4.5 NOISE

4.5.1 INTRODUCTION

This section analyzes potential noise impacts associated with the development of the Sunset Ridge Park Project. This section provides background information on noise and community noise assessment criteria; presents existing noise levels in the Project area; and examines noise impacts that could potentially occur during construction and operation of the proposed Project.

4.5.2 NOISE CRITERIA AND DEFINITIONS

Sound is a vibratory disturbance created by a moving or vibrating source and that is capable of being detected by the hearing organs. Noise is defined as sound that is loud, unpleasant, unexpected, or undesired and may therefore be classified as a more specific group of sounds. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance and, in the extreme, hearing impairment.

Decibels and Frequency

In its most basic form, a continuous sound can be described by its frequency or wavelength (pitch) and its amplitude (loudness). Sound pressure levels are described in units called the decibel (dB). Decibels are measured on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used for earthquake magnitudes. Therefore, a doubling of the energy of a noise source, such as doubling of traffic volume, would increase the noise level by 3 dB; a halving of the energy would result in a 3 dB decrease.

Groundborne vibration consists of oscillatory waves that propagate from the source through the ground to adjacent structures. The frequency of a vibrating object describes how rapidly it is oscillating. The number of cycles per second of oscillation is the vibration frequency, which is described in terms of hertz (Hz). The normal frequency range of most groundborne vibration that can be felt generally starts from a low frequency of less than 1 Hz to a high of about 200 Hz.

Perception of Noise and Vibration

Noise

The human ear is not equally sensitive to all frequencies within the sound spectrum. To accommodate this phenomenon, the A-scale, which approximates the frequency response of the average young ear when listening to most ordinary everyday sounds, was devised. When people make relative judgments of the loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Therefore, the “A-weighted” noise scale is used for measurements and standards involving the human perception of noise. Noise levels using A-weighted measurements are written dB(A) or dBA.

Human perception of noise has no simple correlation with acoustical energy. The perception of noise is not linear in terms of dBA or in terms of acoustical energy. Two noise sources do not “sound twice as loud” as one source. It is widely accepted that the average healthy ear can barely perceive changes of a 3 dBA increase or decrease; that a change of 5 dBA is readily perceptible; and that an increase or decrease of 10 dBA sounds twice or half as loud, respectively.

As noise travels from the source to the receiver, noise changes both in level and frequency spectrum. The most obvious change is the decrease in noise as the distance from the source increases. The manner in which noise reduces with distance (noise attenuation) depends on a number of factors. Ground absorption, atmospheric effects, and shielding (as by natural and man-made barriers) also affect the rate of noise attenuation.

Vibration

While people have varying sensitivities to vibrations at different frequencies, in general they are most sensitive to low-frequency vibration. Vibration in buildings caused by construction activities may be perceived as motion of building surfaces or rattling of windows, items on shelves, and pictures hanging on walls. Vibration of building components can also take the form of an audible low-frequency rumbling noise, which is referred to as groundborne noise. Groundborne noise is usually only a problem when the originating vibration spectrum is dominated by frequencies in the upper end of the range (60 to 200 Hz), or when the structure and the construction activity are connected by foundations or utilities, such as sewer and water pipes.

Although groundborne vibration is sometimes noticeable in outdoor environments, groundborne vibration is almost never annoying to people who are outdoors. The primary concern from vibration is the ability to be intrusive and annoying to nearby residents and other vibration-sensitive land uses. Vibration energy spreads out as it travels through the ground, causing the vibration level to diminish with distance away from the source. High frequency vibrations reduce much more rapidly than low frequencies, so that low frequencies tend to dominate the spectrum at greater distances from the source.

Noise and Vibration Metrics

Several rating scales (or noise "metrics") exist to analyze effects of noise on a community. These scales include the equivalent noise level (L_{eq}), the community noise equivalent level (CNEL), and the day-night average sound level (L_{dn}). Average noise levels over a period of minutes or hours are usually expressed as dBA L_{eq}, which is the equivalent noise level for that period of time. The period of time averaging may be specified; for example, $L_{eq(3)}$ would be a three-hour average. When no period is specified, a one-hour average is assumed. It is important to understand that noise of short duration (i.e., a time period substantially less than the averaging period) is averaged into ambient noise during the period of interest. Therefore, a loud noise lasting many seconds or a few minutes may have minimal effect on the measured sound level averaged over a one-hour period.

To evaluate community noise impacts, a descriptor was developed that accounts for human sensitivity to nighttime noise. The descriptor is called the L_{dn}, which represents the 24-hour average sound level with a penalty for noise occurring at night. The L_{dn} computation divides the 24-hour day into two periods: daytime (7:00 AM to 10:00 PM), and nighttime (10:00 PM to 7:00 AM). The nighttime sound levels are assigned a 10 dBA penalty prior to averaging with daytime hourly sound levels. CNEL is similar to L_{dn} except that it separates a 24-hour day into three periods: daytime (7:00 AM to 7:00 PM), evening (7:00 PM to 10:00 PM), and nighttime (10:00 PM to 7:00 AM). The evening and nighttime sound levels are assigned a 5 and 10 dBA penalty respectively, prior to averaging with daytime hourly sound levels. Several statistical descriptors are also often used to describe noise, including L_{max}, L_{min}, and L_x. L_{max} and L_{min} are respectively the highest and lowest A-weighted sound levels that occur during a noise event. The L_x signifies the noise level that is exceeded x percent of the time; for example, L10 denotes the level that was exceeded 10 percent of the time.

Vibration levels are usually expressed as single-number measure of vibration magnitude, in terms of velocity or acceleration, which describes the severity of the vibration without the frequency variable. The peak particle velocity (ppv) is defined as the maximum instantaneous positive or negative peak of the vibration signal, usually measured in inches per second (in/sec). Since it is related to the stresses that are experienced by buildings, ppv is generally used to assess vibration to structures.

4.5.3 REGULATORY SETTING

Public agencies have established noise guidelines and standards to protect citizens from potential hearing damage and various other adverse physiological and social effects associated with noise.

State

Title 24 of the *California Code of Regulations* (California Building Standards Code) requires that residential structures, other than detached single-family dwellings, be designed to prevent the intrusion of exterior noise so that the interior CNEL with windows closed, attributable to exterior sources, shall not exceed 45 dBA in any habitable room.

City of Newport Beach

The *City of Newport Beach General Plan's* Noise Element is the guiding document for the City's noise policy and is designed to protect residents and businesses from excessive and persistent noise intrusions. Applicable goals and policies are identified in Table 4.1-2 in Section 4.1, Land Use and Related Planning Programs, with a Project consistency analysis. Tables 4.1-3 and 4.1-4 address the Project's consistency with applicable policies of the City's Coastal Land Use Program and the California Coastal Act, respectively.

For the purpose of this noise analysis, noise from traffic on West Coast Highway and Superior Avenue to the recreational areas of the proposed Project are governed by the standards and policies included in the City's Noise Element. The Noise Element includes the noise compatibility guidelines shown in Table 4.5-1, which are derived from the State General Plan Guidelines. The City's Noise Compatibility guidelines should be incorporated into land use planning to reduce future noise and land use incompatibilities. These guidelines are primarily used to assess transportation noise impacts to new developments. For parks, an ambient noise level of up to 65 dBA CNEL is considered "clearly compatible", and levels between 65 and 70 dBA CNEL are considered "normally compatible". Under "clearly compatible" conditions, the specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements. Under "normally compatible" conditions, new construction or development should be undertaken only after detailed analysis of the noise reduction requirements are made and needed noise insulation features in the design are determined.

TABLE 4.5-1
CITY OF NEWPORT BEACH LAND USE COMPATIBILITY GUIDELINES

Land Use Categories		CNEL Zone						
Categories	**Uses**	**<55**	**55–60**	**60–65**	**65–70**	**70–75**	**75–80**	**>80**
Residential	Single Family, Two Family, Multiple Family	A	A	B	C	C	D	D
Residential	Mixed Use	A	A	A	C	C	C	D
Residential	Mobile Home	A	A	B	C	C	D	D
Commercial Regional, District	Hotel, Motel, Transient Lodging	A	A	B	B	C	C	D
Commercial Regional, Village District, Special	Commercial Retail, Bank, Restaurant, Movie Theater	A	A	A	A	B	B	C
Commercial Industrial Institutional	Office Building, Research and Development, Professional Office, City Office Building	A	A	A	B	B	C	D
Commercial Recreational **Institutional** Civic Center	Amphitheatre, Concert Hall Auditorium, Meeting Hall	B	B	C	C	D	D	D
Commercial Recreational	Children's Amusement Park, Miniature Golf Course, Go-cart Track, Equestrian Center, Sports Club	A	A	A	B	B	D	D
Commercial General, Special **Industrial, Institutional**	Automobile Service Station, Auto Dealership, Manufacturing, Warehousing, Wholesale, Utilities	A	A	A	A	B	B	B
Institutional	Hospital, Church, Library, Schools' Classroom	A	A	B	C	C	D	D
Open Space	Parks	A	A	A	B	C	D	D
Open Space	Golf Course, Cemeteries, Nature Centers, Wildlife Reserves, Wildlife Habitat	A	A	A	A	B	C	C
Agriculture	Agriculture	A	A	A	A	A	A	A

Zone A: Clearly Compatible—Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction without any special noise insulation requirements.
Zone B: Normally Compatible—New construction or development should be undertaken only after detailed analysis of the noise reduction requirements and are made and needed noise insulation features in the design are determined. Conventional construction, with closed windows and fresh air supply systems or air conditioning, will normally suffice.
Zone C: Normally Incompatible—New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of noise reduction requirements must be made and needed noise insulation features included in the design.
Zone D: Clearly Incompatible—New construction or development should generally not be undertaken.

Source: Newport Beach 2006.

The following discussion provides a summary of the City of Newport Beach Noise Element goals and policies applicable to the project.

Goal N1-Noise Compatibility, is focused on minimizing land use conflicts between various noise sources. Two policies are applicable to the proposed Project: Policy N1.1, Noise Compatibility of New Development, requires that all proposed projects are compatible with the noise environment through use of the noise compatibility matrix presented in Table 4.5-1 and that exterior noise standards are enforced. Policy N1.8, Significant Noise Impacts, requires the employment of noise mitigation measures for existing sensitive uses when a significant noise impact is identified for new development impacting existing sensitive uses, as presented in Table 4.5-2.

TABLE 4.5-2
SIGNIFICANT NOISE IMPACT CRITERIA FOR
NEW DEVELOPMENT AFFECTING EXISTING SENSITIVE LAND USES

CNEL (dBA)	dBA Increase
55	3
60	2
65	1
70	1
Over 75	Any increase is considered significant
Source: Newport Beach 2006.	

Goal N4-Minimization of Non-transportation-Related Noise, is focused on minimizing noise impacts on sensitive noise receptors. Policy N4.1, Stationary Noise Sources, enforces interior and exterior noise standards outlined in the City's Noise Ordinance. Policy N4.4, Limiting Hours of Recreational Activities, limits hours when recreational activities in parks and the harbor can take place. This goal is implemented by the City of Newport Beach Municipal Code Section 11.04.040; no person shall enter or remain upon any park facility between the hours of 11:00 PM. and 6:00 AM.

Goal N5-minimized *(sic)* excessive construction-related noise. Policy N5.1, Limiting Hours of Activity, promotes enforcing the limits on hours of construction activity, as discussed below.

City of Newport Beach Municipal Code

The Noise Ordinance is designed to control unnecessary, excessive, and annoying sounds from sources on private property by setting limits that cannot be exceeded at adjacent properties. The Noise Ordinance requirements are not applicable to mobile noise sources such as heavy trucks when traveling on public roadways. Control of the mobile noise sources on public roads is preempted by federal and State laws. However, the Noise Ordinance does apply to vehicles while they are on private property.

Section 10.26.025 of the Noise Ordinance specifies exterior noise levels that cannot be exceeded for a specified period of time at specified noise zones. The City-adopted exterior and interior noise level limits are presented in Table 4.5-3.

TABLE 4.5-3
CITY OF NEWPORT EACH NOISE ORDINANCE STANDARDS

Zone		Noise Metric	Allowable Noise Level	
			7 AM to 10 PM (daytime)	10 PM to 7 AM (nighttime)
Exterior Noise Standards				
I	Residential: Single-family, two- or multiple-family	L_{eq} (15 min)	55 dBA	50 dBA
		L_{max}	75 dBA	70 dBA
II	Commercial	L_{eq} (15 min)	65 dBA	60 dBA
		L_{max}	85 dBA	80 dBA
III	Residential Portions of Mixed-Use Properties[a]	L_{eq} (15 min)	60 dBA	50 dBA
		L_{max}	80 dBA	70 dBA
IV	Industrial and Manufacturing	L_{eq} (15 min)	70 dBA	70 dBA
		L_{max}	90 dBA	90 dBA
Interior Noise Standards				
I	Residential	L_{eq} (15 min)	45 dBA	40 dBA
		L_{max}	65 dBA	60 dBA
III	Residential Portions of Mixed-Use Properties[a]	L_{eq} (15 min)	45 dBA	45 dBA
		L_{max}	65 dBA	65 dBA

[a] Residential uses within 100 feet of a commercial property where noise is from said commercial property.
Source: City of Newport Beach Noise Ordinance

If the ambient noise level exceeds the standards shown in Table 4.5-3, the ambient noise shall be the standard. These standards should not be exceeded for a cumulative period of more than 15 minutes in any hour; or the noise standard plus 20 dBA for any period of time. If the measurement location is on the boundary between two different noise zones, the lower noise level standard applicable to the noise zone should apply.

Construction Noise

Section 10.26.035D of the City's Noise Ordinance exempts noise sources associated with construction, repair, remodeling, demolition, or grading of any real property from the City's Noise Ordinance standards shown in Table 4.5-3. These activities are subject to the provisions of Chapter 10.28, which prohibits construction activities that generates loud noise that disturbs, or could disturb, a person of normal sensitivity who works or resides in the vicinity except during weekdays between the hours of 7:00 AM to 6:30 PM, and Saturdays between the hours of 8:00 AM to 6:00 PM.

Vibration Standards

The City does not have regulatory standards for construction or operational vibration sources. There are no Federal Highway Administration (FHWA), Federal Transit Administration (FTA), or State standards for construction-related vibration impacts. According to the FHWA, construction vibrations very rarely reach the levels that can damage structures. For this analysis, potential structural damage and human annoyance associated with vibration from construction activities is based on vibration limits established by the California Department of Transportation (Caltrans), identified in Tables 4.5-4 and 4.5-5, respectively. The existing Newport Crest condominiums north of the Project site would be considered older residential structures for vibration impact assessment.

TABLE 4.5-4
VIBRATION THRESHOLDS FOR STRUCTURAL DAMAGE

Structure and Condition	Maximum ppv (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.20	0.10
Historic and some old buildings	0.50	0.25
Older residential structures	0.50	0.30
New residential structures	1.00	0.50
Modern industrial/commercial buildings	2.00	0.50

Note: Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

ppv: peak particle velocity

Source: Caltrans 2004.

TABLE 4.5-5
HUMAN RESPONSE TO TRANSIENT VIBRATION

Average Human Response	ppv (in/sec)
Severe	2.0
Strongly perceptible	0.9
Distinctly perceptible	0.24
Barely perceptible	0.035

ppv: peak particle velocity

Source: Caltrans 2004

4.5.4 METHODOLOGY

The noise study area is defined as the Project site and the contiguous residential properties. An ambient noise survey was conducted by BonTerra Consulting on July 1 and July 11, 2009, and on August 31 to September 1, 2009. The ambient noise surveys were conducted to document the existing noise environment at six locations in the study area, as shown on Exhibit 4.5-1.

Noise level measurements were taken using a Larson Davis Laboratories Model 831 integrating sound level meter (LD 831). The LD 831 sound level meter and microphone were mounted on a tripod, four feet above the ground and equipped with a windscreen during all measurements. The LD 831 was calibrated before and after use with a Larson Davis Model CAL200 acoustical calibrator to ensure that the measurements would be accurate.

The sound level meter was programmed in “slow” mode to record noise levels in A-weighted form. Meteorological conditions during all measurement periods were favorable; with clear skies, daytime temperatures on July 1 and July 11 were approximately 65 to 70 degrees Fahrenheit (°F), and up to 10 mile per hour (mph) winds. On August 31 and September 1, daytime temperatures reached 80°F and winds were calm.

Short-term noise level measurements were collected at four locations near the adjacent residential areas for at least ten minutes during a typical afternoon, evening and Saturday morning. An additional 15-minute noise level measurement was taken at the location of the

proposed southern soccer field on a typical weekday afternoon, location 5. In addition to the short-term noise monitoring, noise was measured at the first floor patio of 17 Encore Court in the Newport Crest Condominiums, location 6, for 24 hours to obtain the ambient noise daily pattern and the resulting CNEL level at that location. The short-term noise measurements at locations 1 to 5 were converted to CNEL according to the time of the day the measurements were taken and the daily noise pattern measured at Location 6.

4.5.5 EXISTING CONDITIONS

The primary source of noise on the Project site is from traffic on West Coast Highway and Superior Avenue. Superior Avenue is a four-lane divided roadway and West Coast Highway is a six-lane divided road.

Existing Sensitive Receptors

Noise-sensitive receptors are generally considered to be those people engaged in activities or utilizing land uses that may be subject to the stress of significant interference from noise. Activities usually associated with sensitive receptors include, but are not limited to, talking, reading, and sleeping. Land uses often associated with sensitive receptors include residential dwellings, hotels, hospitals, day care centers, and educational facilities. The nearest noise-sensitive receptors to the Project site are the Newport Crest condominiums located immediately north of the site. An existing six-foot-high sound wall is located on the northeastern portion of the Project site extending from the Newport Crest site approximately 150 feet southerly parallel to Superior Avenue.

Existing Noise Conditions

As previously noted, short-term noise level measurements were collected at four locations adjacent to the adjacent residential areas for a minimum period of ten minutes during a typical afternoon, evening, and Saturday morning. An additional 15-minute noise level measurement was taken at the location of the proposed northern soccer field on a typical weekday afternoon. The short-term noise monitoring results are included in Appendix D.

The L_{eq} values taken at each ambient noise measurement location are presented in Table 4.5-6. As shown in the table, during the survey, the average existing noise level (L_{eq}) during weekdays ranged from 47 dBA to 57 dBA, and on Saturday morning ranged from 41 to 55 dBA. The highest ambient noise levels were observed during the weekdays at the southern and eastern portions of the Project site nearest to West Coast Highway and Superior Avenue. Due to distance from the roads and topography, all of the noise-sensitive areas north of the site are currently exposed to noise levels that are less than 60 dBA L_{eq}.

Noise was measured at the first floor patio of 17 Encore Court in the Newport Crest Condominiums for a period of 24 hours to obtain the ambient noise daily pattern and the resulting CNEL level at that location. The hourly average noise levels ranged from 39.8 to 56.3 dBA L_{eq}. The 24-hour CNEL at that location is 54 dBA CNEL. The hourly noise data from this noise level measurement are provided in Exhibit 4.5-2. The short-term noise measurements at Locations 1 to 5 were converted to CNEL according to the time of the day the measurements were taken and the daily noise pattern measured at Location 6. The CNEL noise level at Location 1 is 59 dBA CNEL; at Location 2 is 54 dBA CNEL; at Location 3 is 53 dBA CNEL; at Location 4 is 50 dBA CNEL; and at Location 5 is 60 dBA CNEL.

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Noise Measurement Locations

Exhibit 4.5-1

Sunset Ridge Park EIR

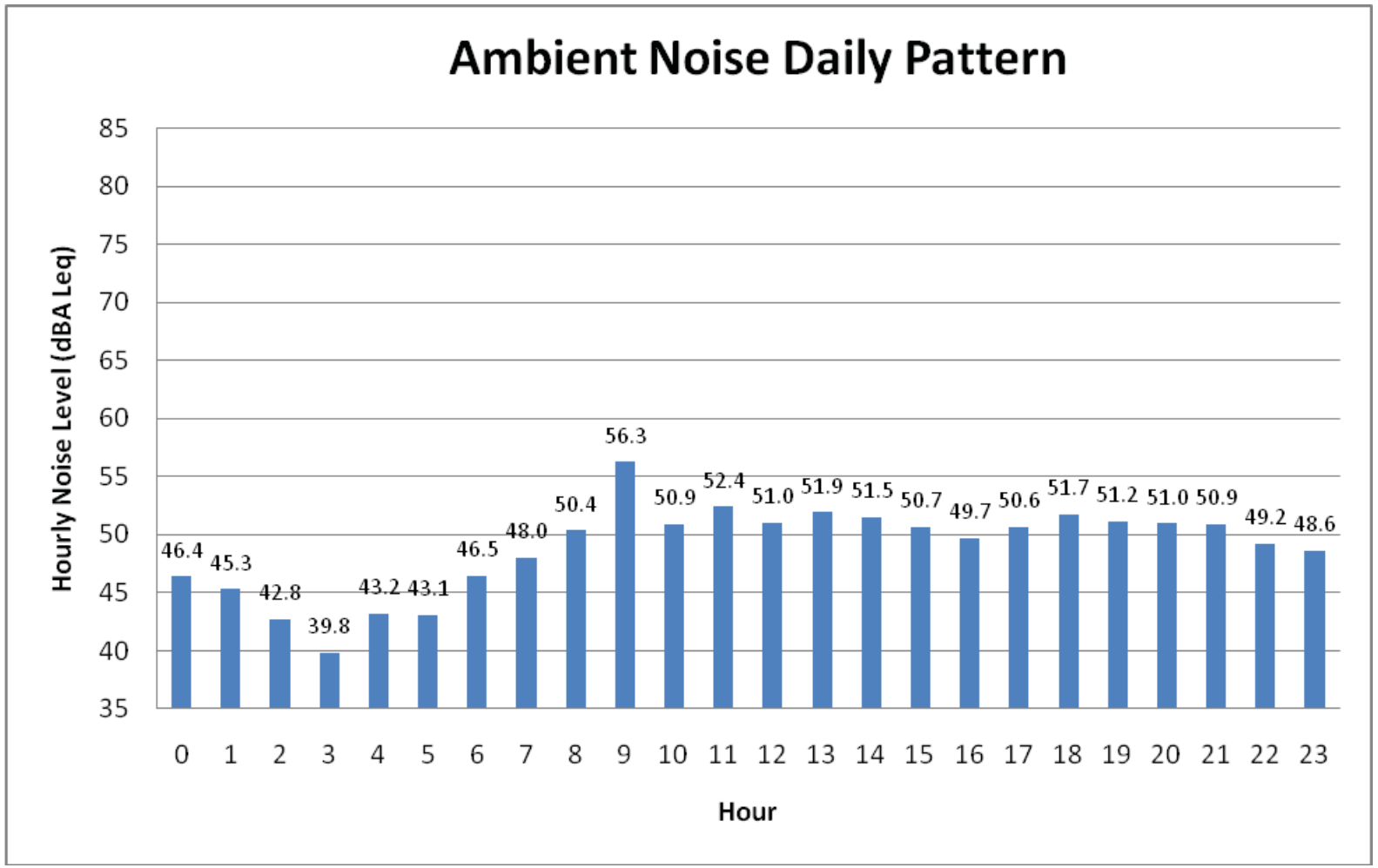
N W E S

150 75 0 150

Feet

Bonterra CONSULTING

(REV: JFG 10-12-09)R:\Projects\Newport\J016\Graphics\EIR\Ex4.5-1_Noise_Loc.pdf



Source:

Noise Monitoring Location 6 Hourly Results

Exhibit 4.5-2

Sunset Ridge Park EIR

BonTerra CONSULTING

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TABLE 4.5-6
EXISTING NOISE CONDITIONS

Location	Description	Duration	Major Noise Source (traffic on)	Noise Level			
				Weekday Afternoon (dBA L_{eq})	Weekday Evening (dBA L_{eq})	Weekend Morning (dBA L_{eq})	CNEL
1	Northeast corner of the site approximately 15 ft from Superior	15 min	Superior; Coast Hwy	57	56	55	59
2	Located adjacent to nearest patio from the proposed northern soccer field	15 min	Coast Hwy	51	51	47	54
3	Located adjacent to nearest patio from the baseball field	15 min	Coast Hwy	50	50	44	53
4	Located adjacent to nearest patio from the parking lot	15 min	Coast Hwy	48	47	41	50
5	Located on the south portion of the proposed southern soccer field	15 min	Coast Hwy	57	N/A	N/A	60
6	Located in the balcony of 17 Encore Ct.	24 hrs	Superior; Coast Hwy	52	51	N/A	54
N/A: data not available							

4.5.6 PROJECT DESIGN FEATURES AND STANDARD CONDITIONS

Project Design Features

PDF 4.5-1 The Project includes landscaped berms between active park uses and the Newport Crest Condominium development to provide for noise attenuation.

Standard Conditions and Requirements

SC 4.5-1 Grading and construction plans shall include a note indicating that loud noise-generating project construction activities (as defined in Section 10.28.040 of the noise ordinance) shall take place between the hours of 7:00 AM and 6:30 PM on weekdays, and from 8:00 AM to 6:00 PM on Saturdays. Loud noise generating construction activities are prohibited on Sundays and federal holidays.

4.5.7 THRESHOLDS OF SIGNIFICANCE

The following threshold criteria are from the City of Newport Beach Initial Study Checklist. The Project would result in a significant impact related to noise if it would:

Threshold 4.5-1 Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

Threshold 4.5-2 Result in a substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project.

Threshold 4.5-3 Expose people to or generate excessive groundborne vibration or groundborne noise levels.

Threshold 4.5-4 Result in a substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project.

As previously discussed in Section 2.3.3, Effects Found Not to be Significant, the City, through the preparation of the Initial Study, determined that the proposed Project would not have a significant impact for the following thresholds and no further analysis was required.

- For a project located within 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?

- For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

  The Project site is not located within an adopted Airport Land Use Plan or in the vicinity of a private airstrip, heliport, or helistop. The nearest airport is John Wayne Airport located approximately four miles northeast of the site. The Project site would not be subject to excessive noise levels related to aircraft or airport operations.

4.5.8 ENVIRONMENTAL IMPACTS

Threshold 4.5-1 ***Would the project expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?***

Threshold 4.5-2 ***Would the project result in a temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?***

Noise impacts associated with the proposed Project were addressed for both construction and operation. Construction noise would be related primarily to the use of heavy equipment during the grading phase of construction. The proposed park would create a new source of noise in the residential community from children playing, yelling and cheering at the playground areas and during organized soccer and baseball games, dogs barking, landscaping maintenance activities, and other park-related activities. These types of noise are not out of character with a residential neighborhood and would be considered generally compatible.

Construction of the proposed Project is planned to occur in a single construction phase over an approximate 16 to 18-month period. Mass grading of the park site and haul road would include the on-site cut and fill of approximately 130,000 cubic yards (cy) of cut and 96,000 cy of fill, with a net export of approximately 34,000 cy. The City proposes that the exported soil would be placed on the adjacent Newport Banning Ranch property; however, an off-site location or combination of locations are options for export of the soil. The remainder of the remaining material would be balanced on the Project site.

The noise levels during construction of the proposed Project would vary during the construction period, depending upon the construction phase. During construction, sensitive receptors at the first row of condos would be exposed to occasional high noise levels and groundborne vibration associated with the operation of heavy equipment including loaders, scrapers, dozers, and loaded haul trucks.

Each phase of construction has a specific equipment mix, depending on the work to be accomplished during that phase. Each phase also has its own noise characteristics; some would have higher continuous noise levels than others, and some have high-impact noise levels. The L_{eq} of each phase is determined by combining the L_{eq} contributions from each piece of equipment used in that phase (FTA 2006). Power variation is accounted for by describing the noise at a reference distance from the equipment operating at full power and adjusting it based on the duty cycle of the activity to determine the L_{eq} of the operation (FTA 2006). Typical duty cycles (the percentage of time during which equipment is operated) and noise levels generated by representative pieces of equipment are listed in Table 4.5-7. In typical construction projects, grading activities typically generate the highest noise levels since grading involves the largest equipment.

TABLE 4.5-7
TYPICAL MAXIMUM CONSTRUCTION EQUIPMENT NOISE LEVELS

Equipment	Noise Level (dBA) at 50 ft	Typical Duty Cycle
Auger Drill Rig	85	20%
Backhoe	80	40%
Blasting	94	1%
Chain Saw	85	20%
Clam Shovel	93	20%
Compactor (ground)	80	20%
Compressor (air)	80	40%
Concrete Mixer Truck	85	40%
Concrete Pump	82	20%
Concrete Saw	90	20%
Crane (mobile or stationary)	85	20%
Dozer	85	40%
Dump Truck	84	40%
Excavator	85	40%
Front End Loader	80	40%
Generator (25 KVA or less)	70	50%
Generator (more than 25 KVA)	82	50%
Grader	85	40%
Hydra Break Ram	90	10%
In situ Soil Sampling Rig	84	20%
Jackhammer	85	20%
Mounted Impact Hammer (hoe ram)	90	20%
Paver	85	50%
Pneumatic Tools	85	50%
Pumps	77	50%
Rock Drill	85	20%
Scraper	85	40%
Tractor	84	40%
Vacuum Excavator (vac-truck)	85	40%
Vibratory Concrete Mixer	80	20%

KVA = kilovolt amps

Source: Thalheimer 2000.

For the proposed Project, mass grading equipment has the potential to generate the highest noise levels. It is anticipated that the mass grading would occur over a period of approximately three months early in the project construction effort. Noise from localized point sources (such as construction) decreases by approximately 6 dBA with each doubling of distance from source to receptor. The loudest equipment would be grading equipment such as scrapers, dozers, loaders, and dump trucks. The maximum short-duration noise level to an occupied residence would occur when a large piece of equipment is operational nearest to a residence on the northern boundary of the Project site nearest to the Newport Crest Condominium development; this piece of equipment would reach levels of up to 85 dBA at 50 feet. However, maximum noise levels would typically last a few minutes and would occur only sporadically during the daytime hours depending upon the specific location of work. These noise levels would diminish rapidly with distance between the equipment and the receptor at a rate of approximately 6 dBA per doubling of distance. For example, a noise level of 85 dBA measured at 50 feet from the noise source to the receptor would be reduced to 79 dBA at 100 feet from the source to the receptor, and would be further reduced to 73 dBA at 200 feet from the source to the receptor.

Variation in power, equipment location, and terrain imposes complexity in characterizing the noise source level from construction equipment. For the purpose of this analysis, the average construction noise levels were calculated assuming that all construction equipment during mass grading (three scrapers, two loaders, one dozer, one grader, and one water truck) operating simultaneously at the center of the site. Using the maximum noise levels and utilization factors shown on Table 4.5-7 and assuming no attenuation due to topography, the average noise levels at the condominiums north the site would range from 74.8 to 61.2 dBA L_{eq}; this assumes that the residences are located from approximately 200 to 700 feet from the center of the site. Construction noise also has the potential to generate perceptible noise levels at residences located approximately 200 feet south of West Coast Highway, and 500 feet south of the center of construction activity. These residences are located behind an existing seven-foot-high noise barrier. While construction noise would be generally overshadowed by traffic on West Coast Highway, it is expected that grading equipment activities could be sporadically heard during periods of low traffic activity on West Coast Highway.

As much as 34,000 cy of soil could be exported to the Newport Banning Ranch property during the mass grading phase of construction. The haul route would be located as near as approximately 50 feet from the buildings on Ima Loma Court in the southwestern corner of the Newport Crest Condominium development (see Figure 3-12 in Section 3.0, Project Description). Dump trucks passbys can generate maximum noise levels of 84 dBA L_{max} at a distance of 50 feet (Table 4.5-7).

Construction activities would be generally heard above the existing noise levels and would create a temporary annoyance. As the center of construction activity moves, the impacts of construction noise at a single residence diminish with distance. Construction equipment would have the potential to generate temporary noise impacts well above the existing ambient noise levels (Table 4.5-6). According to the City of Newport Beach Noise Ordinance, noise sources associated with construction, repair, remodeling, or grading of any real property are exempt from the noise level limits stated in Section 10.26.025 of the City's Noise Ordinance, provided said activities take place between the hours of 7:00 AM and 6:30 PM on weekdays, and from 8:00 AM to 6:00 PM on Saturdays. Compliance with the Municipal Code would limit construction activities that produce loud noise levels to the daytime hours. Although the Project construction would be in compliance with the Noise Ordinance, some construction noise levels could be approximately 10 to 25 dBA above the ambient noise levels. Due to the comparatively low existing ambient noise levels and the proximity of the noise-sensitive receivers, construction would result in a temporary substantial increase in ambient noise to the residences adjacent to

the site resulting from the use of grading mobile equipment. Construction of the Project would result in an unavoidable short-term significant impact that would cease upon completion of the noisier activities in the early months of Project construction.

In addition to construction noise from the Project site, the Project construction would cause a temporary increase in traffic and traffic noise primarily along West Coast Highway due to movement of equipment and workers to and from on the site. Due to existing high traffic volumes on West Coast Highway, construction traffic would not result in a significant increase in traffic volumes along in the vicinity of the Project and would not increase traffic noise levels significantly. Although truck traffic noise may occasionally be noticed by residents south of the site across West Coast Highway, the volume of trucks would not be substantial and annoyance is anticipated to be minimal. This off-site noise impact would be less than significant.

Impact Summary: ***Significant Unavoidable Impact.*** Construction equipment would have the potential to generate temporary noise impacts above the existing ambient noise levels. The City Noise Ordinance identifies that noise sources associated with construction are exempt from the City's Noise Ordinance standards, provided said activities take place between the hours of 7:00 AM and 6:30 PM on weekdays, and from 8:00 AM to 6:00 PM on Saturdays. Due to the low existing noise levels and the proximity of the noise-sensitive receivers and duration, construction would result in a temporary substantial increase in ambient noise to the residences adjacent to the site resulting from the use of mobile grading equipment. To reduce potential construction noise impacts, a temporary barrier with a length of approximately 1,500 feet and the height of approximately 20 feet would be required. Due to necessary size of the barrier and the fact that it would block the views from the adjacent residential areas, the construction of a temporary noise barrier would not be feasible. Construction of the Project would result in an unavoidable short-term significant impact that would cease upon completion of construction activities.

Threshold 4.5-1 ***Would the project expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?***

Threshold 4.5-4 ***Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?***

Operational (Long-Term) Noise

Land Use Compatibility

Existing noise levels were recorded during a typical weekday afternoon on the proposed southern soccer field. The measurement was taken at the nearest location from West Coast Highway approximately 230 feet from the road centerline. This worst-case location recorded 57 dBA L_{eq}.

Land use compatibility is determined by the future noise level anticipated on a Project site and the proposed land use on that site. An ambient noise level of up to 65 dBA CNEL is considered acceptable for park uses (see Table 4.5-1).

The primary source of noise in the Project area is traffic on West Coast Highway and Superior Avenue. Typically, near-term noise levels would also be lower than the future "buildout" or cumulative noise levels. According to the future noise contours for buildout conditions included in the City's General Plan Noise Element, the 60 dBA CNEL measurement was taken outside the planned recreational areas of the park. Exhibit 4.5-3 presents the anticipated 60 and 65 dBA CNEL contours in the Project site area. As shown, the 65 dBA CNEL does not extend to the proposed activity areas within the park. Therefore, the current and future ambient noise levels are compatible with park uses.

Park Activities

The proposed park would include a baseball field and two youth soccer fields. Activities in these areas would have the potential to create noise impacts to the residential areas north of the site. The park would not be equipped with nighttime lighting so all activities would occur during the daytime. All activities within the Project site would be required to comply with the City of Newport Beach Noise Ordinance, which limits daytime noise levels to the nearby residential areas to 55 dBA L_{eq}. Noise from baseball and soccer activities has been estimated based on sound level data collected at similar park facilities in the City of Thousand Oaks (EDAW 2008). Baseball activities were monitored at a Saturday game with spectators, measuring 50 dBA at 190 feet from the center of the field. Soccer activities were recorded at a field with approximately 85 participants and spectators and measured 60 dBA L_{eq} from the edge of midfield (approximately 65 feet away). The noise impact from the various park activities was calculated at the patios and balconies that would be closest to the proposed noise activities areas. Noise attenuation for these sources is assumed to be 7.5 dBA per doubling of distance since these uses would be separated from the surrounding residences by grass fields and landscaped areas, contrasted to the 6 dBA factor used for hard surfaces.

Table 4.5-8 shows that the noise impacts to the nearest Newport Crest Condominium development patios and balconies from soccer activities would be 48.6 dBA L_{eq} assuming both fields are being used simultaneously. Noise from baseball activities would be 51.9 dBA L_{eq} from the same location. The baseball field and soccer fields cannot be used concurrently so no noise levels are given for this scenario.

TABLE 4.5-8
BASEBALL AND SOCCER ACTIVITIES NOISE IMPACTS TO NEAREST NEWPORT CREST PATIOS AND BALCONIES

Noise Source	Distance To Observer Location (In Feet)	Exterior Noise Levels (L_{eq} dBA)
Baseball	**160**	**51.9**
Soccer		
South Field	385	40.7
North Field	200	47.8
Soccer Total - concurrent use of both fields		**48.6**

The noise level measurements taken adjacent to the patios and balconies nearest to the proposed soccer and baseball fields (Buildings C and D) ranged from 50 to 51 dBA L_{eq} during the weekdays. Table 4.5-9 shows that when the park activities are combined with the existing weekday ambient noise, the noise increase from park activities at the nearest noise-sensitive receptors would range from 2.0 to 4.1 dBA Leq. During the weekends, the noise level measurements taken adjacent to the patios and balconies nearest to the proposed soccer and

Ima Loa Ct.
Columbia St.
Landfall Ct.
Swift Ct.
Encore Ct.
Ticonderoga St.
Tribute Ct.
West Coast Highway
Superior Avenue
Wall
E
D
C
B
A
4
3
2
5
6
1

60 dBA CNEL Noise Level Contour
65 dBA CNEL Noise Level Contour
Noise Measurement Locations
Project Boundary
A Building

D:\Projects\Newport\J016\MXD\Ex_Noise_Mon_Loc.mxd

CNEL Noise Level Contours

Exhibit 4.5-3

Sunset Ridge Park EIR

N W E S

150 75 0 150 Feet

Bonterra CONSULTING

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baseball fields ranged from 44 to 47 dBA Leq. Table 4.5-10 shows that, when the park activities are combined with the existing weekend ambient noise, the noise increase from park activities at the nearest noise sensitive receptors would range from 3.9 to 8.6 dBA L_{eq}. While park activities would generate perceptible noise increases, they would result in noise levels well below the City of Newport Beach 55 dB L_{eq} daytime noise standard.

TABLE 4.5-9
BASEBALL AND SOCCER ACTIVITIES WEEKDAY NOISE CONTRIBUTIONS TO NEAREST NEWPORT CREST PATIOS AND BALCONIES

Activity	Condition	Weekday Exterior Noise Levels (L_{eq} dBA)
Baseball	Noise from Baseball Activities	51.9
	Existing Ambient Noise Level	50.0
	Combined Project and Ambient Noise Level	54.1
	Project Contribution	4.1
Soccer	Noise from Soccer Activities	48.6
	Existing Ambient Noise Level	51.0
	Combined Project and Ambient Noise Level	53.0
	Project Contribution	2.0
Daytime Residential Noise Standard for City of Newport Beach		**55.0**

TABLE 4.5-10
BASEBALL AND SOCCER ACTIVITIES WEEKEND NOISE CONTRIBUTIONS TO NEAREST NEWPORT CREST PATIOS AND BALCONIES

Activity	Condition	Weekday Exterior Noise Levels (L_{eq} dBA)
Baseball	Noise from Baseball Activities	51.9
	Existing Ambient Noise Level	44.0
	Combined Project and Ambient Noise Level	52.6
	Project Contribution	8.6
Soccer	Noise from Soccer Activities	48.6
	Existing Ambient Noise Level	47.0
	Combined Project and Ambient Noise Level	50.9
	Project Contribution	3.9
Daytime Residential Noise Standard for City of Newport Beach		**55.0**

Grading and Removal of the Noise Barrier adjacent to Superior Avenue

The current topography combined with the existing six-foot-high wall along Superior Avenue provides noise attenuation to several condominiums facing south in the Newport Crest development that are in close proximity to Superior Avenue. The removal of the existing wall and the proposed park grading has the potential to expose residents to more traffic noise from Superior Avenue. An analysis was performed to evaluate the effect of the proposed change in the park site topography on future traffic noise impacts from Superior Avenue to the nearby residences. The traffic noise impacts were modeled with the FHWA's Traffic Noise Model (TNM) version 2.5. TNM is the FHWA's computer program for highway traffic noise prediction and

analysis. The future noise levels were modeled according to PM peak hour traffic volumes for year 2013 (Kimley-Horn 2009). The noise impacts were modeled for first floor patios and second floor balconies at 20 condominiums at the buildings adjacent to the Project site. Sixteen receiver locations were modeled at Building A, 8 receiver locations were modeled at Buildings B and C (i.e., 8 locations for each building), and 4 receiver locations were modeled at Buildings D and E (i.e., 4 locations for each building), totaling 40 receiver locations. Table 4.5-11 summarizes the noise increases/decreases at several locations for each building. The TNM outputs showing the calculation results are included in Appendix D.

The modeled noise levels with Project implementation were compared with the modeled results under existing topography. The proposed landscaping with grass and bushes and trees would increase the site's ground absorption from traffic noise when compared to the existing site's hard soil, which is less absorptive. Due the grading and the implementation of landscaping, the proposed grading would result in traffic noise level changes to patios and balconies facing the Project site from -5 to 2 dBA. Increases would occur at some patios and balconies at buildings A and B, which are nearest to Superior Avenue. Conversely, most patios and balconies at the buildings on Swift Court, Land Fall Court, and Ima Loa Court would experience a reduction in traffic noise levels due to changes in topography and landscaping. There would be no increase in traffic noise levels at Buildings C, D, and E. The highest increases would occur at second floor balconies at the second building (B) from Superior Avenue due to the fact that the proposed topography would expose these receivers to more traffic noise from Superior Avenue.

The City established criteria to determine significant traffic noise increases (Table 4.5-2). A significant noise impact occurs when a project produces a noise increase greater than 3 dBA over existing ambient conditions when existing ambient noise levels are less than 60 dBA CNEL. The existing noise levels at the condominium buildings adjacent to the Project site are less than 60 dBA CNEL; therefore, traffic noise increases of up to 3 dBA are less than significant. Table 4.5-11 summarizes the existing noise levels at each building. The calculated maximum traffic noise increase due to changes in topography and whether a significant noise impact would occur is identified in the table.

TABLE 4.5-11
SITE GRADING POTENTIAL TRAFFIC NOISE IMPACTS

Receptors at building (up to 8 at each)	Existing Noise Level (dBA CNEL)	Allowable Increase (dBA)	Calculated Maximum Increase	Calculated Maximum Decrease	Significant Noise Impact?
A (Tribute Court)	59	3	1	-2	No
B (Encore Court)	54	3	2	-2	No
C (Swift Court)	54	3	0	-3	No
D (Land Fall Court)	53	3	0	-3	No
E (Ima Loa Court)	50	3	0	-5	No
Note: Building locations are shown on Exhibit 4.5-1.					

In summary, change in site topography with project implementation is expected to result in permanent traffic noise increases of up to 2 dBA at some of the patios and balconies facing the Project site. These increases would not exceed the significance criteria for traffic noise increases included in the City's General Plan Noise Element. Noise increases of up to 3 dBA

are “barely perceptible” to most people. Therefore, the change in site topography with project implementation would not result in significant increases in traffic noise to nearby noise sensitive receptors.

Cumulative Impact from Park Activities and Changes in Topography

The greatest noise increase related to park activities would occur at Buildings C and D, nearest to the soccer and baseball fields. Table 4.5-11 shows that there would be no increases in traffic noise at Buildings C and D. Traffic noise increases due to topography would occur at Buildings A and B, farthest from the proposed soccer and baseball fields. Due to distance and topography, noise impacts from park-related activities are expected to be negligible at Buildings A and B. Therefore, there would be negligible cumulative topography-related and park activity-related noise increases.

West Coast Highway at the Park Access Road Traffic Signal Noise Effects

A traffic signal is proposed on West Coast Highway at the park access road to provide access to the project site. A traffic signal would affect a percentage of vehicles going through the intersection as vehicles would stop at the red signal phases. According to field observations, cars that exit an intersection accelerating subsequent to a red phase generate more noise than if they would be cruising at a constant speed. Field observations also show that an intersection has the overall effect of reducing the average traffic speed near the intersection, thus reducing the average traffic noise level. It is expected that the implementation of the proposed traffic signal may change the character of the traffic noise at nearby residences and would have an effect of lowering the average speed, therefore reducing the noise levels at residences in the vicinity of the intersection.

Off-Site Traffic Noise Impacts

Vehicle trips generated by the Project would create new traffic noise on the park access road on the northwest portion of the site, and would also increase traffic noise on adjacent streets adjacent to the Project site. According to the traffic study, the proposed Project is expected to generate approximately 42 weekday PM peak hour trips and 99 Saturday peak hour trips. Project-related traffic would add, on average, approximately 1 car every 36 seconds on the park access road, which is 70 feet from the nearest patio. Due to low traffic volumes and speeds, the noise impacts from traffic on the access road would be less than significant. In addition, Project-related traffic would not add a significant amount of traffic to the study area roadway system. Therefore, Project-related traffic noise impacts would be less than significant.

Impact Summary: ***Less than Significant.*** With implementation of the proposed Project, traffic-related noise increases would be less than significant. The effects of grading would not result in significant increases in traffic noise to nearby noise-sensitive receptors.

While park activities would generate perceptible noise increases to some noise-sensitive persons, the noise levels would be below the City of Newport Beach 55 dB L_{eq} daytime noise standard. There would be no exposure of persons to or generation of noise levels in excess of the applicable standards, nor would there be a substantial increase in permanent noise levels.

Threshold 4.5-3 Would the project expose people to or generate excessive groundborne vibration or groundborne noise levels?

The effect of construction vibration would depend upon the amount and type of construction planned under each phase, the distance between construction activities, and the nearest vibration-sensitive receptor. Table 4.5-12 presents a list of anticipated vibration levels during typical construction activities. The construction of the Project would not require pile driving or blasting. The most substantial vibration sources associated with Project construction would be the equipment used during grading and preparation of the Project site.

TABLE 4.5-12
TYPICAL VIBRATION LEVELS DURING CONSTRUCTION

Equipment		PPV at 25 ft (in/sec)[a]
Pile Driver (impact)	Upper range	1.518
	Typical	0.644
Pile Driver (sonic)	Upper range	0.734
	Typical	0.170
Vibratory Roller		0.210
Large bulldozer		0.089
Caisson drilling		0.089
Loaded trucks		0.076
Jackhammer		0.035
Small bulldozer		0.003

ft – feet; ppv – peak particle velocity; in/sec – inches/second
[a]The ppv is defined as the maximum instantaneous positive or negative peak of the vibration signal, usually measured in in/sec.

Source: FTA 2006

The nearest vibration-sensitive receptors are located as near as ten feet from the northern boundary of the site. Although it is possible for vibration from construction Projects to cause building damage, vibration from construction activities are almost never of sufficient amplitude to cause more than minor cosmetic damage to buildings. As vibration levels would drop rapidly with distance, construction vibration levels would be well below the 0.5 in/sec ppv threshold for structural damage (Table 4.5-4). The vibration data provided in Table 4.5-12 and vibration propagation calculations indicate that construction equipment vibration levels would be below the 0.24 in/sec ppv level of distinct perceptibility (Table 4.5-5) when heavy construction equipment is operating at distances over 15 feet from the Project site boundary. Therefore, vibration may be noticeable for short periods, but it would not likely be annoying and would not be a significant impact.

Impact Summary: ***Less than Significant Impact.*** Vibration may be noticeable for short periods during construction, but it would be temporary and periodic and would not be excessive; vibration would not be a significant impact.

4.5.9 CUMULATIVE IMPACTS

A cumulative impact is the effect on the environment that results from the incremental impact of the proposed Project when combined with the effects of other past, present, and reasonably foreseeable future Projects. The significance of a cumulative impact may be greater than the

effects resulting from the individual actions when the effects of more than one action are considered together.

Cumulative Construction Noise and Vibration

Adverse noise and vibration impacts during construction of the proposed Project would be localized and would occur intermittently for varying periods of time throughout the construction period. Short-term cumulative impacts related to ambient noise and vibration levels could occur if construction associated with the proposed Project as well as surrounding current and future development were to occur simultaneously. Noise and vibration associated with construction of the proposed Project in combination with other Projects within approximately 600 feet of the Project site boundaries could adversely impact sensitive receptors in the vicinity of the Project with a cumulative noise level greater than the noise generated solely at the Project site. The proposed Newport Banning Ranch project is the only reasonable foreseeable project in the vicinity of the Project site. Based on the proposed schedule for the Newport Banning Ranch Project, if that project is approved, construction would occur after completion of the proposed Project. There are no other known related projects located within 600 feet of the Project site; therefore, there would be no cumulative noise or vibration impacts.

Cumulative Operational Noise

The proposed Project is expected to generate approximately 42 weekday PM peak hour trips and 99 Saturday peak hour trips, with a maximum of 35 peak hour trips on Superior Avenue. Compared with the existing approximately 2,000 and 5,000 weekday peak hour volumes on Superior Avenue and West Coast Highway, respectively, Project-related traffic would add less than 2 percent of existing traffic to the study area roadway system. An increase of less than 2 percent in traffic would generate a traffic noise increase of less than 0.1 dB, which would not be perceptible even for the most noise-sensitive person. Therefore, Project-related traffic noise impacts would be less than significant.

As noted above the Project would not result in significant traffic noise impacts along roadways near to the Project site. Therefore, no cumulative noise impacts would occur.

4.5.10 MITIGATION PROGRAM

Project Design Features

PDF 4.5-1 The Project includes landscaped berms between active park uses and the Newport Crest Condominium development to provide for noise attenuation.

Standard Conditions and Requirements

SC 4.5-1 Grading and construction plans shall include a note indicating that loud noise-generating project construction activities (as defined in Section 10.28.040 of the noise ordinance) shall take place between the hours of 7:00 AM and 6:30 PM on weekdays, and from 8:00 AM to 6:00 PM on Saturdays. Loud noise generating construction activities are prohibited on Sundays and federal holidays.

Mitigation Measures

Construction Noise Abatement

MM 4.5-1 Prior to the start of grading, the Project Manager shall provide evidence acceptable to the Public Works Director and/or Planning Director, that:

a. All construction vehicles or equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers.

b. Stationary equipment, such as generators and air compressors, would be located as far from local residences as feasible.

c. Equipment maintenance and staging areas would be located as far away from local residences, as feasible.

d. Stockpiling and/or vehicle staging areas shall be located as far as practicable from dwellings.

4.5.11 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Construction equipment would have the potential to generate temporary noise impacts well above the existing ambient noise levels. Due to the low existing noise levels and the proximity of the noise-sensitive receivers, construction would result in a temporary significant increase in ambient noise to the residences adjacent to the site, principally during the mass grading activities that are anticipated to occur for a duration of approximately three months. Construction of the Project would result in an unavoidable short-term significant impact that would cease upon completion of the Project.

With implementation of the proposed Project, noise increases associated with activities at the park and Project-related traffic would be less than significant. Therefore, the long-term noise impacts would be less than significant.