Pioneertown Motel Expansion

NOISE IMPACT ANALYSIS

COUNTY OF SAN BERNARDINO

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LIST OF ABBREVIATED TERMS

(1)	Reference
ANSI	American National Standards Institute
Calveno	California Vehicle Noise
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
mph	Miles per hour
PPV	Peak Particle Velocity
Project	Pioneertown Motel Expansion
REMEL	Reference Energy Mean Emission Level
RMS	Root-mean-square
VdB	Vibration Decibels

EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine the noise exposure and the necessary noise mitigation measures for the proposed Pioneertown Motel Expansion development ("Project"). The Project site is located 5240 Curtis Road in the County of San Bernardino. The proposed Project is to include 67 additional motel rooms for a total proposed development area of 2.79 acres. This noise study has been prepared to satisfy applicable County of San Bernardino noise standards and significance criteria based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1)

SUMMARY OF CEQA SIGNIFICANCE FINDINGS

The results of this Pioneertown Motel Expansion 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. (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
On-Site Traffic Noise	5	*Less Than Significant*	-
Operational Noise	7	*Less Than Significant*	-
Construction Noise	8	*Less Than Significant*	-
Construction Vibration		*Less Than Significant*	-

1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of the proposed Pioneertown Motel Expansion ("Project"). This noise study briefly describes the proposed Project, provides information regarding noise fundamentals, sets out the local regulatory setting, presents the study methods and procedures for transportation related CNEL traffic noise analysis, and evaluates the future exterior noise environment. In addition, this study includes an analysis of the short-term construction noise and vibration impacts.

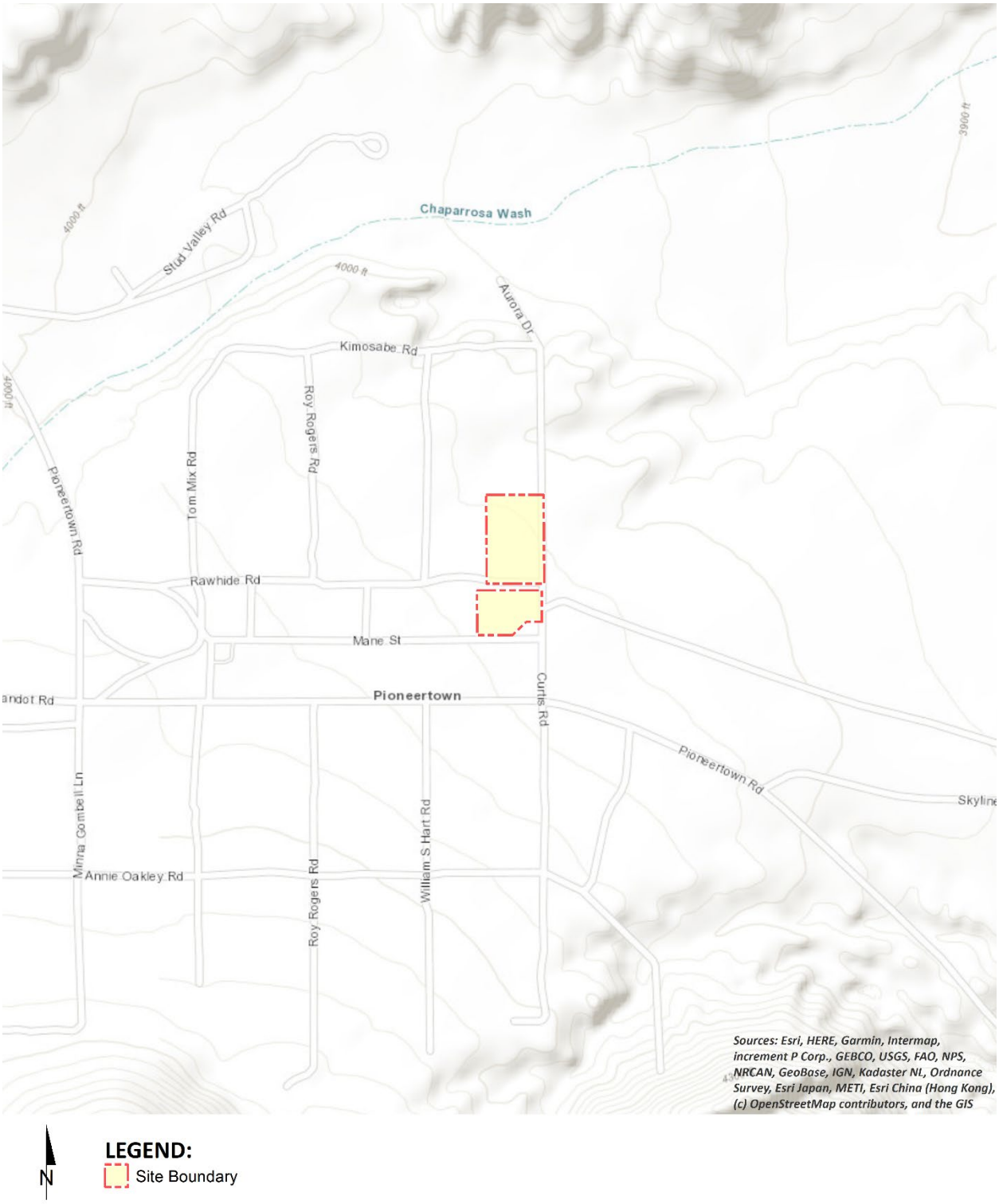
1.1 SITE LOCATION

The proposed Pioneertown Motel Expansion Project is located at 5240 Curtis Road in the County of San Bernardino, as shown on Exhibit 1-A. The area surrounding the Project Site includes residential dwellings to the north, retail shops and a restaurant located on Mane street and Pioneertown road to the south. Vacant land and residential homes are located east of the Project site with addition rural residential homes located to the west.

1.2 PROJECT DESCRIPTION

Pioneertown Motel Expansion will expand the existing use to include 67 additional motel rooms for a total proposed development area of 2.79 acres. As proposed the Pioneertown Motel will include event space, offices, an equestrian lot, a horse loafing shed, a pool and spa. The facility will be open to guests, with some portions available to the public. The facility will be staffed 24 hours a day, seven days a week. The site plan for the proposed Project is shown on Exhibit 1-B.

EXHIBIT 1-A: LOCATION MAP



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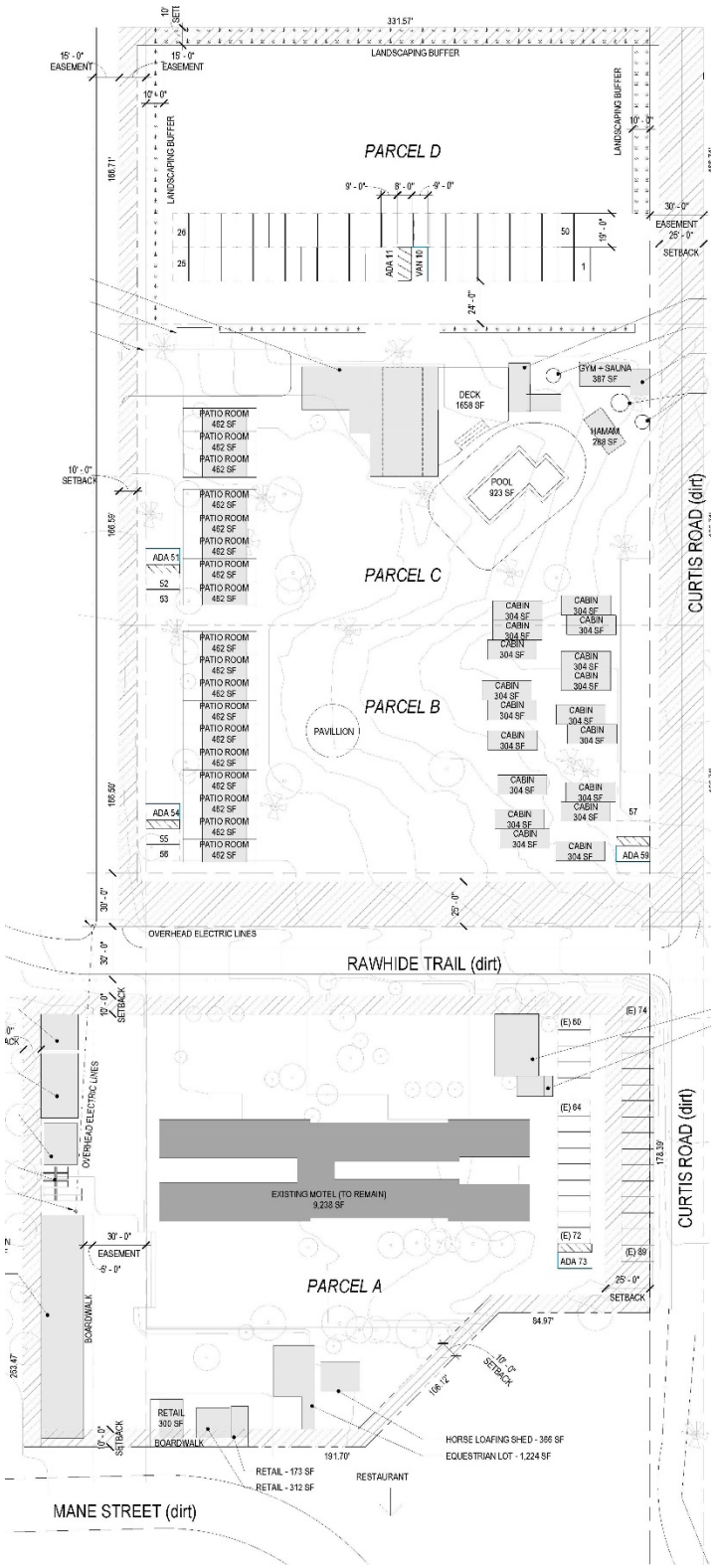
LEGEND:

Site Boundary

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

EXHIBIT 2-A: TYPICAL NOISE LEVELS

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

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

2.1 RANGE OF NOISE

Since the range of intensities that the human ear can detect is so large, the scale frequently used to measure intensity is a scale based on multiples of 10, the logarithmic scale. The scale for measuring intensity is the decibel scale. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud. (2) The most common sounds vary between 40 dBA (very quiet) to 100 dBA (very loud). Normal conversation at three feet is roughly at 60 dBA, while loud jet engine noises equate to 110 dBA

at approximately 100 feet, which can cause serious discomfort. (3) 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 figure is the equivalent level (L_{eq}). Equivalent sound levels are not measured directly but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level (L_{eq}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period and is commonly used to describe the "average" noise levels within the environment.

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

Peak hour or average noise levels, while useful, do not completely describe a given noise environment. Noise levels lower than peak hour may be disturbing if they occur during times when quiet is most desirable, namely evening and nighttime (sleeping) hours. To account for this, the Community Noise Equivalent Level (CNEL), representing a composite 24-hour noise level is utilized. The CNEL is the weighted average of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The time of day corrections require the addition of 5 decibels to dBA L_{eq} sound levels in the evening from 7:00 p.m. to 10:00 p.m., and the addition of 10 decibels to dBA L_{eq} sound levels at night between 10:00 p.m. and 7:00 a.m. These additions are made to account for the noise sensitive time periods during the evening and night hours when sound appears louder. CNEL does not represent the actual sound level heard at any time, but rather represents the total sound exposure. The County of San Bernardino 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. (2)

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. (4)

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. (2)

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.

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 be high enough and long enough to block the path of the noise source. (4)

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. (5)

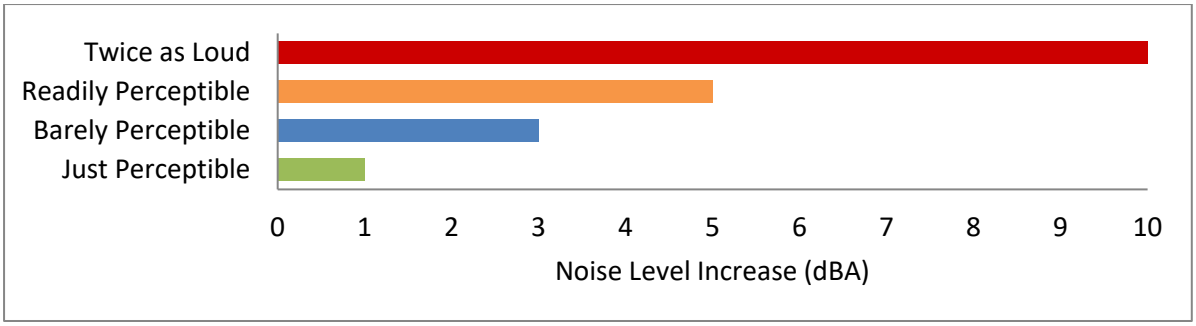
2.7 COMMUNITY RESPONSE TO NOISE

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

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

Approximately ten percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints will occur. Twenty-five percent of the population will not complain even in very severe noise environments. Thus, a variety of reactions can be expected from people exposed to any given noise environment. (6) Surveys have shown that about ten percent of the people exposed to traffic noise of 60 dBA will report being highly annoyed with the noise, and each increase of one dBA is associated with approximately two percent more people being highly annoyed. When traffic noise exceeds 60 dBA or aircraft noise exceeds 55 dBA, people may begin to complain. (6) 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 are considered *barely perceptible*, and changes of 5 dBA are considered *readily perceptible*. (4)

EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION



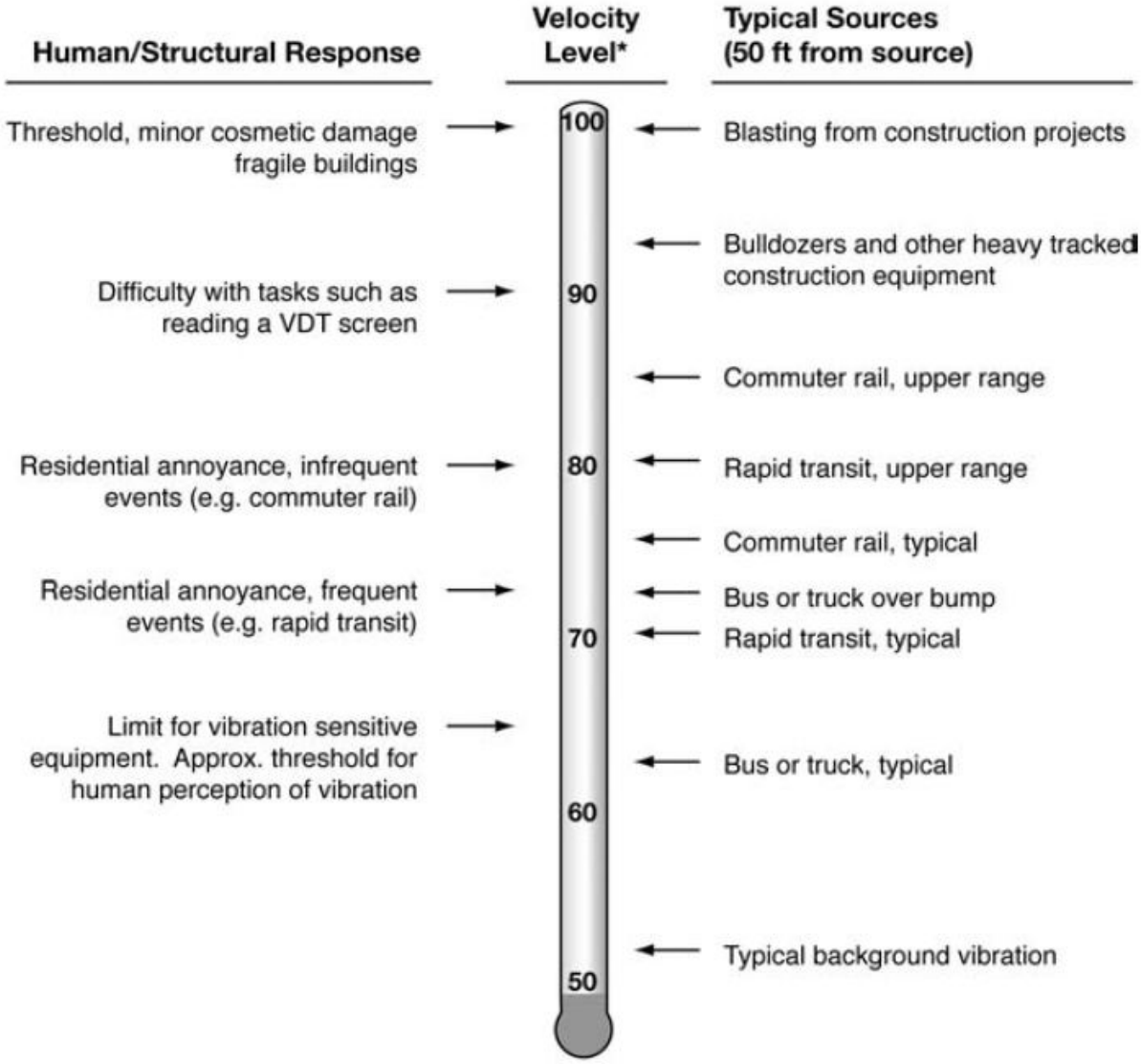
2.8 VIBRATION

Per the Federal Transit Administration (FTA) *Transit Noise Impact and Vibration Assessment* (7), vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structure-borne noise. Sources of ground-borne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, such as factory machinery, or transient, such as explosions. As is the case with airborne sound, ground-borne vibrations may be described by amplitude and frequency.

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

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

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



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

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

3 REGULATORY SETTING

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

3.1 STATE OF CALIFORNIA NOISE REQUIREMENTS

The State of California regulates freeway noise, sets standards for sound transmission, provides occupational noise control criteria, identifies noise standards, and provides guidance for local land use compatibility. State law requires that each county and city adopt a General Plan that includes a Noise Element which is to be prepared per guidelines adopted by the Governor's Office of Planning and Research (OPR). (8) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*. In addition, the California Environmental Quality Act (CEQA) requires that all known environmental effects of a project be analyzed, including environmental noise impacts.

3.2 STATE OF CALIFORNIA BUILDING CODE

The State of California's noise insulation standards are codified in the California Code of Regulations, Title 24, Building Standards Administrative Code, Part 2, and the California Building Code. These noise standards are applied to new construction in California for controlling interior noise levels resulting from exterior noise sources. The regulations specify that acoustical studies must be prepared when noise-sensitive structures, such as residential buildings, schools, or hospitals, are developed near major transportation noise sources, and where such noise sources create an exterior noise level of 60 dBA CNEL or higher. Acoustical studies that accompany building plans for noise-sensitive land uses must demonstrate that the structure has been designed to limit interior noise in habitable rooms to acceptable noise levels. For new residential buildings, schools, and hospitals, the acceptable interior noise limit for new construction is 45 dBA CNEL.

3.3 COUNTY OF SAN BERNARDINO GENERAL PLAN NOISE ELEMENT

The County of San Bernardino has adopted a Noise Element of the General Plan to limit the exposure of the community to excessive noise levels. (9) The most common sources of environmental noise in San Bernardino County are associated with roads, airports, railroad operations, and industrial activities. The facilities are used to transport residents, consumer products and provide basic infrastructure for the community. (9) To address these noise sources

found in the County of San Bernardino, the following goals have been identified in the General Plan Noise Element:

N 1 The County will abate and avoid excessive noise exposures through noise mitigation measures incorporated into the design of new noise-generating and new noise-sensitive land uses, while protecting areas within the County where the present noise environment is within acceptable limits.

N 1.5 Limit truck traffic in residential and commercial areas to designated truck routes; limit construction, delivery, and through-truck traffic to designated routes; and distribute maps of approved truck routes to County traffic officers.

N 2 The County will strive to preserve and maintain the quiet environment of mountain, desert and other rural areas.

3.4 COUNTY OF SAN BERNARDINO DEVELOPMENT CODE

While the County of San Bernardino General Plan Noise Element provides guidelines and criteria to assess transportation noise on sensitive land uses, the County Code, Title 8 Development Code contains the noise level limits for mobile, stationary, and construction-related noise sources. (10)

3.4.1 TRANSPORTATION NOISE STANDARDS

Section 83.01.080(d), Table 83-3, contains the County of San Bernardino's mobile noise source-related standards, shown on Exhibit 3-A. Based on the County's mobile noise source standards, the interior noise level standard is 45 dBA CNEL and the exterior noise level standard is 60 dBA CNEL for the commercial (hotel, motel, transient housing) land uses.

3.4.2 OPERATIONAL NOISE STANDARDS

To analyze noise impacts originating from a designated fixed location or private property such as the Pioneertown Motel Expansion, stationary-source (operational) noise such as the expected air conditioning units, parking lot vehicle movements, pool activity, outdoor activity areas, equestrian activity, special event activity, and trash enclosure activity are typically evaluated against standards established under a jurisdiction's Municipal Code. Therefore, to accurately describe the potential Project-related operational noise levels, this analysis presents the appropriate stationary-source noise level standards from the County of San Bernardino County Code, Title 8 Development Code.

The County of San Bernardino County Code, Title 8 Development Code, Section 83.01.080(c) establishes the noise level standards for stationary noise sources. Since the Project's commercial land use will potentially impact adjacent noise-sensitive uses in the Project study area, this noise study relies on the more conservative residential noise level standards to describe potential 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. (10)

EXHIBIT 3-A: COUNTY OF SAN BERNARDINO MOBILE NOISE LEVEL STANDARDS

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.

Source: County of San Bernardino County Code, Title 8 Development Code, Table 83-3.

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. The County of San Bernardino operational noise level standards are shown on Table 3-1 and included in Appendix 3.1.

TABLE 3-1: OPERATIONAL NOISE STANDARDS

Time Period	Exterior Noise Level Standards[1]					
	L_{eq} (Hourly)	L_{50} (30 mins)	L_{25} (15 mins)	L_{8} (5 mins)	L_{2} (1 min)	L_{max} (<1 min)
Daytime (7:00 a.m. to 10:00 p.m.)	55	55	60	65	70	75
Nighttime (10:00 p.m. to 7:00 a.m.)	45	45	50	55	60	65

[1] L_{eq} represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. The percent noise level is the level exceeded "n" percent of the time during the measurement period. L_{25} is the noise level exceeded 25% of the time.

[2]Source: County of San Bernardino Development Code, Title 8, Section 83.01.080 (Appendix 3.1).

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 air conditioning units, parking lot vehicle movements, pool activity, outdoor activity areas, equestrian activity, special event activity, and trash enclosure 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.

3.4.3 CONSTRUCTION NOISE STANDARDS

To analyze noise impacts originating from the construction of the Pioneertown Motel Expansion, noise from construction activities are typically limited to the hours of operation established under a jurisdiction's Municipal Code. Section 83.01.080(g)(3) of the County of San Bernardino Development Code, provided in Appendix 3.1, indicates that construction activity is considered exempt from the noise level standards between the hours of 7:00a.m. to 7:00 p.m. except on Sundays and Federal holidays. (10) In addition, neither the County of San Bernardino 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, 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. (11 p. 179)

3.4.4 CONSTRUCTION VIBRATION STANDARDS

To analyze vibration impacts originating from the operation and construction of the Pioneertown Motel Expansion, vibration-generating activities are typically evaluated against standards established under a jurisdiction's Municipal Code. Therefore, the County of San Bernardino Development Code vibration level standards are used in this analysis to assess potential impacts at nearby sensitive receiver locations. The County of San Bernardino Development Code, Section 83.01.090(a) states that vibration shall be no *greater than or equal to two-tenths inches per second measured at or beyond the lot line*. (10) Therefore, to determine if the vibration levels due to the operation and construction of the Project, the peak particle velocity (PPV) vibration level standard of 0.2 inches per second (in/sec) is used.

4 SIGNIFICANCE CRITERIA

The following significance criteria are based on currently adopted guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (12) For the purposes of this report, impacts would be potentially significant if the Project results in or causes:

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

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

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

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

4.1 CEQA GUIDELINES NOT FURTHER ANALYZED

The Project site is not located within two miles of a public airport or within an airport land use plan. The closest airport is the Los Angeles/Ontario International Airport located over 7 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 Guideline C.

4.2 NOISE-SENSITIVE RECEIVERS

Noise level increases resulting from the Project are evaluated based on the Appendix G CEQA Guidelines described above at the nearest sensitive receiver locations. Under CEQA, consideration must be given to the magnitude of the increase, the existing ambient noise levels, and the location of noise-sensitive receivers to determine if a noise level increase represents a significant adverse environmental impact. In effect, *there is no single noise increase that renders the noise impact significant.* (13) This is primarily because of the wide variation in individual thresholds of annoyance and differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted—the so-called *ambient* environment. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will typically be judged. Since neither the County of San Bernardino General Plan Noise Element or Municipal Code identify any noise level increase thresholds, the substantial noise level increase criteria are derived from the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual.*

To describe the amount to which a given noise level increase is considered acceptable, the FTA criteria is used to evaluate the incremental noise level increase and establishes a method for comparing future project noise with existing ambient conditions under CEQA Significance Threshold A. The amount to which a given noise level increase is considered acceptable is reduced based on existing ambient noise conditions.

4.3 NON-NOISE-SENSITIVE RECEIVERS

The County of San Bernardino Development Code, Section 83.01.080(d), Table 83-3 identifies transportation-related noise level standards. As previously shown on Exhibit 3-A, non-noise-sensitive land uses such as commercial and office uses, require exterior noise levels of 65 dBA CNEL per the County's Table 83-3 mobile noise source standards. To determine if Project-related traffic noise level increases are significant at off-site non-noise-sensitive land uses, a *readily perceptible* 5 dBA and *barely perceptible* 3 dBA criteria are used. When the without Project noise levels at the non-noise-sensitive land uses are below the 65 dBA CNEL exterior noise level standard, a *readily perceptible* 5 dBA or greater noise level increase is considered a significant impact. When the without Project noise levels are greater than the 65 dBA CNEL exterior noise level standard, 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 rely on the County of San Bernardino Development Code, Section 83.01.080(d), Table 83-3 exterior noise level standards.

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.

TABLE 4-1: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Receiving Land Use	Condition(s)	Significance Criteria	
			Daytime	Nighttime
Operational	Residential	Exterior Noise Level Standards	See Table 3-1.	
	Noise-Sensitive[1]	If ambient is < 50 dBA L_{eq}	≥ 7 dBA L_{eq} Project increase	
		If ambient is 50 - 55 dBA L_{eq}	≥ 5 dBA L_{eq} Project increase	
		If ambient is 55 - 60 dBA L_{eq}	≥ 3 dBA L_{eq} Project increase	
		If ambient is 60 - 65 dBA L_{eq}	≥ 2 dBA L_{eq} Project increase	
		If ambient is 65 - 75 dBA L_{eq}	≥ 1 dBA L_{eq} Project increase	
		If ambient is > 75 dBA L_{eq}	0 dBA L_{eq} Project increase	
	Non-Noise-Sensitive[2]	If ambient is < 70 dBA CNEL	≥ 5 dBA CNEL Project increase	
		If ambient is > 70 dBA CNEL	≥ 3 dBA CNEL Project increase	
Construction	Noise-Sensitive	Permitted between 7:00 a.m. to 7:00 p.m.; except Sundays and Federal holidays.[3]		
		Noise Level Threshold[1]	80 dBA L_{eq}	n/a
		Vibration Level Threshold[4]	0.2 PPV in/sec	n/a

[1] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual.
[2] Section 83.01.080(d), of the County of San Bernardino County Code Table 83-3 exterior noise level standards.
[3] Section 83.01.080(g)(3) of the County of San Bernardino County Code.
[4] Section 83.01.090(a) of the County of San Bernardino County Code.
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.; "n/a" = construction activities are not planned during the nighttime hours; "PPV" = peak particle velocity.

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5 ON-SITE TRAFFIC NOISE IMPACTS

It is expected that the primary source of noise impacts to the Project site will be traffic noise from Curtis Road and Mane Street. However, due to the distance, topography and low traffic volume/speed, traffic noise from these roads will not make a significant contribution to the Project's noise environment and no further analysis is needed. Therefore, no exterior noise mitigation is required to satisfy the County of San Bernardino General Plan Noise Element exterior land use compatibility criteria for the Project uses.

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6 SENSITIVE RECEIVER LOCATIONS

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

To describe the potential off-site Project noise levels, seven 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. 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 the existing noise sensitive Church in Pioneertown, approximately 694 feet west of the Project site.

R2: Location R2 represents the existing noise sensitive Camp Pioneertown, approximately 351 feet west of the Project site.

R3: Location R3 represents the existing noise sensitive residence at 5185 William S Hart Road, approximately 65 west of the Project site.

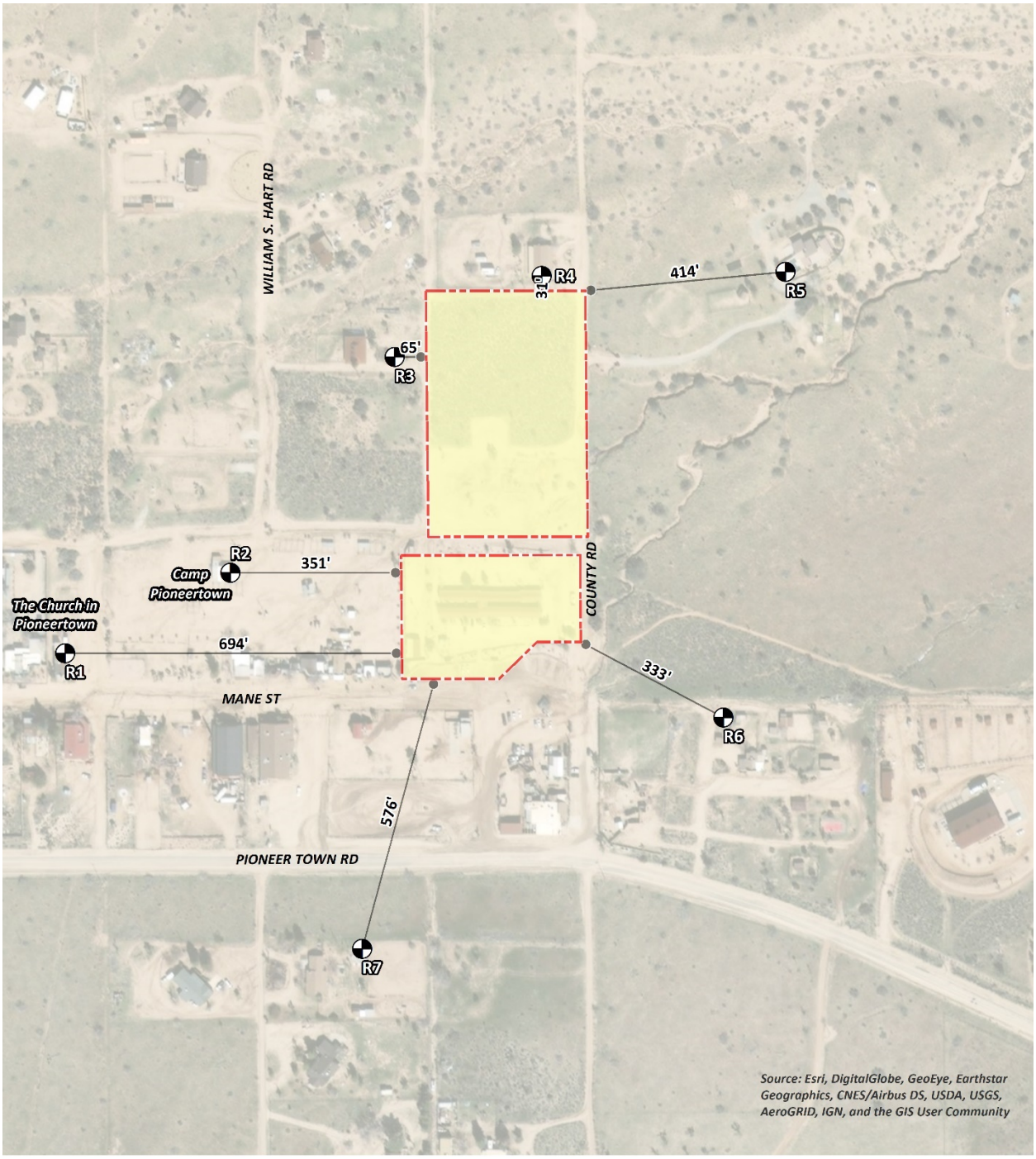
R4: Location R4 represents the existing noise sensitive residence at 5168 Curtis Road, approximately 31 feet north of the Project site.

R5: Location R5 represents the existing noise sensitive residence approximately 414 feet northeast of the Project site.

R6: Location R6 represents the existing noise sensitive Desert Willow Ranch at 53722 Pioneertown Road, approximately 333 feet southeast of the Project site.

R7: Location R7 represents the existing noise sensitive residence at 5395 William S Hart Road, approximately 576 feet southwest of the Project site.

EXHIBIT 6-A: RECEIVER LOCATIONS



7 OPERATIONAL NOISE IMPACTS

This section analyzes the potential stationary-source operational noise impacts at the nearby receiver locations, identified in Section 6, resulting from the operation of the proposed Pioneertown Motel Expansion Project. Exhibit 7-A identifies the representative noise source locations used to assess the operational noise levels.

7.1 OPERATIONAL NOISE SOURCES

This operational noise analysis is intended to describe noise level impacts associated with the expected typical daytime and nighttime motel activities at the Project site. The on-site Project-related noise sources are expected to include: air conditioning units, parking lot vehicle movements, pool activity, outdoor activity areas, equestrian activity, special event activity, and trash enclosure activity.

7.2 REFERENCE NOISE LEVELS

To estimate the Project operational noise impacts, reference noise level measurements were collected from similar types of activities to represent the noise levels expected with the development of the proposed Project. This section provides a detailed description of the reference noise level measurements shown on Table 7-1 used to estimate the Project operational noise impacts. It is important to note that the following projected noise levels assume the worst-case noise environment with the air conditioning units, parking lot vehicle movements, pool activity, outdoor activity areas, equestrian activity, special event activity, and trash enclosure activity all operating at the same time. These sources of noise activity will likely vary throughout the day.

7.2.1 MEASUREMENT PROCEDURES

The reference noise level measurements presented in this section were collected using a Larson Davis LxT Type 1 precisions sound level meter (serial number 01146). The LxT sound level meter was calibrated using a Larson-Davis calibrator, Model CAL 200, was programmed in "slow" mode to record noise levels in "A" weighted form and was located at approximately five feet above the ground elevation for each measurement. 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. (16)

TABLE 7-1: REFERENCE NOISE LEVEL MEASUREMENTS

Noise Source[1]	Noise Source Height (Feet)	Min./Hour[4]		Reference Noise Level @ 50' (dBA L_{eq})	Sound Power Level (dBA)[5]
		Day	Night		
Air Conditioning Units	4'	60'	60'	43.3	75.0
Parking Lot Vehicle Movements	5'	60'	60'	41.7	73.4
Pool Activity	5'	60'	0'	54.7	86.4
Outdoor Activity	5'	60'	0'	59.8	91.5
Equestrian Activity	8'	60'	0'	41.8	76.6
Trash Enclosure Activity	5'	10'	10'	56.8	89.0

[1] As measured by Urban Crossroads, Inc.
[2] 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.
[3] Sound power level represents the total amount of acoustical energy (noise level) produced by a sound source independent of distance or surroundings. Sound power levels calculated using the CadnaA noise model at the reference distance to the noise source. Numbers may vary due to size differences between point and area noise sources.

7.2.2 AIR CONDITIONING UNITS

To assess the noise levels created by the roof-top air conditioning units, reference noise levels were taken from the Carrier model 24ACC4 product data sheet. The product data sheet for Carrier model 24ACC4 planned for the Project will produce a maximum sound power level of 75 dBA. For this noise analysis, the air conditioning units are expected operate continuously for 60 minutes per hour and will be located four feet above the roof elevation of the Project buildings.

7.2.3 PARKING LOT VEHICLE MOVEMENTS

To determine the noise levels associated with parking lot vehicle movements, Urban Crossroads collected reference noise level measurements over a 24-hour period at the parking lot. During the peak hour of activity, parking lot vehicle movements were measured at 41.7 dBA L_{eq} at 50 feet. Noise associated with parking lot vehicle movements is expected for 60 minutes per hour during all hours.

7.2.4 POOL ACTIVITY

To represent the noise levels associated with pool activities, Urban Crossroads collected a reference noise level measurement at the Covenant Hill Clubhouse Pool in the unincorporated community of Ladera Ranch in the County of Orange. The measured reference noise level at the uniform 50-foot reference distance is 54.7 dBA L_{eq} for pool activity. The pool activity noise levels include kids playing, running, screaming, splashing, playing with a ball, and parents talking. Noise associated with pool activities is expected to occur for the entire hour (60 minutes).

7.2.5 OUTDOOR ACTIVITY

To describe the outdoor common area courtyards activity areas, a reference noise level measurement was taken at the Louie's by the Bay in Newport Beach. At 50 feet, the reference

noise level is 59.8 dBA L_{eq} at a noise source height of 5 feet. The reference noise level measurement includes outdoor eating, drinking, with patrons laughing and talking. Outdoor activities are limited to the daytime hours.

7.2.6 EQUESTRIAN ACTIVITIES

A reference noise level measurements was collected by Urban Crossroads, Inc. at the Lazy T Ranch in the census-designated place Leona Valley, within the County of Los Angeles, to represent the equestrian activities in the equestrian lot and horse loafing shed on the Project site. The reference noise level measurement represents equestrian activities observed over a 16 second period at a trail adjacent to the Lazy T Ranch. The noise sources included in the reference noise level measurement consist of a single horse pass-by event with rider and an instructor walking next to the horse and talking with the rider. At 50 feet from the source, a reference noise level of 41.8 dBA L_{eq} was measured.

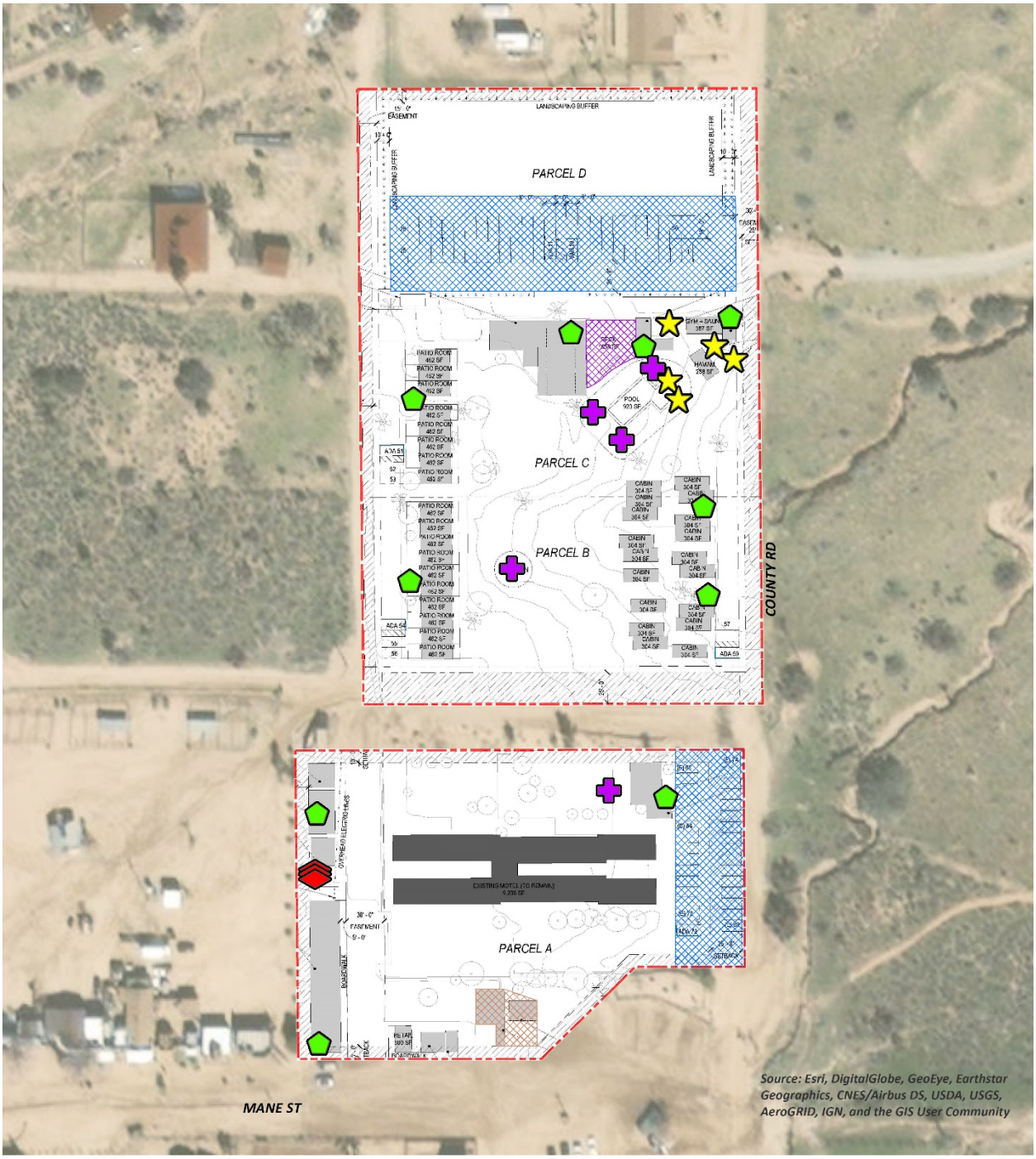
7.2.7 SPECIAL EVENTS ACTIVITY

To represent the noise levels associated with event activities, Urban Crossroads collected a reference noise level measurement at the Lake Oak Meadows wedding facility in the County of Riverside. The reference noise levels represent noise activity associated with wedding and includes, DJ speaker over the sound system, music, cheering, group conversations and other related noise. At 50 feet from the source, a reference noise level of 61.1 dBA L_{eq} was measured.

7.2.8 TRASH ENCLOSURE ACTIVITY

To describe the noise levels associated with a trash enclosure activity, Urban Crossroads collected a reference noise level measurement at an existing trash enclosure containing two dumpster bins. The trash enclosure noise levels describe metal gates opening and closing, metal scraping against concrete floor sounds, dumpster movement on metal wheels, trash dropping into the metal dumpster. At a uniform reference distance of 50 feet, trash enclosure activity produces a reference noise level of 56.8 dBA L_{eq}.

EXHIBIT 7-A: OPERATIONAL NOISE SOURCE LOCATIONS



7.3 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 protocol, CadnaA will calculate the distance from each noise source to the noise receiver locations, using the ground absorption, distance, and barrier/building attenuation inputs to provide a summary of noise level at each receiver and the partial noise level contributions by noise source. Consistent with the ISO 9613 protocol, the CadnaA noise prediction model relies on the reference sound power level (PWL) 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 (PWL) are connected to the sound source and are independent of distance. Sound pressure levels vary substantially with distance from the source and diminish from 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 0.0 was used in the CadnaA noise analysis to account for hard site conditions. Appendix 7.1 includes the detailed noise model inputs.

7.4 PROJECT OPERATIONAL NOISE LEVELS

Using the reference noise levels to represent the proposed Project operations that include air conditioning units, parking lot vehicle movements, pool activity, outdoor activity areas, equestrian activity, special event activity, and trash enclosure 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. Tables 7-2 shows the Project operational noise levels during the daytime hours of 7:00 a.m. to 10:00 p.m. The daytime hourly noise levels at the off-site receiver locations are expected to range from 39.1 to 53.1 dBA L_{eq}.

TABLE 7-2: DAYTIME PROJECT OPERATIONAL NOISE LEVELS

Noise Source[1]	Operational Noise Levels by Receiver Location (dBA Leq)						
	R1	R2	R3	R4	R5	R6	R7
Air Conditioning Units	27.2	32.0	36.8	35.1	30.2	30.4	25.3
Parking Lot Vehicle Movements	16.7	19.7	31.2	31.6	24.4	25.4	19.2
Pool Activity	29.0	31.5	36.7	44.0	41.2	40.7	25.4
Outdoor Activity	36.9	40.5	43.5	48.5	42.6	43.6	36.8
Equestrian Activity	16.1	18.9	16.5	15.7	15.4	26.2	24.5
Special Events Activity	22.7	25.4	41.2	50.2	37.5	35.5	31.9
Trash Enclosure Activity	33.5	38.2	25.6	14.0	11.3	31.5	28.6
Total (All Noise Sources)	**39.4**	**43.3**	**46.7**	**53.1**	**45.8**	**46.2**	**39.1**

[1] See Exhibit 7-A for the noise source locations. CadnaA noise model calculations are included in Appendix 7.1.

Table 7-3 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 29.6 to 38.2 dBA Leq. The differences between the daytime and nighttime noise levels is largely related to the duration of noise activity (Table 7-1).

TABLE 7-3: NIGHTTIME PROJECT OPERATIONAL NOISE LEVELS

Noise Source[1]	Operational Noise Levels by Receiver Location (dBA Leq)						
	R1	R2	R3	R4	R5	R6	R7
Air Conditioning Units	26.3	31.0	35.8	34.1	29.3	29.4	24.3
Parking Lot Vehicle Movements	15.7	18.7	30.2	30.6	23.4	24.4	18.2
Pool Activity	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Outdoor Activity	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equestrian Activity	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Special Events Activity	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trash Enclosure Activity	32.5	37.2	24.7	13.0	10.4	30.5	27.6
Total (All Noise Sources)	**33.5**	**38.2**	**37.1**	**35.7**	**30.4**	**33.6**	**29.6**

[1] See Exhibit 7-A for the noise source locations. CadnaA noise model calculations are included in Appendix 7.1.

7.5 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 County of San Bernardino exterior noise level standards at nearby noise-sensitive receiver locations. Table 7-4 shows the operational noise levels associated with Pioneertown Motel Expansion Project will satisfy the County of San Bernardino 55 dBA L_{eq} daytime and 45 dBA L_{eq} nighttime exterior noise level standards at all nearby receiver locations. Therefore, the operational noise impacts are considered *less than significant* at the nearby noise-sensitive receiver locations.

TABLE 7-4: OPERATIONAL NOISE LEVEL COMPLIANCE

Receiver Location[1]	Use	Project Operational Noise Levels (dBA Leq)[2]		Noise Level Standards (dBA Leq)[3]		Noise Level Standards Exceeded?[4]	
		Daytime	Nighttime	Daytime	Nighttime	Daytime	Nighttime
R1	Church	39.4	33.5	55.0	45.0	No	No
R2	Camp	43.3	38.2	55.0	45.0	No	No
R3	Residential	46.7	37.1	55.0	45.0	No	No
R4	Residential	53.1	35.7	55.0	45.0	No	No
R5	Residential	45.8	30.4	55.0	45.0	No	No
R6	Ranch	46.2	33.6	55.0	45.0	No	No
R7	Residential	39.1	29.6	55.0	45.0	No	No

[1] See Exhibit 6-A for the receiver locations.
[2] Proposed Project operational noise levels as shown on Tables 7-2 and 7-3.
[3] Exterior noise level standards adjusted to reflect the ambient noise levels per the County of San Bernardino Development Code, Title 8, Section 83.01.080 (Appendix 3.1).
[4] Do the estimated Project operational noise source activities exceed the noise level standards?
"Daytime" = 7:00 a.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

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8 CONSTRUCTION IMPACTS

This section analyzes potential impacts resulting from the short-term construction activities associated with the development of the Project. Exhibit 8-A shows the construction noise source locations in relation to the nearest sensitive receiver locations previously described in Section 7. To prevent high levels of construction noise from impacting noise-sensitive land uses, County of San Bernardino Development Code Section 83.01.080(g)(3), states that construction activities are limited to the hours of 7:00 a.m. to 7:00 p.m. on any day and at any time on Sundays and federal holidays.

10.1 CONSTRUCTION NOISE LEVELS

Noise generated by the Project construction equipment will include a combination of trucks, power tools, concrete mixers, and portable generators operating simultaneously 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

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

EXHIBIT 8-A: TYPICAL CONSTRUCTION NOISE SOURCE LOCATIONS

8.2 TYPICAL CONSTRUCTION REFERENCE NOISE LEVELS

To describe the Project typical construction noise levels, measurements were collected for similar activities at several construction sites. Table 8-1 provides a summary of the construction reference noise level measurements. Since the reference noise levels were collected at varying distances of 30 feet and 50 feet, all construction noise level measurements presented on Table 8-1 have been adjusted for consistency to describe a uniform reference distance of 50 feet. Construction noise generated from concrete crushing activities and nighttime concrete pours are addressed separately, below.

TABLE 8-1: TYPICAL CONSTRUCTION REFERENCE NOISE LEVELS

Construction Stage	Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})	Highest Reference Noise Level (dBA L_{eq})
Site Preparation	Scraper, Water Truck, & Dozer Activity	75.3	75.3
	Backhoe	64.2	
	Water Truck Pass-By & Backup Alarm	71.9	
Grading	Rough Grading Activities	73.5	73.5
	Water Truck Pass-By & Backup Alarm	71.9	
	Construction Vehicle Maintenance Activities	67.5	
Building Construction	Foundation Trenching	68.2	71.6
	Framing	62.3	
	Concrete Mixer Backup Alarms & Air Brakes	71.6	
Paving	Concrete Mixer Truck Movements	71.2	71.2
	Concrete Paver Activities	65.6	
	Concrete Mixer Pour & Paving Activities	65.9	
Architectural Coating	Air Compressors	65.2	65.2
	Generator	64.9	
	Crane	62.3	

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.

8.3 TYPICAL CONSTRUCTION NOISE ANALYSIS

Using the reference construction equipment noise levels and the CadnaA noise prediction model, calculations of the Project construction noise level impacts with multiple pieces of equipment operating simultaneously at the nearest sensitive receiver locations were completed. This includes the additional noise attenuation provided by the existing intervening building structures and noise barriers located between the Project site and the nearest receiver locations.

To assess the worst-case construction noise levels, the Project construction noise analysis relies on the highest noise level impacts when the equipment with the highest reference noise level is operating at the closest point from the edge of primary construction activity (Project site

boundary) to each receiver location. As shown on Table 8-2, the construction noise levels are expected to range from 52.7 to 74.2 dBA L_{eq}, and the highest construction levels are expected to range from 63.0 to 74.2 dBA L_{eq} at the nearby receiver locations. Appendix 8.1 includes the detailed CadnaA construction noise model inputs.

TABLE 8-2: TYPICAL CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})					
	Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Levels[2]
R1	62.8	61.0	59.1	58.7	52.7	68.7
R2	66.5	64.7	62.8	62.4	56.4	66.5
R3	72.8	71.0	69.1	68.7	62.7	72.8
R4	74.2	72.4	70.5	70.1	64.1	74.2
R5	65.2	63.4	61.5	61.1	55.1	66.4
R6	65.8	64.0	62.1	61.7	55.7	65.8
R7	63.0	61.2	59.3	58.9	52.9	63.0

[1] Noise receiver locations are shown on Exhibit 10-A.
[2] Construction noise level calculations based on distance from the project site boundaries (construction activity area) to nearby receiver locations. CadnaA construction noise model inputs are included in Appendix 10.1.

8.4 TYPICAL CONSTRUCTION NOISE LEVEL COMPLIANCE

To evaluate whether the Project will generate potentially significant short-term noise levels at nearest receiver locations, a construction-related daytime noise level threshold of 80 dBA L_{eq} is used as a reasonable threshold to assess the daytime construction noise level impacts. The construction noise analysis shows that the nearest receiver locations will satisfy the reasonable daytime 80 dBA L_{eq} significance threshold during Project construction activities as shown on Table 8-3. Therefore, the noise impacts due to Project construction noise is considered *less than significant* at all receiver locations.

TABLE 8-3: TYPICAL CONSTRUCTION NOISE LEVEL COMPLIANCE

Receiver Location[1]	Construction Noise Levels (dBA L_{eq})		
	Highest Construction Noise Levels[2]	Threshold[3]	Threshold Exceeded?[4]
R1	68.7	80	No
R2	66.5	80	No
R3	72.8	80	No
R4	74.2	80	No
R5	66.4	80	No
R6	65.8	80	No
R7	63.0	80	No

[1] Noise receiver locations are shown on Exhibit 8-A.
[2] Highest construction noise level calculations based on distance from the construction noise source activity to nearby receiver locations as shown on Table 8-2.
[3] Federal Transit Administration, Transit Noise and Vibration Impact Assessment Manual.
[4] Do the estimated Project construction noise levels exceed the construction noise level threshold?

8.6 TYPICAL CONSTRUCTION VIBRATION IMPACTS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from Project construction activities would cause only intermittent, localized intrusion. Ground-borne vibration levels resulting from typical construction activities occurring within the Project site were estimated by data published by the Federal Transit Administration (FTA). (11) However, while vehicular traffic is rarely perceptible, construction has the potential to result in varying degrees of temporary ground vibration, depending on the specific construction activities and equipment used.

Ground vibration levels associated with various types of construction equipment are summarized on Table 8-4. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the potential Project construction vibration levels using the following vibration assessment methods defined by the FTA. To describe the human response (annoyance) associated with vibration impacts the FTA provides the following equation:
$PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$

TABLE 8-4: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

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

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

Table 8-5 presents the expected typical construction equipment vibration levels at the nearest receiver locations. At distances ranging from 31 feet to 694 feet from typical Project construction activities (at the Project site boundary), construction vibration velocity levels are estimated at 0.064 PPV (in/sec). Based on the County of San Bernardino vibration standards, the unmitigated Project construction vibration levels will satisfy the 0.2 PPV (in/sec) threshold at all the nearby sensitive receiver locations. Therefore, the vibration impacts due to Project construction are considered *less than significant*.

Further, vibration levels at the site of the closest sensitive receiver are unlikely to be sustained during the entire construction period but will occur rather only during the times that heavy construction equipment is operating simultaneously adjacent to the Project site perimeter. Moreover, construction at the Project site will be restricted to daytime hours consistent with City requirements thereby eliminating potential vibration impacts during the sensitive nighttime hours.

TABLE 8-5: TYPICAL CONSTRUCTION EQUIPMENT VIBRATION LEVELS

Receiver[1]	Distance to Const. Activity (Feet)	Receiver PPV Levels (in/sec)[2]					Threshold PPV (in/sec)[3]	Threshold Exceeded?[4]
		Small Bulldozer	Jack-hammer	Loaded Trucks	Large Bulldozer	Peak Vibration		
R1	694'	0.000	0.000	0.001	0.001	0.001	0.2	No
R2	351'	0.000	0.001	0.001	0.002	0.002	0.2	No
R3	65'	0.001	0.008	0.018	0.021	0.021	0.2	No
R4	31'	0.002	0.025	0.055	0.064	0.064	0.2	No
R5	414'	0.000	0.001	0.001	0.001	0.001	0.2	No
R6	333'	0.000	0.001	0.002	0.002	0.002	0.2	No
R7	576'	0.000	0.000	0.001	0.001	0.001	0.2	No

[1] Receiver locations are shown on Exhibit 8-A.
[2] Based on the Vibration Source Levels of Construction Equipment included on Table 8-4.
[3] County of San Bernardino Development Code, Section 83.01.090(a) (Appendix 3.1)
[4] Does the vibration level exceed the maximum acceptable vibration threshold?

9 REFERENCES

1. **State of California.** *California Environmental Quality Act, Appendix G.* 2018.
2. **California Department of Transportation Environmental Program.** *Technical Noise Supplement - A Technical Supplement to the Traffic Noise Analysis Protocol.* Sacramento, CA : s.n., September 2013.
3. **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.* March 1974. EPA/ONAC 550/9/74-004.
4. **U.S. Department of Transportation, Federal Highway Administration, Office of Environment and Planning, Noise and Air Quality Branch.** *Highway Traffic Noise Analysis and Abatement Policy and Guidance.* December 2011.
5. **U.S. Department of Transportation, Federal Highway Administration.** *Highway Traffic Noise in the United States, Problem and Response.* April 2000. p. 3.
6. **U.S. Environmental Protection Agency Office of Noise Abatement and Control.** *Noise Effects Handbook-A Desk Reference to Health and Welfare Effects of Noise.* October 1979 (revised July 1981). EPA 550/9/82/106.
7. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment.* September 2018.
8. **Office of Planning and Research.** *State of California General Plan Guidlines.* 2017.
9. **County of San Bernardino.** *General Plan Noise Element.* April 2007.
10. —. *Code of Ordinances, Title 8 Development Code, Chapter 83.01 General Performance Standards.*
11. **U.S. Department of Transportation, Federal Transit Administration.** *Transit Noise and Vibration Impact Assessment Manual.* September 2018.
12. **State of California.** *California Environmental Quality Act, Environmental Checklist Form Appendix G.* 2019.
13. **California Court of Appeal.** *King and Gardiner Farms, LLC v. County of Kern (2020) .* 45 Cal.App.5th 814, 893,
14. **County of San Bernardino.** *Transportation & Mobility Element.* May 2019.
15. **Loescher Meachem Architects.** *Pioneertown Motel Site Plan.* 2020.
16. **American National Standards Institute (ANSI).** *Specification for Sound Level Meters ANSI S1.4-2014/IEC 61672-1:2013.*
17. **City of Murrieta.** *General Plan Noise Element.* July 2011.
18. **California Department of Transportation.** *Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report.* June 1995. FHWA/CA/TL-95/23.
19. —. *Traffic Noise Analysis Protocol.* May 2011.

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10 CERTIFICATION

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

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EDUCATION

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

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

PROFESSIONAL REGISTRATIONS

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

PROFESSIONAL AFFILIATIONS

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

PROFESSIONAL CERTIFICATIONS

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

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APPENDIX 3.1:

COUNTY OF SAN BERNARDINO DEVELOPMENT CODE

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§ 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***
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)
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)

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APPENDIX 7.1:

CADNAA OPERATIONAL NOISE MODEL INPUTS

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13525 - Pioneertown Motel Expansion

CadnaA Noise Prediction Model: 13525.cna
Date: 27.07.20
Analyst: S. Shami

Calculation Configuration

Configuration	
Parameter	Value
General	
Country	(user defined)
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	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
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	0.00
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (RLS-90)	
Strictly acc. to RLS-90	
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)
RECEIVERS		R1	39.4	33.5	41.1	55.0	45.0	0.0				5.00	a	6487133.77	2364840.80	5.00
RECEIVERS		R2	43.3	38.2	45.5	55.0	45.0	0.0				5.00	a	6487474.49	2365006.82	5.00
RECEIVERS		R3	46.7	37.1	46.3	55.0	45.0	0.0				5.00	a	6487813.03	2365451.70	5.00
RECEIVERS		R4	53.1	35.8	50.7	55.0	45.0	0.0				5.00	a	6488115.76	2365618.80	5.00
RECEIVERS		R5	45.8	30.3	43.6	55.0	45.0	0.0				5.00	a	6488618.15	2365627.48	5.00
RECEIVERS		R6	46.2	33.6	44.7	55.0	45.0	0.0				5.00	a	6488490.11	2364708.43	5.00
RECEIVERS		R7	39.1	29.6	38.7	55.0	45.0	0.0				5.00	a	6487745.54	2364231.65	5.00

Point Source(s)

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			K0	Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night				X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(dB)	(ft)		(ft)	(ft)	(ft)
POINTSOURCE		TRASH01	89.0	89.0	89.0	Lw	89.0		150.00	0.00	90.00	0.0	5.00	a	6487841.61	2364944.22	5.00
POINTSOURCE		TRASH02	89.0	89.0	89.0	Lw	89.0		150.00	0.00	90.00	0.0	5.00	a	6487841.52	2364940.41	5.00
POINTSOURCE		TRASH03	89.0	89.0	89.0	Lw	89.0		150.00	0.00	90.00	0.0	5.00	a	6487841.61	2364936.11	5.00
POINTSOURCE		AC01	75.0	75.0	75.0	Lw	75.0		900.00	0.00	540.00	0.0	4.00	g	6488052.69	2365387.29	19.00
POINTSOURCE		AC02	75.0	75.0	75.0	Lw	75.0		900.00	0.00	540.00	0.0	4.00	g	6488112.62	2365375.91	19.00
POINTSOURCE		AC03	75.0	75.0	75.0	Lw	75.0		900.00	0.00	540.00	0.0	4.00	g	6488183.94	2365400.19	4.00
POINTSOURCE		AC04	75.0	75.0	75.0	Lw	75.0		900.00	0.00	540.00	0.0	4.00	g	6487922.95	2365332.66	4.00
POINTSOURCE		AC05	75.0	75.0	75.0	Lw	75.0		900.00	0.00	540.00	0.0	4.00	g	6487919.91	2365182.44	4.00
POINTSOURCE		AC06	75.0	75.0	75.0	Lw	75.0		900.00	0.00	540.00	0.0	4.00	g	6488161.94	2365243.89	4.00

Name	M.	ID	Result. PWL			Lw / Li			Operating Time			K0	Height		Coordinates		
			Day	Evening	Night	Type	Value	norm.	Day	Special	Night				X	Y	Z
			(dBA)	(dBA)	(dBA)			dB(A)	(min)	(min)	(min)	(dB)	(ft)		(ft)	(ft)	(ft)
POINTSOURCE		AC07	75.0	75.0	75.0	Lw	75.0		900.00	0.00	540.00	0.0	4.00	g	6488165.73	2365171.06	4.00
POINTSOURCE		AC08	75.0	75.0	75.0	Lw	75.0		900.00	0.00	540.00	0.0	4.00	g	6488130.83	2365004.14	4.00
POINTSOURCE		AC09	75.0	75.0	75.0	Lw	75.0		900.00	0.00	540.00	0.0	4.00	g	6487843.28	2364990.48	19.00
POINTSOURCE		AC10	75.0	75.0	75.0	Lw	75.0		900.00	0.00	540.00	0.0	4.00	g	6487844.80	2364800.80	19.00
POINTSOURCE		POOL01	86.4	86.4	86.4	Lw	86.4		900.00	0.00	0.00	0.0	5.00	a	6488133.11	2365347.84	5.00
POINTSOURCE		POOL02	86.4	86.4	86.4	Lw	86.4		900.00	0.00	0.00	0.0	5.00	a	6488141.45	2365331.90	5.00
POINTSOURCE		POOL03	86.4	86.4	86.4	Lw	86.4		900.00	0.00	0.00	0.0	5.00	a	6488186.98	2365365.29	5.00
POINTSOURCE		POOL04	86.4	86.4	86.4	Lw	86.4		900.00	0.00	0.00	0.0	5.00	a	6488171.04	2365376.67	5.00
POINTSOURCE		POOL05	86.4	86.4	86.4	Lw	86.4		900.00	0.00	0.00	0.0	5.00	a	6488133.87	2365394.88	5.00
POINTSOURCE		COURT01	91.5	91.5	91.5	Lw	91.5		900.00	0.00	0.00	0.0	5.00	a	6488004.13	2365192.30	5.00
POINTSOURCE		COURT02	91.5	91.5	91.5	Lw	91.5		900.00	0.00	0.00	0.0	5.00	a	6488094.41	2365298.52	5.00
POINTSOURCE		COURT03	91.5	91.5	91.5	Lw	91.5		900.00	0.00	0.00	0.0	5.00	a	6488070.89	2365321.28	5.00
POINTSOURCE		COURT04	91.5	91.5	91.5	Lw	91.5		900.00	0.00	0.00	0.0	5.00	a	6488120.21	2365357.70	5.00
POINTSOURCE		COURT05	91.5	91.5	91.5	Lw	91.5		900.00	0.00	0.00	0.0	5.00	a	6488083.79	2365009.45	5.00

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	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)	
AREASOURCE		HORSE01	76.6	76.6	76.6	54.0	54.0	54.0	Lw	76.6		900.00	0.00	0.00	8
AREASOURCE		PARK01	73.4	73.4	73.4	40.2	40.2	40.2	Lw	73.4		900.00	0.00	540.00	5
AREASOURCE		PARK02	73.4	73.4	73.4	43.6	43.6	43.6	Lw	73.4		900.00	0.00	540.00	5
AREASOURCE		EVENT01	94.9	94.9	94.9	72.8	72.8	72.8	Lw	94.9		900.00	0.00	0.00	5

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
AREASOURCE	8.00	a			6487990.72	2364798.55	8.00	0.00
					6487990.59	2364816.65	8.00	0.00
					6487974.18	2364816.65	8.00	0.00
					6487974.05	2364845.43	8.00	0.00
					6487998.01	2364845.30	8.00	0.00
					6488024.44	2364836.18	8.00	0.00
					6488024.83	2364798.81	8.00	0.00
AREASOURCE	5.00	a			6487903.16	2365499.58	5.00	0.00
					6488188.32	2365499.85	5.00	0.00
					6488188.84	2365421.46	5.00	0.00
					6487903.95	2365421.20	5.00	0.00
AREASOURCE	5.00	a			6488138.84	2365043.15	5.00	0.00
					6488195.06	2365043.32	5.00	0.00
					6488196.11	2364863.86	5.00	0.00
					6488138.58	2364863.83	5.00	0.00
AREASOURCE	5.00	a			6488065.02	2365397.12	5.00	0.00
					6488106.16	2365397.12	5.00	0.00
					6488106.34	2365366.66	5.00	0.00
					6488101.39	2365364.75	5.00	0.00
					6488097.40	2365362.84	5.00	0.00
					6488092.36	2365359.80	5.00	0.00
					6488088.28	2365357.28	5.00	0.00
					6488083.94	2365354.33	5.00	0.00
					6488080.73	2365351.29	5.00	0.00
					6488077.86	2365348.51	5.00	0.00
					6488073.78	2365345.65	5.00	0.00
					6488070.49	2365343.65	5.00	0.00
					6488067.01	2365342.00	5.00	0.00
					6488065.62	2365341.40	5.00	0.00

Barrier(s)

Name	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	M.	ID	RB	Residents	Absorption	Height		Coordinates			
						Begin		x	y	z	Ground
						(ft)		(ft)	(ft)	(ft)	(ft)
BUILDING		BUILDING00001	x	0		15.00	a	6488147.11	2365400.07	15.00	0.00
								6488177.06	2365400.70	15.00	0.00
								6488177.37	2365386.19	15.00	0.00
								6488148.05	2365385.56	15.00	0.00
BUILDING		BUILDING00002	x	0		15.00	a	6488177.37	2365395.65	15.00	0.00
								6488188.72	2365395.97	15.00	0.00
								6488188.72	2365380.83	15.00	0.00
								6488177.37	2365381.46	15.00	0.00
BUILDING		BUILDING00003	x	0		15.00	a	6488116.52	2365382.09	15.00	0.00
								6488137.02	2365381.78	15.00	0.00
								6488137.02	2365372.32	15.00	0.00
								6488116.84	2365372.95	15.00	0.00
BUILDING		BUILDING00004	x	0		15.00	a	6488160.51	2365374.21	15.00	0.00
								6488175.05	2365354.57	15.00	0.00
								6488164.96	2365347.74	15.00	0.00
								6488150.21	2365367.38	15.00	0.00
BUILDING		BUILDING00005	x	0		15.00	a	6488105.94	2365399.49	15.00	0.00
								6488118.73	2365399.12	15.00	0.00
								6488118.73	2365371.69	15.00	0.00
								6488106.26	2365371.72	15.00	0.00
BUILDING		BUILDING00006	x	0		15.00	a	6488138.14	2365268.16	15.00	0.00
								6488167.22	2365268.33	15.00	0.00
								6488167.31	2365257.39	15.00	0.00
								6488170.35	2365257.39	15.00	0.00
								6488170.48	2365246.20	15.00	0.00
								6488141.40	2365246.02	15.00	0.00
								6488141.48	2365257.05	15.00	0.00
								6488138.23	2365257.18	15.00	0.00
BUILDING		BUILDING00007	x	0		15.00	a	6488098.17	2365265.21	15.00	0.00
								6488126.99	2365265.21	15.00	0.00
								6488127.25	2365243.07	15.00	0.00
								6488124.16	2365243.07	15.00	0.00
								6488124.16	2365232.09	15.00	0.00
								6488095.35	2365232.09	15.00	0.00
								6488095.35	2365243.07	15.00	0.00
								6488098.34	2365243.16	15.00	0.00
BUILDING		BUILDING00008	x	0		15.00	a	6488092.39	2365220.11	15.00	0.00
								6488121.21	2365220.11	15.00	0.00
								6488121.30	2365209.30	15.00	0.00
								6488124.43	2365209.17	15.00	0.00
								6488124.51	2365198.06	15.00	0.00
								6488095.65	2365198.15	15.00	0.00
								6488095.56	2365209.13	15.00	0.00
								6488092.39	2365209.04	15.00	0.00
BUILDING		BUILDING00009	x	0		15.00	a	6488095.91	2365192.12	15.00	0.00
								6488124.86	2365192.16	15.00	0.00
								6488125.08	2365181.05	15.00	0.00
								6488095.95	2365181.05	15.00	0.00
BUILDING		BUILDING00010	x	0		15.00	a	6488135.67	2365206.74	15.00	0.00
								6488164.66	2365206.79	15.00	0.00
								6488164.75	2365195.98	15.00	0.00
								6488171.39	2365195.76	15.00	0.00
								6488171.52	2365184.82	15.00	0.00
								6488142.52	2365184.87	15.00	0.00
								6488142.35	2365195.67	15.00	0.00
								6488135.84	2365195.76	15.00	0.00
BUILDING		BUILDING00011	x	0		15.00	a	6488138.27	2365236.86	15.00	0.00
								6488167.52	2365236.91	15.00	0.00
								6488167.70	2365214.90	15.00	0.00
								6488138.57	2365214.77	15.00	0.00
BUILDING		BUILDING00012	x	0		15.00	a	6488101.92	2365167.03	15.00	0.00
								6488130.77	2365167.10	15.00	0.00
								6488130.84	2365156.10	15.00	0.00
								6488102.02	2365155.99	15.00	0.00
BUILDING		BUILDING00013	x	0		15.00	a	6488141.78	2365162.94	15.00	0.00
								6488171.09	2365163.08	15.00	0.00
								6488171.15	2365151.96	15.00	0.00
								6488168.03	2365151.96	15.00	0.00
								6488168.06	2365141.03	15.00	0.00
								6488139.25	2365140.92	15.00	0.00
								6488139.07	2365151.96	15.00	0.00
								6488141.95	2365152.07	15.00	0.00
BUILDING		BUILDING00014	x	0		15.00	a	6488100.53	2365147.76	15.00	0.00
								6488129.45	2365147.73	15.00	0.00
								6488129.56	2365136.83	15.00	0.00
								6488132.65	2365136.83	15.00	0.00
								6488132.79	2365125.75	15.00	0.00

Name	M.	ID	RB	Residents	Absorption	Height		Coordinates			
						Begin		x	y	z	Ground
						(ft)		(ft)	(ft)	(ft)	(ft)
								6488103.86	2365125.64	15.00	0.00
								6488103.69	2365136.58	15.00	0.00
								6488100.63	2365136.65	15.00	0.00
BUILDING		BUILDING00015	x	0		15.00	a	6488136.15	2365129.78	15.00	0.00
								6488165.15	2365129.81	15.00	0.00
								6488165.18	2365118.73	15.00	0.00
								6488136.36	2365118.77	15.00	0.00
BUILDING		BUILDING00016	x	0		15.00	a	6487928.33	2365247.55	15.00	0.00
								6487954.24	2365247.62	15.00	0.00
								6487955.42	2365117.62	15.00	0.00
								6487929.44	2365117.69	15.00	0.00
BUILDING		BUILDING00017	x	0		15.00	a	6487916.27	2365327.63	15.00	0.00
								6487959.39	2365327.70	15.00	0.00
								6487959.95	2365262.42	15.00	0.00
								6487916.96	2365262.49	15.00	0.00
BUILDING		BUILDING00018	x	0		15.00	a	6487927.10	2365373.33	15.00	0.00
								6487953.00	2365373.53	15.00	0.00
								6487953.28	2365334.51	15.00	0.00
								6487927.31	2365334.37	15.00	0.00
BUILDING		BUILDING00019	x	0		15.00	a	6487907.46	2364815.18	15.00	0.00
								6487921.28	2364815.18	15.00	0.00
								6487921.49	2364793.37	15.00	0.00
								6487907.53	2364793.37	15.00	0.00
BUILDING		BUILDING00020	x	0		15.00	a	6487929.06	2364793.37	15.00	0.00
								6487928.85	2364810.18	15.00	0.00
								6487948.43	2364810.25	15.00	0.00
								6487948.57	2364793.44	15.00	0.00
BUILDING		BUILDING00021	x	0		15.00	a	6487949.68	2364793.51	15.00	0.00
								6487949.34	2364811.36	15.00	0.00
								6487959.34	2364811.36	15.00	0.00
								6487959.61	2364793.44	15.00	0.00
BUILDING		BUILDING00022	x	0		15.00	a	6487837.07	2364918.55	15.00	0.00
								6487862.20	2364918.68	15.00	0.00
								6487863.37	2364792.89	15.00	0.00
								6487838.37	2364792.76	15.00	0.00
BUILDING		BUILDING00023	x	0		15.00	a	6487836.03	2365032.09	15.00	0.00
								6487857.90	2365031.70	15.00	0.00
								6487857.90	2365011.51	15.00	0.00
								6487836.29	2365011.77	15.00	0.00
BUILDING		BUILDING00024	x	0		15.00	a	6487836.03	2365009.69	15.00	0.00
								6487858.16	2365009.69	15.00	0.00
								6487858.42	2364973.36	15.00	0.00
								6487836.42	2364973.23	15.00	0.00
BUILDING		BUILDING00025	x	0		15.00	a	6487838.24	2364970.37	15.00	0.00
								6487858.29	2364970.50	15.00	0.00
								6487858.16	2364947.19	15.00	0.00
								6487838.76	2364946.93	15.00	0.00
BUILDING		BUILDING00026	x	0		15.00	a	6487905.69	2364972.84	15.00	0.00
								6487994.34	2364972.81	15.00	0.00
								6487994.27	2364971.00	15.00	0.00
								6488074.72	2364971.17	15.00	0.00
								6488074.72	2364972.86	15.00	0.00
								6488122.63	2364973.12	15.00	0.00
								6488122.89	2364952.03	15.00	0.00
								6488081.75	2364951.90	15.00	0.00
								6488081.75	2364949.42	15.00	0.00
								6488008.83	2364949.03	15.00	0.00
								6488008.83	2364939.27	15.00	0.00
								6488081.88	2364939.53	15.00	0.00
								6488081.88	2364936.66	15.00	0.00
								6488122.89	2364936.79	15.00	0.00
								6488123.29	2364915.83	15.00	0.00
								6488075.11	2364915.83	15.00	0.00
								6488075.24	2364917.26	15.00	0.00
								6487994.90	2364917.26	15.00	0.00
								6487994.90	2364915.31	15.00	0.00
								6487906.36	2364915.18	15.00	0.00
								6487905.97	2364936.92	15.00	0.00
								6487986.70	2364937.05	15.00	0.00
								6487986.57	2364951.24	15.00	0.00
								6487905.97	2364950.85	15.00	0.00
BUILDING		BUILDING00027	x	0		15.00	a	6488101.56	2365032.52	15.00	0.00
								6488127.43	2365032.69	15.00	0.00
								6488127.60	2364997.45	15.00	0.00
								6488101.91	2364997.45	15.00	0.00
BUILDING		BUILDING00028	x	0		15.00	a	6488127.60	2364997.45	15.00	0.00
								6488135.85	2364997.53	15.00	0.00

Name	M.	ID	RB	Residents	Absorption	Height		Coordinates			
						Begin		x	y	z	Ground
						(ft)		(ft)	(ft)	(ft)	(ft)
								6488136.11	2364986.16	15.00	0.00
								6488114.84	2364986.08	15.00	0.00
								6488114.76	2364997.45	15.00	0.00
BUILDING		BUILDING00029	x	0		15.00	a	6487985.33	2365396.86	15.00	0.00
								6488025.17	2365396.73	15.00	0.00
								6488025.30	2365359.36	15.00	0.00
								6488013.19	2365359.23	15.00	0.00
								6488013.06	2365372.51	15.00	0.00
								6487985.46	2365372.51	15.00	0.00
BUILDING		BUILDING00030	x	0		15.00	a	6488032.33	2365396.47	15.00	0.00
								6488055.90	2365396.47	15.00	0.00
								6488056.55	2365335.40	15.00	0.00
								6488032.99	2365335.27	15.00	0.00
BUILDING		BUILDING00031	x	0		15.00	a	6488025.17	2365396.73	15.00	0.00
								6488065.15	2365396.99	15.00	0.00
								6488065.54	2365335.14	15.00	0.00
								6488025.43	2365334.75	15.00	0.00

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APPENDIX 8.1:

CADNAA CONSTRUCTION NOISE MODEL INPUTS

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13525 - Pioneertown Motel Expansion

CadnaA Noise Prediction Model: 13525 - Construction.cna
Date: 27.07.20
Analyst: S. Shami

Calculation Configuration

Configuration	
Parameter	Value
General	
Country	(user defined)
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	
Reference Time Day (min)	960.00
Reference Time Night (min)	480.00
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	0.00
Wind Speed for Dir. (#(Unit,SPEED))	3.0
Roads (RLS-90)	
Strictly acc. to RLS-90	
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)
RECEIVERS		R1	62.8	62.8	69.5	55.0	45.0	0.0				5.00	a	6487133.77	2364840.80	5.00
RECEIVERS		R2	66.5	66.5	73.1	55.0	45.0	0.0				5.00	a	6487474.49	2365006.82	5.00
RECEIVERS		R3	72.8	72.8	79.4	55.0	45.0	0.0				5.00	a	6487813.03	2365451.70	5.00
RECEIVERS		R4	74.2	74.2	80.9	55.0	45.0	0.0				5.00	a	6488115.76	2365618.80	5.00
RECEIVERS		R5	65.2	65.2	71.9	55.0	45.0	0.0				5.00	a	6488618.15	2365627.48	5.00
RECEIVERS		R6	65.8	65.8	72.5	55.0	45.0	0.0				5.00	a	6488490.11	2364708.43	5.00
RECEIVERS		R7	63.0	63.0	69.7	55.0	45.0	0.0				5.00	a	6487745.54	2364231.65	5.00

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)	
SITEBOUNDARY		SITEBOUNDARY00001	117.2	117.2	117.2	75.3	75.3	75.3	Lw"	75.3					8
SITEBOUNDARY		SITEBOUNDARY00002	114.2	114.2	114.2	75.3	75.3	75.3	Lw"	75.3					8

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
SITEBOUNDARY	8.00	a			6487876.49	2365587.78	8.00	0.00
					6488205.57	2365588.48	8.00	0.00
					6488210.60	2365080.93	8.00	0.00

Name	Height				Coordinates			
	Begin		End		x	y	z	Ground
	(ft)		(ft)		(ft)	(ft)	(ft)	(ft)
					6487881.61	2365080.23	8.00	0.00
SITEBOUNDARY	8.00	a			6487825.30	2365042.21	8.00	0.00
					6488195.06	2365043.32	8.00	0.00
					6488196.11	2364863.86	8.00	0.00
					6488105.68	2364863.82	8.00	0.00
					6488027.77	2364787.87	8.00	0.00
					6487827.90	2364787.87	8.00	0.00