

**Noise**

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# SECTION 4.10

## 4.10 NOISE

This noise impact analysis is based upon a noise report prepared for the applicant (*Revised Community Noise Analysis for Willow Springs Phase II*, URS Corporation, June 2010) and a third party review and supplemental analysis provided by Giroux and Associates. The URS report (provided in Appendix G) utilized accepted analysis procedures and identified standard mitigation requirements. The EIR consultant generally concurs with the findings of the URS report. This section incorporates the URS analysis and provides supplemental analysis including minor amplification, discussion of haul truck traffic noise, and a discussion of project traffic noise.

### 4.10.1 Existing Conditions

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Noise is generally defined as unwanted sound. Sound is characterized by various parameters that describe the physical properties of sound waves. These properties include the rate of oscillation (frequency), the distance between successive troughs or crests, the speed of propagation, and the pressure level or energy content of a given sound wave. In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level.

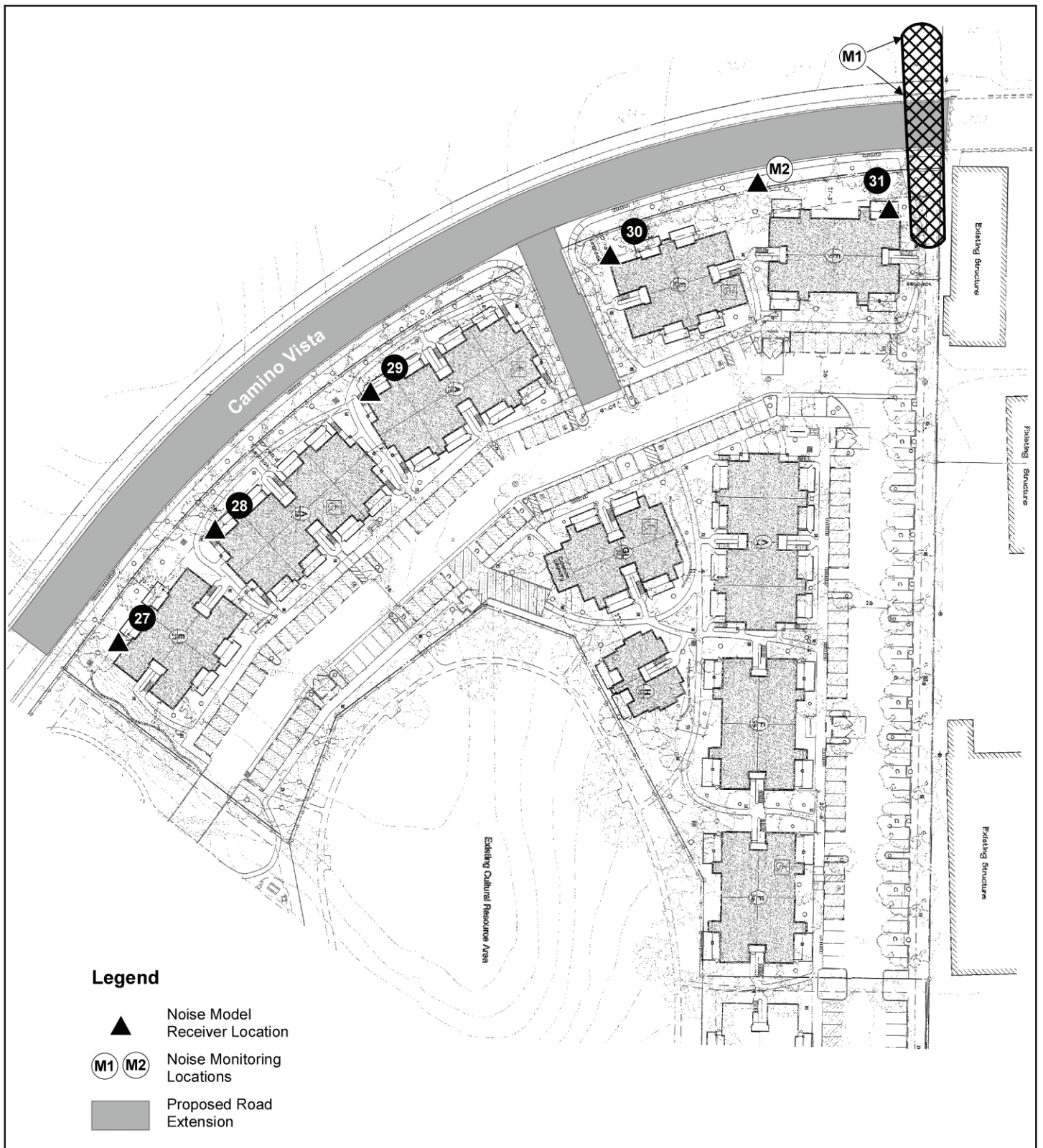
The unit of sound pressure expressed as a ratio to the faintest sound detectable to a person with normal hearing is called a decibel (dB). Sound or noise can vary in intensity by over one million times within the range of human hearing. A logarithmic loudness scale similar to the Richter scale for earthquake magnitude is therefore used to keep sound intensity numbers at a convenient and manageable level. The human ear is not equally sensitive to all sound frequencies within the entire spectrum. Noise levels at maximum human sensitivity from around 500 to 2,000 cycles per second are factored more heavily into sound descriptions in a process called "A-weighting," written as "dBA." Any further reference to "decibels" written as dB in this document should be understood to be A-weighted.

Alternatively, a statistical description of the sound level that is exceeded over some fraction of a given observation period can also be used to describe typical time-varying instantaneous noise. Finally, because community receptors are more sensitive to unwanted noise intrusion during more sensitive evening and nighttime hours, State law requires that an artificial dB increment be added to quiet time noise levels. The 24-hour noise descriptor with a specified evening and nocturnal penalty is called the Community Noise Equivalent Level (CNEL). A similar metric called the "day-night level" written as Ldn is also commonly used. In practice, CNEL and Ldn are almost identical.

### Baseline Noise Levels

Existing noise levels on the project site derive mainly from roadway traffic noise (Los Carneros Road, U.S. Highway 101 southbound on-ramp, and to a lesser extent, traffic on U.S. Highway 101). Other sources include industrial noise to the east, distant aircraft, and intermittent trains on UPRR tracks to the north. The site is outside the Santa Barbara Airport noise impact zone, but individual noise events from aircraft are sometimes audible on the project site.

Noise measurements were conducted by URS at two locations (M1 and M2) as shown in **Figure 4.10-1**. Measurements were made on January 15, 2009 using a Larson-Davis Noise Level



Source: URS, 2010.

Meter. M1 covered the strip of land along the eastern project boundary adjacent to existing industrial uses, discussed further in Section 2.2.2 below. A second point (M2) was located near the residential structure most exposed to the dominant noise sources (vehicle traffic). This second point was near the northwest corner of proposed Building 31 on top of the stockpiled fill in this part of the project site. The ground elevation of about 35 feet above mean sea level (msl) was higher than the designed finished floor elevation, and about two feet below the proposed second story floor elevation for Building 31. The noise meter microphone was mounted at a height of about 7 feet above the ground surface to provide a resulting elevation of about 42 feet msl, which is a close approximation to a person standing on a second story balcony at this location. The meter location was closer to the alignment of Camino Vista Road, however, being about 40 feet from the centerline of the roadway, while the nearest building (number 30) would be about 60 feet from the centerline. The baseline measurements provide the existing condition that does not include the future Camino Vista Road and related traffic, but would include any perceptible noise from the adjacent Aero Camino industrial area.

### ***Roadway Traffic Noise***

The dominant noise on the project site originates from vehicle traffic on Los Carneros Road and on the southbound on-ramp entering Highway 101 north of the site. Traffic along the highway itself also contributes some noise. The large earthen berm supporting the southbound on-ramp blocks the line of sight to the highway and much of its vehicle noise.

For monitoring point M2, which was chosen to provide a characterization of roadway traffic noise, the 1-minute Leq values generally ranged between 50 and 60 dBA, and the overall Leq for the 70 minute monitoring period was 53.9 dBA.

### ***Aero Camino Industrial Noise***

The noise measurements taken in area M1 were obtained by carrying the noise meter and walking slowly along the eastern property boundary northward and southward from the existing stub-out of Camino Vista west of Aero Camino. Several light industrial uses occur in this area, including semi-enclosed machining areas and loading docks. Noise sources included a medium-duty truck entering and leaving a loading area, large fans providing building ventilation, electrically-driven fluid pumps, and one noticeable air compressor that cycled on and off one time during the measurement. The highest one-minute Leq value was 59.5 dBA from the air compressor, which was at a distance of about 15 feet when this measurement was made. The overall Leq along this property line was 52.6 dBA.

### ***Railroad Noise***

A UPRR line is located north of the project site. The Noise Element of the City of Goleta (City) General Plan/Coastal Land Use Plan provides that maximum instantaneous noise levels from passing trains range from 96 to 100 dBA at a distance of 100 feet, and that the average CNEL at this distance ranges from 70 to 75 dBA.<sup>1</sup> Measurements of train noise nearby for the Village at Los Carneros gave results similar to this estimate with peak noise levels at 100 feet of 93.5 dBA for an Amtrak passenger train and 99.0 dBA for a freight train.<sup>2</sup>

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<sup>1</sup> City of Goleta General Plan, 2006, Page 9-3.

<sup>2</sup> The Village at Los Carneros, FEIR, November 2007.

During the noise measurements for the project, two Amtrak passenger trains passed the project site. The first, just at the beginning of the measurement at point M2, involved an Amtrak train moving very slowly northward, perhaps on the siding adjacent to the UPRR main line. Then the train moved slowly southward (eastward) towards the Goleta station. These very slow movements did not generate any discernable noise. Near the end of the measurement period, however, the train sounded its horn one time and then departed the Goleta station moving quickly northward on the UPRR mainline. This movement resulted in a peak in the noise measurement at minute 61 with the following values:

1-minute Leq 63.0 dBA  
6-sec Leq 70.0 dBA  
Maximum slow meter (1/8 sec) reading during minute 72.0 dBA  
Instantaneous peak noise level 83.0 dBA

The monitoring point M2 is approximately 560 feet from the UPRR tracks. Adjusting for distance, the instantaneous peak noise level at 100 feet from this train passage was 98.0 dBA, which agrees well with the values cited earlier from the City Noise Element and prior measurements for the Village at Los Carneros. Based on this result, and on the Noise Element descriptions, the distance to the CNEL 65 dBA contour would range from 178 to 316 feet from the source (train).

The train noise CNEL or Ldn values along the tracks are a function not only of the peak noise level as a train passes, but also of the number of trains per day and the presence of at-grade crossings where warning horns are sounded by train operators. Other factors, such as rail condition, may also influence noise levels to a lesser degree. There are no nearby crossings, but the Goleta Amtrak station is located to the east and the single horn soundings that indicate the start of motion for each train leaving the station is audible at the project site.

The estimates and projections of train noise levels contained in the City of Goleta Noise Element are based on information in the County of Santa Barbara (County) General Plan Noise Element.<sup>3</sup> The County results are based on an average of two passenger trains and 12 freight trains per day along the UPRR tracks. Amtrak currently runs four passenger trains per day along this route. The mix of train types may vary, and the number of daily freight trains ~~has~~ was ~~been~~ lower in 2008 and 2009 due to the national economic downturn. The Santa Barbara Ranch FEIR (County of Santa Barbara, 2008, State Clearinhouse No. 2005011049) reported the frequency of freight train operations as two per day, consistent with the measurements obtained for this project.

“Freight trains pass along this line with varying frequency, but generally number two trains per day on average (Brawley, 2005). Approximately fifty percent of the freight trains pass during the daytime and the other half during the nighttime hours. The typical freight train consists of three locomotives and 100 rail cars, traveling approximately 40 mph.”

However, there are also expectations that the number of freight trains may increase in the future, based on the Sharon Greene Associates, Ventura – Santa Barbara Rail Study, Final Report, March 2008:

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<sup>3</sup> County of Santa Barbara General Plan, Noise Element, 2006, Page 42.

“The UPRR has seen significant growth in freight traffic in recent years. The UPRR moves significant volumes of freight from Northern California to Southern California through the Central Valley Line. Much of this freight traffic flows through the Tehachapi Pass, then into Los Angeles and West Colton and on east via the “sunset” route to points east. Rail congestion in the Tehachapi Pass, which is also shared with BNSF (Burlington Northern Santa Fe) Railway, has caused increased traffic in recent years on the Coast Line. This condition is likely to increase in the future. The anticipated growth in rail freight traffic may affect both the operational and institutional arrangements necessary to accommodate freight as well as increased passenger services. UPRR officials have also indicated that they view the Coast Line as a “safety valve” should the Central Valley Line be blocked for any reason.”

This coastal line is also referred to as the Los Angeles – San Diego – San Luis Obispo I-5 North Coast Corridor or LOSSAN (NCC) and provides both regular freight service and acts as a back-up route in the event that there are problems with the inland freight route. According to the LOSSAN Rail Corridor Agency<sup>4</sup>, the growth in goods imported to the United States from overseas (largely Asia) has been increasing and the “bulk of goods are shipped in containers, which are carried by train to centralized locations, and delivered by truck to their ultimate destinations. Given this increased demand for freight service, and the utility and additional capacity for moving this freight provided by the Coast Route, it is likely that the number of average daily freight trains operating on the LOSSAN North corridor could rise over the next 20 years, depending on business conditions.”

While it cannot be precisely known how many freight trains will ultimately use the nearby rails over the life of the project, fFor the purposes of a long-term projection in this EIR, however, the assumptions in the County Noise Element of 12 freight trains per day likely remain valid is considered and a more-reasonable maximum potential scenario.

In summary, based on the Noise Element assumptions for freight trains, at a distance of 100 feet from the tracks, peak train noise levels range up to about 100 dBA and CNEL (or Ldn) values range up to about 75 dBA. Adjusting these for distance only, yields a peak noise level at monitoring point M2 (also the point of development closest to the tracks) of 85 dBA (83.0 dBA was measured in this study) and a CNEL value of 60.0 dBA. Based on the standard in the City Noise Element, this CNEL value is compatible with residential uses. Actual values at the project site may be slightly lower, since the UPRR tracks are in a depression relative to the project site and the intervening topography provides some shielding of train noise. If one were to account for only two trains, as opposed to 12, there may be a reduction of 3 to 4 dBA contribution to the Ldn value.

### *Aircraft Noise*

The Santa Barbara Airport is located approximately 0.5 mile south of the project site. The departure pattern from Runway 25 (RY 25) at the airport extends westward, and is about one mile south of the site. Runway 25 is the largest runway at the airport and is used for airlines and most business jet traffic. Two shorter runways (15R and 15L) are oriented north-south, and are used predominantly for general aviation.

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<sup>4</sup> LOSSAN Rail Corridor Agency, California Department of Transportation, LOSSAN North Strategic Plan, 2007, p. 4-5

The project site is located north of the 60 dBA CNEL contour in the Airport Land Use Plan (ALUP),<sup>5</sup> and the City Noise Element (Figure 9-2, Existing (2003) Noise Contours-Airport and Railroad, updated November 2009).<sup>6</sup> The southernmost point of the project site is approximately 500 feet north of the closest point of the current 60 dBA noise contour from the airport. The City Noise Element projects a very small reduction in future noise levels from the airport, so the future 60 dBA CNEL noise contour is farther from the project site. Using the City Noise Element standards, the airport related noise levels are compatible with residential uses.

At several points during the monitoring at point M2, aircraft noise was heard and caused small but discernable peaks in the measurements. In most instances, these aircraft were twin turboprop regional jets departing the airport westward on Runway 25 approximately one mile south of the project site. These occurrences are noted in the graph of noise levels in Appendix G, and are summarized below in **Table 4.10-1**.

**Table 4.10-1**  
**Aircraft Noise Levels Measured on the Project Site**

Minute No.	Type and Motion	Leq (i-min) dBA	Lmax (1/8- sec) dBA
14	Regional Jet, depart RY 25	52.0	63.5
23	Regional Jet, depart RY 25	52.0	59.5
24	Regional Jet, depart RY 25	59.0	74.5
45	Regional Jet, depart RY 25	53.0	61.0
46	Regional Jet, depart RY 25	52.0	60.5
50	Cessna 172, depart right downwind RY 15R (northward over project site)	55.5 53.5	64.0
54	Regional Jet, depart RY 25	53.5	69.5
62	Regional Jet, depart RY 25	54.0	64.5

Also during the monitoring periods, several single engine piston airplanes were in the pattern of runway 15R and flew near the site. While the noise from these aircraft was discernable, it was much lower than the noise from vehicle traffic on the adjacent roadways and had no appreciable effect on the noise measurements. This observation is consistent with the results from a long-term airport noise monitoring location about 2,000 feet east of the project site beneath the final approach leg to Runways 15R and 15L, where the reported CNEL value is 55.9 dBA.<sup>74</sup> No helicopters were observed during the monitoring period. Current helicopter operations of all types at the airport (air taxi, military/police, and general aviation) amount to about 11 flights per day out of total daily operations of about 480 flights. This figure is expected to increase little, reaching 13 operations per day by 2025<sup>6</sup>. The voluntary noise abatement arrival and departure procedures in use at the airport direct all helicopter traffic to arrive and depart the airport over the water to the south, except in periods of cloud cover when they should follow U.S. Highway 101 in the same pattern used by light general aviation aircraft.<sup>4</sup>

In summary, the project site is located well outside of the 60 dBA CNEL contour of the Santa Barbara Airport. Aircraft operations, particularly westbound jets approximately one mile south of the project site, can be heard from the project site but do not generate noise levels above

<sup>5</sup> Santa Barbara County Association of Governments, 1993, Map SB-1.

<sup>6</sup> City of Goleta GP/CLUP, Noise Element, 2006.

<sup>6</sup> Santa Barbara Municipal Airport, 2005.

applicable thresholds or guidelines. As with any location in the region, occasional aircraft operations may occur directly over the property, but these are neither frequent nor loud enough to exceed applicable standards.

## Regulatory Framework

### *State Requirements*

An interior CNEL of 45dB is mandated by the State of California Noise Insulation Standards (CCR, Title 24, Part 6, Section T25-28) for multiple family dwellings, hotel and motel rooms. In 1988, the State Building Standards Commission expanded that standard to include all habitable rooms in residential use, including single-family dwelling units. Since typical noise attenuation within residential structures with closed windows is about 20dB, an exterior noise exposure of 65dB CNEL is generally the noise land-use compatibility guideline for new residential dwellings in California. Because commercial and industrial uses are not occupied on a 24-hour basis, the exterior noise exposure standard for less sensitive land uses generally is somewhat less stringent.

### *Local Requirements*

The City requires that potential noise effects be evaluated in terms of either the Community Noise Equivalent Level (CNEL) or the Day-Night Average Noise Level (Ldn), and establishes maximum noise levels that are considered compatible with various land uses. The City's Noise Element has established noise quality standards for land use categories as articulated in the Noise Element of the City's General Plan. **Table 4.10-2** shows the community noise exposure levels recommended for various types of land use.

Policy NE 1.1 of the General Plan Noise Element, provides:

***NE 1.2 Location of New Residential Development. [GP]*** *Where sites, or portions of sites, designated by the land use element for residential use exceed 60 dBA CNEL, the City shall require measures to be incorporated into the design of projects that will mitigate interior noise levels and noise levels for exterior living and play areas to an acceptable level. In the event that a proposed residential or mixed-use project exceeds these standards, the project may be approved only if it would provide a substantial benefit to the City, including, but not limited to, provision of affordable residential units. Mitigation measures shall reduce interior noise levels to 45 dBA CNEL or less, while noise levels at exterior living areas and play areas should in general not exceed 60 dBA CNEL and 65 dBA CNEL, respectively.*

The above policy and criteria in the Noise Element establish that 60 dBA is the maximum exterior CNEL (or Ldn) that is normally compatible with residential development. This limit may be extended up to 65 dBA if noise mitigation features are included within project designs.<sup>8</sup> With respect to interior noise levels in residences, the 45 dBA threshold set forth in the above policy reflects the identical standard in the California Building Code that applies to multifamily residences (Title 24 Code of California Regulations Sections Section 1207.11.12).

The exterior and interior noise standards are consistent with one another since normal wood frame residential construction usually provides from 12 to 18 dBA of reduction from exterior to interior areas, and 20 dBA is commonly achieved in modern structures that meet current energy conservation requirements. An older guidance document by the U.S. Environmental Protection

<sup>8</sup> City of Goleta General Plan, 2006, Table 9-2.



Agency indicates a reduction ranging from 12 to 17 dBA with windows open, and 24 to 27 dBA with windows closed. Recent field measurements at an apartment complex with construction very similar to Willow Springs showed an exterior-to-interior noise reduction of 19.7 dBA with windows open in an unfurnished bedroom.<sup>9</sup> Thus, an exterior Ldn of 65 dBA will usually provide an interior Ldn of 45 dBA with current construction techniques and materials. The state standards also require an acoustical analysis for all multi-family units located in areas where the Ldn exceeds 60 dBA, in order to demonstrate that the interior standard will be met.

**Table 4.10-2**  
**City of Goleta Land Use Compatibility Criteria**

Land Use	Community Noise Exposure (Ldn or CNEL, dBA)			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Single Family, Duplex, Mobile Homes	50-60	60-65	65-75	75-85+
Multi-Family Homes	50-60	60-65	65-75	75-85+
Schools, Libraries, Churches, Hospitals, Nursing Homes	50-60	60-65	65-80	80-85+
Transient Lodging: Motels, Hotels	50-65	65-70	70-80	80-85+
Auditoriums, Concert Halls, Amphitheaters	-	50-65	-	65-85+
Sports Arena, Outdoor Spectator Sports	-	50-70	-	70-85+
Playgrounds, Neighborhood Parks	50-70	-	70-75	75-85+
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50-70	-	70-80	80-85+
Office Buildings, Business and Professional Commercial	50-67.5	67.5-75	75-85+	-
Industrial, Manufacturing, Utilities, Agriculture	50-70	70-75	75-85+	-

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

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

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

**Clearly Unacceptable:** New construction or development should generally not be undertaken.

Source: Goleta General Plan/Coastal Land Use Plan, October, 2006.

### 4.10.2 Thresholds of Significance

Based on CEQA Appendix G and the City of Goleta's *Environmental Thresholds and Guidelines Manual*, Section 12 Noise Thresholds, the following thresholds are used to determine whether significant noise impacts would occur.

- a. A development that would generate noise levels in excess of 65 dBA CNEL and could affect sensitive receptors would generally be presumed to have a significant impact.

<sup>9</sup> Revised Community Noise Analysis for Willow Springs Phase II, URS Corporation, June 2010.

- 2b. Outdoor living areas of noise sensitive uses that are subject to noise levels in excess of 65 dBA CNEL would generally be presumed to be significantly impacted by ambient noise. A significant impact would also generally occur where interior noise levels cannot be reduced to 45 dBA CNEL or less.
- 3c. A project would generally have a significant effect on the environment if it would increase substantially the ambient noise levels for noise sensitive receptors in adjoining areas. Per Threshold 4—"a" above, this may generally be presumed to occur when ambient noise levels affecting sensitive receptors are increased to 65 dBA CNEL or more. However, a significant affect may also occur when ambient noise levels affecting sensitive receptors increase substantially but remain less than 65 dBA CNEL, as determined on a case-by-case level.
- 4d. Noise from grading and construction activity proposed within 1,600 feet of sensitive receptors, including schools, residential development, commercial lodging facilities, hospitals or care facilities, would generally result in a potentially significant impact. According to USEPA guidelines, the average construction noise is 95 dBA at a 50-foot distance from the source. A 6 dB drop occurs with a doubling of the distance from the source. Therefore, locations within 1,600 feet of the construction site would be affected by noise levels over 65 dBA. Construction within 1,600 feet of sensitive receptors on weekdays outside of the hours of 8 a.m. to 5 p.m. and on weekends would generally be presumed to have a significant effect. Noise attenuation barriers and muffling of grading equipment may also be required. Construction equipment generating noise levels above 95 dBA may require additional mitigation.

With regard to Threshold (c)—3, the term "substantial increase" is not defined within the Thresholds Manual. The limits of perceptibility by ambient grade instrumentation (sound meters) or by humans in a laboratory environment is around 1.5 dB. Under ambient conditions, people generally do not perceive that noise has clearly changed until there is a 3 dB difference. A threshold of 3 dB is commonly used to define "substantial increase." Therefore, for purposes of this analysis, an increase of +3 dBA CNEL in traffic noise would be considered a significant impact. Increases of +3.0 dB require a doubling of traffic volumes on already noise-impacted roadways. Development projects usually do not, of themselves, cause traffic volumes to double. Offsite traffic noise impacts are therefore almost always cumulative in nature rather than individually significant.

### 4.10.3 Project Impacts

Potential noise issues associated with operation of the project include the suitability of the noise environment for the project's use and the increases in area-wide noise levels due to project generated noise, which would primarily results from the project's traffic generation. Construction activities, especially heavy equipment, can create short-term noise increases near a project site. Such impacts may be important for nearby noise-sensitive receptors such as any existing residential uses. Each of these potential impacts is discussed below.

#### Construction Period Noise<sup>10</sup>

Noise levels from heavy equipment used for earth moving during construction typically range from 80-90 dBA at distances of 50 feet. An assumption of 95 dBA at 50 feet is used in the City's *Environmental Thresholds and Guidelines Manual* to define areas of potential impact. Based on this assumption, any sensitive receptor, such as residences within 1,600 feet of a construction

<sup>10</sup> Addresses Thresholds "a", "c", and "d".

site, may be subject to significant noise impacts.

The entire existing Willow Springs I residential community is within 1,600 feet of the project site. There are also apartments and a portion of Los Carneros County Park on the north side of Highway 101 within this distance, but the intervening freeway represents a more dominant noise source. All remaining areas within 1,600 feet of the project site are either vacant land or developed with industrial and office uses. Thus, the major areas where construction noise may represent an impact are within the Willow Springs I development. Residents, particularly those along the north perimeter adjacent to the project site, may be subject to construction noises ranging up to 95 dBA at least for short periods of time. Even though construction noise is a common and expected occurrence, the proximity of residents to the south to ongoing construction warrants measures to help minimize the potential for noise impacts from this source. Therefore, construction-period noise impacts are expected to be **potentially significant (Impact N 1)**.

## On-site Noise Exposure<sup>11</sup>

### *Roadway Traffic*

As shown in Figure 4.10-1, noise measurement locations were selected to represent the corner of each of the northernmost buildings in the project site plan closest to roadway noise sources. Remaining portions of these buildings, and the other buildings within the project, would all be farther from the roadways and partially shielded from that noise by structures within the project. At each modeled receiver location, two points were identified: (1) one at a height of about 5 feet above the first floor elevation, and (2) a second point five feet above the second story floor level.

As described above, traffic noise affecting the project site originates primarily from Los Carneros Road and the southbound on-ramp to U.S. Highway 101 from Los Carneros Road. Traffic on the highway itself contributes a lesser amount of noise. These three sources were modeled first with data and estimates of current hourly traffic volumes, and then with estimates of average daytime and nighttime hourly traffic volumes for both current and future conditions. The extension of Camino Vista was included in the future modeled conditions.

Current Average Daily Traffic (ADT) volumes were obtained from Caltrans for both the highway and the southbound on-ramp. The current and future ADT values for Los Carneros Road were obtained from the project traffic report.<sup>12</sup> Estimates of noise from future traffic along the extension of Camino Vista were developed based on projected future cumulative traffic levels along this road and the estimated percentage of truck traffic, which is based on observations in the area. An estimate of the future volume on the southbound on-ramp and on Highway 101 was obtained by projecting a 2.4 percent per year increase to the year 2024. This is the average of the annual rates of increase on the highway from 1998 through 2007. If traffic volumes are lower during the recession period, this long-term projection allows for a reasonable maximum potential approach as it follows an average trend.

Estimates of the hourly traffic volume, by each vehicle type, were made using the present and future ADT volumes, and the assumptions shown in Appendix G, Table B-1 of the Revised Community Noise Analysis for Willow Springs Phase II (see Appendix G). The 24-hour day was divided into two periods: daytime, from 7:00 a.m. to 10:00 p.m., and nighttime, from 10:00 p.m.

<sup>11</sup> Addresses Threshold “b”.

<sup>12</sup> Associated Transportation Engineers (ATE) Table 1 and Table 8, provided in Appendix G.

to 7:00 a.m. The ADT value was split as follows: 85 percent for the daytime, and 15 percent for the nighttime. The percentages for automobiles, medium duty trucks, and heavy-duty trucks were determined from the traffic counts conducted during the noise monitoring for Los Carneros Road (used for that roadway and for the southbound on-ramp), or data from Caltrans for Highway 101.

The current and future roadway traffic noise levels were computed separately as Leq values for the daytime hours and for the nighttime hours. These values were then combined to yield the Day-Night Equivalent Noise Level or Ldn. In computing the Ldn, an extra 10 dBA "penalty" is added to the nighttime Leq values to account for the added nuisance of noise during this time.

The calculation uses the following equation:

$$Ldn = 10 \cdot \log\left\{\left(\frac{1}{24}\right) \cdot \left[15 \cdot 10^{Ld/10} + 9 \cdot 10^{(Ln+10)/10}\right]\right\}$$

Where:

Ldn = Day-Night Average Noise Level

Ld = Hourly equivalent noise level for hours during the daytime

Ln = Hourly equivalent noise level for hours during the nighttime

Results of this computation for current and future noise levels are shown summarized in Table 4.10-3 below.<sup>13</sup>

**Table 4.10-3**  
**Summary Traffic Noise Projections**

Receiver Location	Description	Ldn (dBA)	
		Current	Future
27-1	Bldg. 27, NW corner ground floor	51.1	57.3
27-2	Bldg. 27, NW corner, second story	53.5	58.1
28-1	Bldg. 28, NW corner, ground floor	51.8	57.4
28-2	Bldg. 28, NW corner, second story	54.3	58.4
29-1	Bldg. 29, NW corner, ground floor	52.8	57.8
29-2	Bldg. 29, NW corner, second story	55.3	59.0
30-1	Bldg. 30, NW corner, ground floor	52.5	57.2
30-2	Bldg. 30, NW corner, second story	55.4	58.7
M2-1	40' from Camino Santa Fe CL, ground level	52.9	59.3
M2-2	40' from Camino Santa Fe CL, 10' above ground	55.9	60.5
31-1	Bldg. 31, NE corner, ground floor	52.7	57.0
31-2	Bldg. 31, NE corner, second story	55.6	58.6

Roadway noise levels at the building locations will remain below the 60 dBA Ldn value, which is considered normally acceptable for residential uses. The noise reading at monitoring point M2-2, was slightly above 60 dBA; however, the nearest building would be an additional 20 feet away, which would yield a value lower than 60 dBA. All residential buildings, outdoor living areas, trails and facilities within the boundaries of the project would be subject to current and future traffic noise levels that would not exceed City thresholds. Thus, potential noise compatibility impacts associated with surrounding roadway noise would be less than significant.

<sup>13</sup> Full computation results for current and future noise levels are shown in Appendix B, Table B-2 of the Revised Community Noise Analysis for Willow Springs Phase II, June 2010. Appendix G of this report.

As described below, traffic along Camino Vista (including potential through truck traffic from the existing development east of the project site) would not change this result.

### Aero Camino Industrial Area Noise

Land to the east of the project site is zoned M-1, Light Industry, and is currently developed with such uses. Section 35-85.7 of the City Zoning Regulations sets forth performance standards for such uses in the M-1 zone, and requires: The volume of sound, measured during calm air conditions, inherently and recurrently generated by or resulting from any use, other than motor vehicles, operated on any lot shall not exceed seventy (70) decibels at any point along the boundary or outside of the lot upon which such use is located. It is possible that tenants of the industrial buildings may have different uses, equipment needs, and varying hours of operations that may change in the future.

Noise levels from the industrial uses to the east of the project site are currently well below the noise performance standard in the M-1 zone, and do not contribute significantly to noise on the project site. The current Leq value at the property line during measurements at point M1 was 52.6 dBA (Section 2.2.2 above). This current noise source would not result in a significant impact on the project uses.

### Noise Exposure from Combined Sources

The primary sources of noise affecting the property are very different in nature. Roadway noise is generally constant in the background, while railroad noise is distinctly episodic. The difference leads to one of the dilemmas in analyzing community noise impacts, since some standards (Noise Element) are more suitable for longer-term noise while others (Zoning) are developed to address short-term and peak noise levels. The use of CNEL or Ldn to establish noise standards or thresholds is a compromise in this respect. This type of 24-hour average noise level is effective for characterizing more or less continuous noise sources, such as traffic.

When noise events are discrete and episodic in nature, it is still possible to compute a 24-hour average based on the loudness of individual events and their number of occurrences during a day. The result, however, is less accurate in predicting the response of people or the annoyance of individual noise events. Nevertheless, CNEL and Ldn have become the most widely used descriptors or metrics for community noise and they form the basis for almost all noise standards used in General Plan Noise Elements and in many other regulatory programs.

The City Noise Element suggests that the combined effect of the railroad and highway is to create a corridor up to 600 feet wide within which noise levels exceed 70 dBA, and a corridor three times that width where noise levels exceed 65 dBA.<sup>14</sup> If true in all cases, this would mean the 65 dBA contour would extend 900 feet into the property. This generalization is overly conservative for a number of reasons, and is greatly influenced by a number of factors and uncertainties.

It is possible to add noise levels from the highway and railroad tracks mathematically, but in the real world one or the other will dominate. Because of the logarithmic definition of decibels, two identical continuous noise levels from identical sources when added together will have a result that is 3 dBA above their value. As the difference in magnitude between the two noise sources becomes greater, the louder source dominates. When the difference approaches 10 dBA, there

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<sup>14</sup> City of Goleta General Plan, Noise Element, 2006, Page 9-3.

is virtually no contribution from the smaller noise source. If one were standing at a point on the railroad 70 dBA CNEL contour (about 100 feet from the tracks), one would only hear highway noise most of the time (about 67 dBA CNEL). Then when a train passes by, the noise level would rise to a peak between 95 and 100 dBA, at which point highway noise would be indiscernible. The “sum” of the two CNEL values at this point (70 dBA plus 67 dBA) would be 72 dBA.

The roadway noise, which is more or less continuous along the linear direction of the highway, drops off at a theoretical rate of 3 dBA per doubling distance as one moves farther away from the travel corridor. The railroad noise, however, is much less “linear” and drops off at a faster rate. For a theoretical point source, the decrease is 6 dBA per doubling distance. The combination of this disparity in distance attenuation with the logarithmic nature of noise addition causes the railroad noise to dominate when close to the tracks and the highway noise to dominate when farther away from the tracks. The crossover point, where the two sources would theoretically have the greatest additive effect is about 200 feet. In reality the highway is not a perfect linear source and the railroad is not a perfect point source. Topography and the nature of the ground surface also affect the transmission of noise and pose additional uncertainties in this discussion—for the Willow Springs Phase II site, the highway itself is not the main roadway noise source. People respond differently to different types of noise sources. For these reasons, care must be exercised in any discussion that is based on a simple theoretical or mathematical analysis of diverse noise sources. With this caution in mind, the following paragraphs address the combination of noises from different sources.

Using results estimated for point 30-2 (the second story elevation at Building 30), which is the residential building most exposed to the highway and railroad tracks, the additive effect of the railroad CNEL (60 dBA) and the future Ldn for the highway (58.7 dBA) gives a resulting 24-hour average noise level of 62.4 dBA. This combined noise level is well below the 65 dBA conditionally acceptable threshold for residential uses.

If one considers an additional contribution from aircraft over-flights, this conclusion will not be changed. The project is well outside of the 60 dBA CNEL contour for the Santa Barbara Airport, and a reasonable estimate for the CNEL at point 30-2 is about 55.9 (see above). Adding this to the previous cumulative sum of 62.4 dBA yields a new cumulative total of 63.3 dBA—still comfortably below the 65 dBA threshold. As one moves south into the project site, the aircraft noise may be slightly higher (but still well below 60 dBA), but the highway and railroad noise will become lower.

Finally, even if one considers an additional contribution from the industrial uses immediately to the east, the effect is to add just a few tenths of a decibel bringing the resulting Ldn to about 63.6 dBA. The industrial activities, however, do not currently continue throughout the night and this result does not account for any distance attenuation. As such, this contribution is considered a conservative (“high”) estimate.

To summarize this discussion, even if it were appropriate to add all of the different noise sources together the resulting Ldn would be below the 65 dBA conditionally acceptable threshold for residential uses. This “total” effect would only occur at the northeastern corner of the project site. Moving south and west into the project site, there may be a very slight increase in aircraft noise but the highway and railroad noise would drop off by greater amounts.

### Project Outdoor Areas Noise Exposure

All residences would be located in areas where the future Ldn will be below 65 dBA. However, the northern facades of Buildings 30 and 31 (shown in Figure 4.10-1) have private outdoor living spaces where the City's General Plan standard of 60 dB Ldn may be exceeded from combined roadway traffic, trains, airport, and industrial activity sources. As the Willow Springs North property is designated for residential uses, future development of buildings could attenuate noise reaching the Willow Springs II property (such as US 101 noise); however, empirical assumptions cannot be made as they would depend on the site plan layout, and no application has been submitted for processing at this time. Also, it is possible that combined noise could increase in the future should airport traffic increase, the industrial uses to the east generate higher than expected noise levels, or higher than expected traffic volume occurs on the Camino Vista Road extension. Impacts from noise exposure within the outdoor living spaces ~~along on~~ the north facing side of the ~~Buildings 30 and 31 residences~~ is considered **potentially significant (Impact N 2)**.

### Project Indoor Areas Noise Exposure

Assuming conventional wood frame construction consistent with current California energy conservation requirements, all interior living spaces are expected to have Ldn values of 45 dBA or less. Construction of multi-family residences must comply with the California Building Code as adopted by the City in Title 15 of the Goleta Municipal Code, which requires documentation that interior standards will be met as part of an acoustical report submitted during plan check for a building permit. The acoustical report would specify any required noise attenuation features that would be included in the building design. If window closure is required to meet interior standards, the code requires provision of supplemental fresh air ventilation air in any affected livable space. That same report must document that the building code requirement of a sound transmission class (STC) or 50 or better would be met in any shared ("party") wall assemblies. Stacked units must also have a floor/ceiling assembly rated at STC=50 or better, and also an impact isolation class (IIC) rating of 50 or better. Based on the noise exposure measurements being acceptable and building construction standards that would reduce interior noise, impacts related to noise on the interior of the residences is considered less than significant.

As provided above, the noise analysis assumes a conservative (worst-case) percentage of truck traffic on road for daytime and nighttime hours. In the event there are non-conforming uses in the adjacent Aero Camino industrial area that operate during nighttime hours and create truck traffic along Camino Vista Road, the events would be discrete and episodic in nature and create individual noise annoyances, for which impacts are not necessarily evident in a 24-hour average measurement based on CNEL or Ldn standards. However, the project impact ~~on~~ indoor noise exposure would be less than significant based on established thresholds and standards for measurement.

## **Project Generated Noise<sup>15</sup>**

### *Project Traffic Noise*

Project generated traffic would be added to the local roadway system. At each turning opportunity, the project contribution to the total traffic volume would be progressively diluted. Closest to the project site, 672 daily trips would be added to existing low traffic volumes on Camino Vista, Calle Koral, and Los Carneros Way. Although there may be a detectable

<sup>15</sup> Addresses Thresholds "a" and "c".

increase in traffic noise, with-project traffic noise levels would be below the most stringent City noise planning standard of 60 dB Ldn. Along Camino Vista and Calle Koral, as the primary project access roadways, the following traffic noise levels are calculated for a 25 mph travel speed (dB Ldn at 50 feet from the centerline):

Existing - No Project	= 54.1 dB
Existing - With Project*	= 55.5 dB
Cumulative – No Project*	= 59.5 dB
Cumulative - With Project*	= 59.9 dB

\* Without diverted through traffic on the Aero Camino extension

Project traffic would not create any zone of noise incompatibility, or create any clearly perceptible noise increase (+3 dB is typically considered a clearly noticeable increase).

Along more heavily traveled roadways such as Hollister Avenue or Los Carneros Road, existing baseline noise levels are much higher. However, this elevated baseline would mask any small project increment. For example, traffic noise along Los Carneros Road without and with project traffic would change by an imperceptible amount as follows (dB Ldn at 50 feet to centerline 45 mph travel speed):

Roadway	Existing		Cumulative	
	No Project	With Project	No Project	With Project
<b>S of 101 Ramps</b>	71.27	71.35	72.25	72.31
<b>S of Hollister</b>	69.66	69.69	70.58	70.61

Note: Modeling accuracy does not extend to the nearest 0.01 dB, above values are shown to two decimal places to demonstrate that all project impact increments are less than 0.1 dB.

The Camino Vista Road extension would provide an alternative (shorter) route from industrial park traffic to the on/off ramps at U.S. Highway 101 and Los Carneros Road. The possibly diverted traffic may contain a higher percentage of heavier, noisier trucks than the traffic using the road to access the project site. The supplemental traffic analysis conducted by LLG predicts that 16 ADT of the estimated Camino Vista 300 ADT would be heavy (3 or more axle) trucks. These were assumed to be 2 ADT before 7 a.m. and 14 after 7 a.m. The net change in the daily Ldn associated with truck traffic is as follows at 50 feet from the Camino Vista centerline:

Existing - No project – No extension	= 54 dB
Existing - With project – Without diverted through traffic	= 55 dB
Existing - With project – With diverted through traffic	= 57 dB
Cumulative – No project – With diverted through traffic	= 60 dB
Cumulative - With project – With diverted through traffic	= 60 dB

The addition of diverted traffic, including any industrial park trucks, would not create near-term or build-out noise levels exceeding the most stringent City residential compatibility standard of 60 dB Ldn beyond 50 feet from the Camino Vista centerline.

Impacts to the community from project generated traffic noise would be less than significant.



#### 4.10.4 Cumulative Impacts<sup>16</sup>

The potential for cumulative noise impacts is associated with traffic increases that would occur as a result of the project in combination with other projects in the area. The analysis of traffic noise above considers future year traffic volumes, which ~~that~~ includes this combined traffic generation. Allowing for an analysis of a reasonable maximum potential scenario, projected future traffic levels (and related noise) are based on average growth rates; and would therefore, not be based on any artificially low rates that might occur during a single current measurement event. As shown in the above traffic calculations, cumulative traffic increases may cause noise levels to increase from 54 to 60 dB on local roads with existing low traffic volumes (i.e., Camino Vista, Calle Koral, and Los Carneros Way). Because noise levels on these roads would not exceed 65 dB, a significant cumulative noise impact would not occur. In addition, noise levels with and without the project in the cumulative (buildout year) analysis would be essentially the same.

#### 4.10.5 Mitigation Measures

##### Construction Noise Impact (Impact N 1)

**N 1-1** All noise-generating project grading/construction activities (including any demolition) shall be limited to Monday through Friday, 8:00 a.m. to 5:00 p.m. Construction shall generally not be allowed on weekends and state holidays. Exceptions to these restrictions may be made in extenuating circumstances (in the event of an emergency, for example) on a case-by-case basis at the discretion of the Director of Planning and Environmental Services. The permittee shall post the allowed hours of operation near the entrance to the site, so that workers onsite are aware of this limitation.

**Plan Requirements and Timing:** Three (3) signs stating these restrictions shall be provided by the permittee applicant and submitted to the City for review and approval prior to issuance of any Land Use Permit for grading. Upon approval, the permittee shall ensure that all three (3) signs are posted onsite. Such signs shall be a minimum size of 24" x 48." All such signs shall be in place prior to commencement of any grading/construction and maintained through occupancy clearance. Violations may result in suspension of permits.

**Monitoring:** City staff shall monitor compliance with restrictions on grading/construction hours and shall investigate and respond to all complaints.

**N 1-2** Stationary construction equipment that generates noise which exceeds 65 dB(A) measured 50-feet from the source in an un-attenuated condition shall be shielded to reduce such noise levels to no more than 65 dB(A) at project boundaries.

**Plan Requirements and Timing:** The permittee shall submit to the City a list of all stationary equipment to be used in project construction which includes manufacturer specifications on equipment noise levels as well as recommendations from the project acoustical engineer to shielding such stationary equipment so that it complies with this requirement. This information shall be reviewed and approved by City staff prior to any LUP issuance for

<sup>16</sup> Addresses Thresholds "a" and "c".

grading and any LUP issuance for construction. All City approved noise attenuation measures for stationary equipment used in any construction and/or demolition activities shall be implemented and maintained for the duration of the period when such equipment is onsite.

**Monitoring:** City staff shall periodically inspect the site to ensure compliance with all noise attenuation requirements.

### N 1-3

The following measures shall be incorporated into grading and building plans:

- a. The access point for construction and staging activities shall be located off of Camino Vista, away from existing residences adjacent to that road.
- b. Dirt hauling past existing Willow Springs I residences shall not occur on Saturday, Sunday, and state holidays.
- c. All construction equipment shall have properly maintained sound-control devices, and no equipment shall have an un-muffled exhaust system.
- d. The permittee shall ensure that all cContractors shall implement appropriate additional noise mitigation measures including but not limited to changing the location of stationary construction equipment, shutting off idling equipment, and installing acoustic barriers around significant sources of stationary construction noise.

**Plan Requirements and Timing:** These requirements shall be printed on all plans prior to any LUP issuance for grading and any LUP issuance for construction. Requirements shall also be printed on grading and building permits.

**Monitoring:** City staff shall periodically inspect the site to ensure compliance with all noise attenuation requirements.

## Exterior Noise at North-Facing Outdoor Living Spaces (Impact N 2)

### N 2-1

North-facing balconies or patios on ~~buildings~~ Building Nos. 30 and 31 adjacent to Camino Vista Road shall have solid perimeter barriers to a height of ~~4.5~~ 5.5 feet above the deck to mitigate overall noise to below the 60 dB Ldn standard, ~~except that the permittee may prepare and submit an acoustic study, subject to review and approval by the City, which demonstrates to the satisfaction of the City that noise levels on the north facing balconies and patios for Building Nos. 30 and 31 can be reduced to below the 60 dB Ldn standard with a shorter perimeter barrier and/or through other noise mitigating measures approved by the City.~~

**Plan Requirements and Timing:** Any acoustic study prepared by the permittee shall be submitted to the City for review and approval prior to issuance of any Land Use Permit for construction. These City approved noise mitigating requirements shall be incorporated into all plan sets submitted for issuance approval of any Land Use Permit for construction, building, or grading permits prior to permit approval.

**Monitoring:** City staff shall verify compliance prior to issuance of any Land Use Permit for construction approval. City building inspectors shall spot check to ensure compliance in the field.

#### **4.10.6 Residual Impacts**

With implementation of mitigation measures N 1-1, N 1-2, and N 2-1 described above, the project's impacts would be reduced to **less than significant (Class II)**.