	14.00	0.00
									6288954.48	2348883.29	14.00	0.00
									6288947.89	2348894.75	14.00	0.00
									6288944.07	2348893.71	14.00	0.00
									6288934.69	2348912.46	14.00	0.00
BUILDING			BUILDING00012	x	0		14.00	r	6288995.46	2348925.31	14.00	0.00
									6289028.09	2348925.31	14.00	0.00
									6289029.14	2348889.89	14.00	0.00
									6288995.11	2348889.89	14.00	0.00
BUILDING			BUILDING00013	x	0		14.00	r	6289066.98	2348920.79	14.00	0.00
									6289076.36	2348886.76	14.00	0.00
									6289048.23	2348878.43	14.00	0.00
									6289038.16	2348913.85	14.00	0.00
BUILDING			BUILDING00014	x	0		14.00	r	6288914.21	2349132.94	14.00	0.00
									6288947.89	2349132.60	14.00	0.00
									6288947.54	2349097.18	14.00	0.00
									6288914.21	2349097.53	14.00	0.00
BUILDING			BUILDING00015	x	0		14.00	r	6288957.61	2349131.90	14.00	0.00
									6288977.75	2349131.90	14.00	0.00
									6288978.09	2349128.43	14.00	0.00
									6288990.94	2349128.08	14.00	0.00
									6288990.59	2349096.83	14.00	0.00
									6288956.91	2349096.83	14.00	0.00
BUILDING			BUILDING00016	x	0		14.00	r	6289002.05	2349131.56	14.00	0.00
									6289031.91	2349131.21	14.00	0.00
									6289032.26	2349095.79	14.00	0.00
									6289001.36	2349096.14	14.00	0.00
BUILDING			BUILDING00017	x	0		14.00	r	6289041.64	2349130.51	14.00	0.00
									6289062.12	2349130.51	14.00	0.00
									6289061.78	2349127.04	14.00	0.00
									6289074.28	2349126.00	14.00	0.00
									6289075.32	2349095.44	14.00	0.00
									6289041.29	2349095.79	14.00	0.00
BUILDING			BUILDING00018	x	0		14.00	r	6289085.73	2349130.51	14.00	0.00
									6289114.90	2349129.47	14.00	0.00
									6289115.25	2349094.06	14.00	0.00
									6289086.08	2349094.75	14.00	0.00
BUILDING			BUILDING00019	x	0		14.00	r	6289125.66	2349129.82	14.00	0.00
									6289159.00	2349128.78	14.00	0.00
									6289159.00	2349093.01	14.00	0.00
									6289124.97	2349094.40	14.00	0.00
BUILDING			BUILDING00020	x	0		14.00	r	6289189.55	2349126.69	14.00	0.00
									6289224.28	2349127.74	14.00	0.00
									6289224.28	2349096.83	14.00	0.00
									6289189.21	2349096.49	14.00	0.00
BUILDING			BUILDING00021	x	0		14.00	r	6288872.89	2349209.33	14.00	0.00
									6288906.22	2349208.99	14.00	0.00
									6288906.57	2349173.92	14.00	0.00
									6288872.54	2349174.26	14.00	0.00
BUILDING			BUILDING00022	x	0		14.00	r	6288872.19	2349249.61	14.00	0.00
									6288906.57	2349249.96	14.00	0.00
									6288906.91	2349218.71	14.00	0.00
									6288871.84	2349219.40	14.00	0.00
BUILDING			BUILDING00023	x	0		14.00	r	6288860.04	2349306.90	14.00	0.00
									6288871.84	2349302.74	14.00	0.00
									6288873.23	2349307.25	14.00	0.00
									6288892.33	2349299.26	14.00	0.00
									6288881.57	2349265.93	14.00	0.00
									6288849.97	2349278.08	14.00	0.00
BUILDING			BUILDING00024	x	0		14.00	r	6289189.55	2349173.22	14.00	0.00
									6289224.28	2349173.22	14.00	0.00
									6289223.93	2349138.15	14.00	0.00
									6289193.03	2349138.85	14.00	0.00
									6289193.72	2349151.35	14.00	0.00
									6289189.21	2349151.35	14.00	0.00
BUILDING			BUILDING00025	x	0		14.00	r	6289224.28	2349212.81	14.00	0.00
									6289223.93	2349182.60	14.00	0.00
									6289189.21	2349182.94	14.00	0.00
									6289189.21	2349214.19	14.00	0.00

Name	Sel.	M.	ID	RB	Residents	Absorption	Height		Coordinates			
							Begin		x	y	z	Ground
							(ft)		(ft)	(ft)	(ft)	(ft)
BUILDING			BUILDING00026	x	0		14.00	r	6289153.79	2349222.18	14.00	0.00
									6289153.79	2349192.32	14.00	0.00
									6289119.07	2349192.32	14.00	0.00
									6289118.72	2349222.88	14.00	0.00
BUILDING			BUILDING00027	x	0		14.00	r	6289099.62	2349222.88	14.00	0.00
									6289099.28	2349193.01	14.00	0.00
									6289065.25	2349193.36	14.00	0.00
									6289065.59	2349224.61	14.00	0.00
BUILDING			BUILDING00028	x	0		14.00	r	6289031.57	2349224.96	14.00	0.00
									6289031.57	2349194.06	14.00	0.00
									6288996.84	2349194.06	14.00	0.00
									6288996.84	2349225.31	14.00	0.00
BUILDING			BUILDING00029	x	0		14.00	r	6288977.40	2349225.31	14.00	0.00
									6288976.71	2349195.10	14.00	0.00
									6288942.68	2349196.14	14.00	0.00
									6288943.03	2349226.69	14.00	0.00
BUILDING			BUILDING00030	x	0		14.00	r	6288946.84	2349270.44	14.00	0.00
									6288976.71	2349269.75	14.00	0.00
									6288977.05	2349235.03	14.00	0.00
									6288942.33	2349236.42	14.00	0.00
									6288941.98	2349255.86	14.00	0.00
									6288946.84	2349256.56	14.00	0.00
BUILDING			BUILDING00031	x	0		14.00	r	6289028.09	2349268.71	14.00	0.00
									6289027.75	2349255.51	14.00	0.00
									6289030.87	2349255.17	14.00	0.00
									6289031.22	2349234.68	14.00	0.00
									6288996.50	2349234.68	14.00	0.00
									6288996.50	2349269.75	14.00	0.00
BUILDING			BUILDING00032	x	0		14.00	r	6289069.07	2349268.36	14.00	0.00
									6289099.62	2349267.67	14.00	0.00
									6289099.28	2349233.64	14.00	0.00
									6289064.90	2349234.33	14.00	0.00
									6289064.90	2349254.47	14.00	0.00
									6289068.37	2349255.17	14.00	0.00
BUILDING			BUILDING00033	x	0		14.00	r	6289149.97	2349266.97	14.00	0.00
									6289150.32	2349253.78	14.00	0.00
									6289154.14	2349253.43	14.00	0.00
									6289154.14	2349232.94	14.00	0.00
									6289118.72	2349233.29	14.00	0.00
									6289119.41	2349268.36	14.00	0.00
BUILDING			BUILDING00034	x	0		14.00	r	6289190.25	2349258.99	14.00	0.00
									6289224.28	2349258.99	14.00	0.00
									6289223.58	2349224.61	14.00	0.00
									6289193.72	2349224.96	14.00	0.00
									6289193.37	2349238.50	14.00	0.00
									6289188.86	2349238.50	14.00	0.00
BUILDING			BUILDING00035	x	0		14.00	r	6289223.93	2349299.61	14.00	0.00
									6289224.28	2349269.06	14.00	0.00
									6289190.59	2349269.75	14.00	0.00
									6289189.90	2349300.31	14.00	0.00
BUILDING			BUILDING00036	x	0		14.00	r	6289154.14	2349311.76	14.00	0.00
									6289153.44	2349278.08	14.00	0.00
									6289118.72	2349278.78	14.00	0.00
									6289119.76	2349313.85	14.00	0.00
BUILDING			BUILDING00037	x	0		14.00	r	6289099.62	2349313.50	14.00	0.00
									6289099.62	2349279.47	14.00	0.00
									6289064.90	2349279.47	14.00	0.00
									6289064.55	2349314.19	14.00	0.00
BUILDING			BUILDING00038	x	0		14.00	r	6289031.22	2349314.89	14.00	0.00
									6289030.87	2349280.17	14.00	0.00
									6288996.84	2349281.21	14.00	0.00
									6288996.50	2349315.58	14.00	0.00
BUILDING			BUILDING00039	x	0		14.00	r	6288976.71	2349311.42	14.00	0.00
									6288977.05	2349280.86	14.00	0.00
									6288943.37	2349281.21	14.00	0.00
									6288942.33	2349312.46	14.00	0.00
BUILDING			BUILDING00040	x	0		14.00	r	6289193.72	2349344.40	14.00	0.00
									6289223.93	2349344.06	14.00	0.00
									6289224.28	2349310.03	14.00	0.00
									6289189.55	2349310.03	14.00	0.00
									6289189.90	2349331.56	14.00	0.00
									6289193.37	2349331.21	14.00	0.00
BUILDING			BUILDING00041	x	0		14.00	r	6289223.93	2349385.72	14.00	0.00
									6289224.28	2349355.17	14.00	0.00
									6289189.55	2349355.86	14.00	0.00
									6289190.25	2349386.07	14.00	0.00
BUILDING			BUILDING00042	x	0		14.00	r	6289144.07	2349415.24	14.00	0.00

Name	Sel.	M.	ID	RB	Residents	Absorption	Height		Coordinates			
							Begin		x	y	z	Ground
							(ft)		(ft)	(ft)	(ft)	(ft)
									6289174.28	2349401.35	14.00	0.00
									6289161.78	2349372.53	14.00	0.00
									6289150.66	2349378.43	14.00	0.00
									6289147.89	2349374.96	14.00	0.00
									6289131.22	2349383.99	14.00	0.00
BUILDING			BUILDING00043	x	0		14.00	r	6289107.26	2349431.90	14.00	0.00
									6289134.69	2349420.10	14.00	0.00
									6289121.50	2349387.81	14.00	0.00
									6289093.37	2349401.35	14.00	0.00
BUILDING			BUILDING00044	x	0		14.00	r	6289055.18	2349371.14	14.00	0.00
									6289046.15	2349341.97	14.00	0.00
									6289013.51	2349353.78	14.00	0.00
									6289024.62	2349387.11	14.00	0.00
									6289043.37	2349379.82	14.00	0.00
									6289042.33	2349376.35	14.00	0.00
BUILDING			BUILDING00045	x	0		14.00	r	6289094.41	2349360.72	14.00	0.00
									6289083.65	2349328.78	14.00	0.00
									6289056.22	2349338.15	14.00	0.00
									6289065.59	2349372.53	14.00	0.00
BUILDING			BUILDING00046	x	0		14.00	r	6289063.51	2349449.26	14.00	0.00
									6289094.76	2349437.46	14.00	0.00
									6289084.00	2349404.13	14.00	0.00
									6289052.40	2349415.58	14.00	0.00
BUILDING			BUILDING00047	x	0		14.00	r	6288954.83	2349353.08	14.00	0.00
									6288944.76	2349323.22	14.00	0.00
									6288932.61	2349328.08	14.00	0.00
									6288931.91	2349324.26	14.00	0.00
									6288912.47	2349330.51	14.00	0.00
									6288922.89	2349365.24	14.00	0.00
BUILDING			BUILDING00048	x	0		14.00	r	6288983.30	2349401.69	14.00	0.00
									6289015.25	2349389.89	14.00	0.00
									6289004.14	2349356.21	14.00	0.00
									6288972.54	2349367.32	14.00	0.00
BUILDING			BUILDING00049	x	0		14.00	r	6288970.80	2349402.04	14.00	0.00
									6288961.08	2349372.18	14.00	0.00
									6288929.14	2349383.99	14.00	0.00
									6288940.25	2349416.97	14.00	0.00
									6288959.34	2349410.03	14.00	0.00
									6288959.00	2349406.21	14.00	0.00
BUILDING			BUILDING00050	x	0		14.00	r	6288913.51	2349368.01	14.00	0.00
									6288902.40	2349333.99	14.00	0.00
									6288871.84	2349345.79	14.00	0.00
									6288880.87	2349380.17	14.00	0.00
BUILDING			BUILDING00051	x	0		14.00	r	6288898.93	2349432.60	14.00	0.00
									6288930.53	2349420.79	14.00	0.00
									6288920.11	2349387.46	14.00	0.00
									6288888.16	2349398.57	14.00	0.00
BUILDING			BUILDING00052	x	0		14.00	r	6289051.36	2349453.08	14.00	0.00
									6289041.98	2349423.22	14.00	0.00
									6289029.14	2349428.08	14.00	0.00
									6289028.09	2349423.57	14.00	0.00
									6289010.04	2349430.51	14.00	0.00
									6289020.11	2349464.54	14.00	0.00
BUILDING			BUILDING00053	x	0		14.00	r	6288972.19	2349481.56	14.00	0.00
									6288962.47	2349451.35	14.00	0.00
									6288950.32	2349456.21	14.00	0.00
									6288948.58	2349452.04	14.00	0.00
									6288929.14	2349459.68	14.00	0.00
									6288939.90	2349493.36	14.00	0.00
BUILDING			BUILDING00054	x	0		14.00	r	6288902.75	2349505.86	14.00	0.00
									6288930.87	2349496.14	14.00	0.00
									6288920.11	2349463.15	14.00	0.00
									6288891.64	2349473.57	14.00	0.00
BUILDING			BUILDING00055	x	0		14.00	r	6288897.89	2349523.22	14.00	0.00
									6288886.78	2349489.89	14.00	0.00
									6288854.83	2349501.35	14.00	0.00
									6288865.94	2349534.68	14.00	0.00
BUILDING			BUILDING00056	x	0		14.00	r	6288813.86	2349402.39	14.00	0.00
									6288815.94	2349366.63	14.00	0.00
									6288782.26	2349365.24	14.00	0.00
									6288779.83	2349400.65	14.00	0.00
BUILDING			BUILDING00057	x	0		14.00	r	6288770.46	2349400.31	14.00	0.00
									6288772.54	2349364.89	14.00	0.00
									6288752.05	2349363.85	14.00	0.00
									6288751.36	2349368.01	14.00	0.00
									6288738.86	2349367.32	14.00	0.00
									6288736.78	2349398.92	14.00	0.00

Name	Sel.	M.	ID	RB	Residents	Absorption	Height		Coordinates			
							Begin		x	y	z	Ground
							(ft)		(ft)	(ft)	(ft)	(ft)
BUILDING			BUILDING00058	x	0		14.00	r	6288725.32	2349398.57	14.00	0.00
									6288727.40	2349362.46	14.00	0.00
									6288694.07	2349361.07	14.00	0.00
									6288691.29	2349397.18	14.00	0.00
BUILDING			BUILDING00059	x	0		14.00	r	6288681.57	2349396.49	14.00	0.00
									6288683.65	2349360.72	14.00	0.00
									6288663.86	2349360.38	14.00	0.00
									6288662.82	2349364.54	14.00	0.00
									6288649.28	2349363.50	14.00	0.00
									6288648.23	2349394.75	14.00	0.00
BUILDING			BUILDING00060	x	0		14.00	r	6288636.43	2349394.06	14.00	0.00
									6288638.51	2349359.33	14.00	0.00
									6288604.48	2349357.25	14.00	0.00
									6288602.75	2349393.36	14.00	0.00
BUILDING			BUILDING00061	x	0		14.00	r	6288593.03	2349392.67	14.00	0.00
									6288594.41	2349357.25	14.00	0.00
									6288574.62	2349355.51	14.00	0.00
									6288574.28	2349360.38	14.00	0.00
									6288561.08	2349359.68	14.00	0.00
									6288559.34	2349391.63	14.00	0.00
BUILDING			BUILDING00062	x	0		14.00	r	6288548.58	2349390.24	14.00	0.00
									6288551.36	2349355.51	14.00	0.00
									6288520.80	2349354.13	14.00	0.00
									6288518.72	2349389.19	14.00	0.00
BUILDING			BUILDING00063	x	0		14.00	r	6288509.00	2349388.85	14.00	0.00
									6288510.73	2349353.43	14.00	0.00
									6288490.59	2349352.39	14.00	0.00
									6288490.59	2349356.21	14.00	0.00
									6288477.40	2349355.86	14.00	0.00
									6288475.66	2349387.46	14.00	0.00
BUILDING			BUILDING00064	x	0		14.00	r	6288464.21	2349386.76	14.00	0.00
									6288466.98	2349351.35	14.00	0.00
									6288437.12	2349350.31	14.00	0.00
									6288435.04	2349385.72	14.00	0.00
BUILDING			BUILDING00065	x	0		14.00	r	6288425.32	2349384.68	14.00	0.00
									6288427.05	2349349.61	14.00	0.00
									6288407.61	2349348.92	14.00	0.00
									6288406.91	2349353.08	14.00	0.00
									6288393.03	2349352.04	14.00	0.00
									6288391.29	2349383.99	14.00	0.00
BUILDING			BUILDING00066	x	0		14.00	r	6288779.83	2349326.00	14.00	0.00
									6288810.73	2349311.42	14.00	0.00
									6288795.46	2349279.82	14.00	0.00
									6288764.90	2349296.14	14.00	0.00
BUILDING			BUILDING00067	x	0		14.00	r	6288737.82	2349326.00	14.00	0.00
									6288739.21	2349291.28	14.00	0.00
									6288706.22	2349289.89	14.00	0.00
									6288704.48	2349321.49	14.00	0.00
									6288716.98	2349322.53	14.00	0.00
									6288716.64	2349325.65	14.00	0.00
BUILDING			BUILDING00068	x	0		14.00	r	6288693.03	2349324.61	14.00	0.00
									6288695.11	2349289.19	14.00	0.00
									6288664.90	2349287.81	14.00	0.00
									6288663.51	2349323.22	14.00	0.00
BUILDING			BUILDING00069	x	0		14.00	r	6288653.79	2349322.53	14.00	0.00
									6288655.53	2349287.11	14.00	0.00
									6288622.19	2349285.72	14.00	0.00
									6288620.46	2349318.36	14.00	0.00
									6288633.65	2349318.36	14.00	0.00
									6288632.96	2349322.18	14.00	0.00
BUILDING			BUILDING00070	x	0		14.00	r	6288609.34	2349320.44	14.00	0.00
									6288611.08	2349285.03	14.00	0.00
									6288581.22	2349283.99	14.00	0.00
									6288579.48	2349320.10	14.00	0.00
BUILDING			BUILDING00071	x	0		14.00	r	6288569.41	2349319.40	14.00	0.00
									6288571.50	2349282.94	14.00	0.00
									6288537.82	2349281.56	14.00	0.00
									6288536.43	2349314.19	14.00	0.00
									6288549.28	2349314.54	14.00	0.00
									6288549.62	2349318.71	14.00	0.00
BUILDING			BUILDING00072	x	0		14.00	r	6288525.66	2349317.32	14.00	0.00
									6288527.75	2349281.56	14.00	0.00
									6288493.37	2349280.86	14.00	0.00
									6288492.33	2349315.93	14.00	0.00
BUILDING			BUILDING00073	x	0		14.00	r	6288760.73	2349286.42	14.00	0.00
									6288788.16	2349272.18	14.00	0.00
									6288781.91	2349260.03	14.00	0.00

Name	Sel.	M.	ID	RB	Residents	Absorption	Height		Coordinates			
							Begin		x	y	z	Ground
							(ft)		(ft)	(ft)	(ft)	(ft)
									6288786.08	2349257.94	14.00	0.00
									6288777.05	2349239.54	14.00	0.00
									6288745.80	2349255.17	14.00	0.00
BUILDING			BUILDING00074	x	0		14.00	r	6288772.54	2349228.78	14.00	0.00
									6288757.96	2349197.88	14.00	0.00
									6288726.71	2349214.54	14.00	0.00
									6288741.29	2349245.79	14.00	0.00
BUILDING			BUILDING00075	x	0		14.00	r	6288747.19	2349187.46	14.00	0.00
									6288731.91	2349155.17	14.00	0.00
									6288701.71	2349171.49	14.00	0.00
									6288716.98	2349202.39	14.00	0.00
BUILDING			BUILDING00076	x	0		14.00	r	6288707.26	2349207.60	14.00	0.00
									6288694.07	2349179.47	14.00	0.00
									6288681.91	2349185.72	14.00	0.00
									6288680.53	2349181.56	14.00	0.00
									6288662.12	2349191.28	14.00	0.00
									6288676.36	2349223.22	14.00	0.00
BUILDING			BUILDING00077	x	0		14.00	r	6288666.64	2349228.43	14.00	0.00
									6288651.71	2349196.83	14.00	0.00
									6288621.15	2349211.42	14.00	0.00
									6288636.43	2349243.36	14.00	0.00
BUILDING			BUILDING00078	x	0		14.00	r	6288626.71	2349248.57	14.00	0.00
									6288613.51	2349219.75	14.00	0.00
									6288601.71	2349226.35	14.00	0.00
									6288600.32	2349222.53	14.00	0.00
									6288581.22	2349232.25	14.00	0.00
									6288596.50	2349263.85	14.00	0.00
BUILDING			BUILDING00079	x	0		14.00	r	6288446.15	2349222.18	14.00	0.00
									6288446.15	2349208.29	14.00	0.00
									6288449.97	2349207.94	14.00	0.00
									6288450.32	2349187.11	14.00	0.00
									6288414.21	2349187.81	14.00	0.00
									6288415.94	2349222.53	14.00	0.00
BUILDING			BUILDING00080	x	0		14.00	r	6288520.46	2349197.18	14.00	0.00
									6288520.46	2349166.97	14.00	0.00
									6288485.73	2349168.01	14.00	0.00
									6288485.39	2349198.57	14.00	0.00
BUILDING			BUILDING00081	x	0		14.00	r	6288450.32	2349176.69	14.00	0.00
									6288449.62	2349143.36	14.00	0.00
									6288415.59	2349142.67	14.00	0.00
									6288415.25	2349178.43	14.00	0.00
BUILDING			BUILDING00082	x	0		14.00	r	6288485.73	2349143.36	14.00	0.00
									6288489.55	2349143.01	14.00	0.00
									6288489.90	2349156.90	14.00	0.00
									6288520.46	2349156.56	14.00	0.00
									6288520.46	2349121.14	14.00	0.00
									6288485.04	2349122.18	14.00	0.00
BUILDING			BUILDING00083	x	0		14.00	r	6288540.59	2349141.63	14.00	0.00
									6288553.44	2349169.40	14.00	0.00
									6288584.34	2349154.47	14.00	0.00
									6288569.07	2349122.53	14.00	0.00
									6288549.62	2349131.90	14.00	0.00
									6288552.05	2349135.03	14.00	0.00
BUILDING			BUILDING00084	x	0		14.00	r	6288593.03	2349149.96	14.00	0.00
									6288622.54	2349134.33	14.00	0.00
									6288608.65	2349103.43	14.00	0.00
									6288578.09	2349118.36	14.00	0.00
BUILDING			BUILDING00085	x	0		14.00	r	6288633.30	2349129.47	14.00	0.00
									6288662.82	2349114.54	14.00	0.00
									6288649.28	2349086.42	14.00	0.00
									6288638.51	2349093.36	14.00	0.00
									6288636.08	2349087.81	14.00	0.00
									6288618.37	2349098.22	14.00	0.00
BUILDING			BUILDING00086	x	0		14.00	r	6288446.15	2349130.51	14.00	0.00
									6288446.50	2349117.32	14.00	0.00
									6288449.97	2349117.67	14.00	0.00
									6288449.97	2349096.14	14.00	0.00
									6288415.59	2349096.14	14.00	0.00
									6288415.25	2349130.86	14.00	0.00
BUILDING			BUILDING00087	x	0		14.00	r	6288485.73	2349111.76	14.00	0.00
									6288520.46	2349112.81	14.00	0.00
									6288520.46	2349081.21	14.00	0.00
									6288485.39	2349081.56	14.00	0.00
BUILDING			BUILDING00088	x	0		14.00	r	6288673.58	2349109.33	14.00	0.00
									6288703.79	2349094.75	14.00	0.00
									6288688.86	2349062.11	14.00	0.00
									6288658.30	2349077.74	14.00	0.00

Name	Sel.	M.	ID	RB	Residents	Absorption	Height		Coordinates			
							Begin		x	y	z	Ground
							(ft)		(ft)	(ft)	(ft)	(ft)
BUILDING			BUILDING00089	x	0		14.00	r	6288772.89	2349063.15	14.00	0.00
									6288757.96	2349032.25	14.00	0.00
									6288727.05	2349047.53	14.00	0.00
									6288742.33	2349078.78	14.00	0.00
BUILDING			BUILDING00090	x	0		14.00	r	6288754.48	2349022.53	14.00	0.00
									6288741.64	2348995.79	14.00	0.00
									6288709.69	2349011.76	14.00	0.00
									6288723.23	2349039.54	14.00	0.00
BUILDING			BUILDING00091	x	0		14.00	r	6288673.93	2349031.21	14.00	0.00
									6288659.34	2349000.31	14.00	0.00
									6288628.79	2349014.89	14.00	0.00
									6288643.37	2349046.83	14.00	0.00
BUILDING			BUILDING00092	x	0		14.00	r	6288614.90	2349057.25	14.00	0.00
									6288616.64	2349060.72	14.00	0.00
									6288635.39	2349051.35	14.00	0.00
									6288620.11	2349019.75	14.00	0.00
									6288589.90	2349035.38	14.00	0.00
									6288602.75	2349063.15	14.00	0.00
BUILDING			BUILDING00093	x	0		14.00	r	6288594.07	2349072.18	14.00	0.00
									6288578.44	2349040.24	14.00	0.00
									6288548.58	2349055.86	14.00	0.00
									6288563.16	2349087.81	14.00	0.00
BUILDING			BUILDING00094	x	0		14.00	r	6288520.46	2349070.10	14.00	0.00
									6288520.11	2349036.42	14.00	0.00
									6288485.73	2349036.07	14.00	0.00
									6288485.39	2349057.25	14.00	0.00
									6288489.55	2349057.60	14.00	0.00
									6288489.21	2349070.44	14.00	0.00
BUILDING			BUILDING00095	x	0		14.00	r	6288450.32	2349086.07	14.00	0.00
									6288450.32	2349051.69	14.00	0.00
									6288416.29	2349052.04	14.00	0.00
									6288415.59	2349087.46	14.00	0.00
BUILDING			BUILDING00096	x	0		14.00	r	6288446.50	2349039.54	14.00	0.00
									6288446.15	2349025.65	14.00	0.00
									6288450.32	2349025.65	14.00	0.00
									6288450.32	2349004.82	14.00	0.00
									6288415.25	2349005.51	14.00	0.00
									6288415.94	2349040.24	14.00	0.00
BUILDING			BUILDING00097	x	0		14.00	r	6288486.08	2349026.00	14.00	0.00
									6288520.46	2349025.31	14.00	0.00
									6288519.76	2348995.79	14.00	0.00
									6288486.08	2348996.14	14.00	0.00
BUILDING			BUILDING00098	x	0		14.00	r	6288549.97	2349032.25	14.00	0.00
									6288575.66	2349019.06	14.00	0.00
									6288561.08	2348987.46	14.00	0.00
									6288534.00	2349001.69	14.00	0.00
BUILDING			BUILDING00099	x	0		14.00	r	6288585.04	2349014.54	14.00	0.00
									6288611.78	2349001.69	14.00	0.00
									6288596.84	2348969.75	14.00	0.00
									6288569.76	2348982.60	14.00	0.00
BUILDING			BUILDING00100	x	0		14.00	r	6288650.32	2348981.56	14.00	0.00
									6288635.73	2348949.96	14.00	0.00
									6288605.53	2348965.93	14.00	0.00
									6288620.11	2348996.83	14.00	0.00
BUILDING			BUILDING00101	x	0		14.00	r	6288415.59	2348995.44	14.00	0.00
									6288449.97	2348994.75	14.00	0.00
									6288450.32	2348964.54	14.00	0.00
									6288415.59	2348965.24	14.00	0.00
BUILDING			BUILDING00102	x	0		14.00	r	6288489.90	2348983.99	14.00	0.00
									6288520.46	2348984.33	14.00	0.00
									6288520.46	2348949.26	14.00	0.00
									6288486.08	2348950.31	14.00	0.00
									6288485.73	2348970.79	14.00	0.00
									6288489.55	2348971.14	14.00	0.00
BUILDING			BUILDING00103	x	0		14.00	r	6288449.62	2348954.13	14.00	0.00
									6288449.97	2348920.79	14.00	0.00
									6288414.90	2348921.14	14.00	0.00
									6288415.59	2348954.82	14.00	0.00
BUILDING			BUILDING00104	x	0		14.00	r	6288486.78	2348939.89	14.00	0.00
									6288520.11	2348940.24	14.00	0.00
									6288520.11	2348909.68	14.00	0.00
									6288485.39	2348910.03	14.00	0.00
BUILDING			BUILDING00105	x	0		14.00	r	6288550.32	2348949.96	14.00	0.00
									6288562.12	2348944.40	14.00	0.00
									6288563.16	2348948.22	14.00	0.00
									6288582.61	2348938.50	14.00	0.00
									6288567.68	2348906.90	14.00	0.00

Name	Sel.	M.	ID	RB	Residents	Absorption	Height		Coordinates			
							Begin		x	y	z	Ground
							(ft)		(ft)	(ft)	(ft)	(ft)
									6288537.12	2348922.88	14.00	0.00
BUILDING			BUILDING00106	x	0		14.00	r	6288591.64	2348933.99	14.00	0.00
									6288621.15	2348919.06	14.00	0.00
									6288607.26	2348887.81	14.00	0.00
									6288576.36	2348902.39	14.00	0.00
BUILDING			BUILDING00107	x	0		14.00	r	6288706.57	2349002.74	14.00	0.00
									6288737.47	2348987.11	14.00	0.00
									6288722.89	2348955.86	14.00	0.00
									6288695.46	2348970.10	14.00	0.00
									6288701.36	2348982.25	14.00	0.00
									6288696.84	2348984.33	14.00	0.00
BUILDING			BUILDING00108	x	0		14.00	r	6288686.08	2348960.72	14.00	0.00
									6288717.68	2348945.79	14.00	0.00
									6288703.79	2348914.54	14.00	0.00
									6288671.84	2348930.17	14.00	0.00
BUILDING			BUILDING00109	x	0		14.00	r	6288668.37	2348921.49	14.00	0.00
									6288698.93	2348905.86	14.00	0.00
									6288685.04	2348874.96	14.00	0.00
									6288656.22	2348888.15	14.00	0.00
									6288663.16	2348900.31	14.00	0.00
									6288658.65	2348903.08	14.00	0.00
BUILDING			BUILDING00110	x	0		14.00	r	6288648.93	2348880.17	14.00	0.00
									6288680.18	2348864.89	14.00	0.00
									6288667.33	2348836.42	14.00	0.00
									6288635.73	2348853.08	14.00	0.00
BUILDING			BUILDING00111	x	0		14.00	r	6288632.26	2348843.71	14.00	0.00
									6288663.86	2348827.39	14.00	0.00
									6288648.93	2348796.83	14.00	0.00
									6288621.15	2348811.42	14.00	0.00
									6288626.71	2348823.22	14.00	0.00
									6288622.54	2348825.31	14.00	0.00
BUILDING			BUILDING00112	x	0		14.00	r	6288606.22	2348782.94	14.00	0.00
									6288603.09	2348783.99	14.00	0.00
									6288612.47	2348803.43	14.00	0.00
									6288644.07	2348787.11	14.00	0.00
									6288631.57	2348760.72	14.00	0.00
									6288599.28	2348776.35	14.00	0.00

Ground Absorption(s)

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

Contour(s)

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(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)		

APPENDIX 11.1:

CADNAA CONSTRUCTION NOISE MODEL INPUTS

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15974 - East Highland

CadnaA Noise Prediction Model: 15974-02_Construction.cna
Date: 08.11.24
Analyst: B. Maddux

Calculation Configuration

Configuration	
Parameter	**Value**
General	
Max. Error (dB)	**0.00**
Max. Search Radius (#(Unit,LEN))	**2000.01**
Min. Dist Src to Rcvr	**0.00**
Partition	
Raster Factor	**0.50**
Max. Length of Section (#(Unit,LEN))	**999.99**
Min. Length of Section (#(Unit,LEN))	**1.01**
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	**100.00**
Search Radius Rcvr	**100.00**
Max. Distance Source - Rcvr	**1000.00 1000.00**
Min. Distance Rvcr - Reflector	**1.00 1.00**
Min. Distance Source - Reflector	**0.10**
Industrial (ISO 9613)	
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 (#(Unit,TEMP))	**10**
rel. Humidity (%)	**70**
Ground Absorption G	**0.50**
Wind Speed for Dir. (#(Unit,SPEED))	**3.0**
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	46.5	-53.5	43.5	0.0	0.0	0.0		x	Total	5.00	r	6291271.03	2348713.72	5.00
R2		R2	61.6	-38.4	58.5	0.0	0.0	0.0		x	Total	5.00	r	6289276.24	2349507.12	5.00
R3		R3	57.2	-42.8	54.2	0.0	0.0	0.0		x	Total	5.00	r	6288505.84	2349854.34	5.00
R4		R4	53.3	-46.7	50.3	0.0	0.0	0.0		x	Total	5.00	r	6287834.18	2349848.92	5.00

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	69.4	-30.6	-30.6	PWL-Pt	116.6					8	a

Name	ID	Height			Coordinates			
		Begin		End	x	y	z	Ground
		(ft)		(ft)	(ft)	(ft)	(ft)	(ft)
CA1	CA1	8.00	a		6288287.93	2349380.49	8.00	0.00
					6288827.49	2349424.19	8.00	0.00
					6288772.13	2349653.49	8.00	0.00
					6288869.82	2349564.39	8.00	0.00
					6288943.11	2349521.52	8.00	0.00
					6289030.41	2349487.83	8.00	0.00
					6289106.90	2349460.90	8.00	0.00
					6289177.74	2349430.83	8.00	0.00
					6289240.94	2349394.34	8.00	0.00
					6289240.66	2349192.57	8.00	0.00
					6289240.08	2348765.04	8.00	0.00
					6289216.07	2348765.03	8.00	0.00
					6289216.26	2348785.03	8.00	0.00
					6289193.51	2348785.02	8.00	0.00
					6289169.78	2348828.66	8.00	0.00
					6289044.22	2348794.94	8.00	0.00
					6288687.51	2348785.58	8.00	0.00
					6288688.92	2348755.61	8.00	0.00
					6288398.07	2348741.83	8.00	0.00
					6288405.38	2349329.91	8.00	0.00

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)

Contour(s)

Name	Sel.	M.	ID	OnlyPts	Height		Coordinates		
					Begin	End	x	y	z
					(ft)	(ft)	(ft)	(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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