

NOISE ASSESSMENT

**Smilax Townhome Project
PDS2019-TM-5634
ENVIRONMENTAL LOG NO.: PDS2019-ER-19-08-002
County of San Diego, CA**

Lead Agency:

**County of San Diego
Planning & Development Services
Contact: Souphie Sakdarak
5510 Overland Avenue #110
San Diego, CA 92123
858-495-5214**

Prepared by:

**Jeremy Loudon
Ldn Consulting, Inc.
42428 Chisolm Trail
Murrieta, CA 92562
780-473-1253**

Prepared For:

**KB Home Coastal
9915 Mira Mesa Boulevard, Suite 100
San Diego, CA 92131**

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GLOSSARY OF COMMON TERMS

Sound Pressure Level (SPL): a ratio of one sound pressure to a reference pressure (L_{ref}) of 20 μ Pa. Because of the dynamic range of the human ear, the ratio is calculated logarithmically by $20 \log (L/L_{ref})$.

A-weighted Sound Pressure Level (dBA): Some frequencies of noise are more noticeable than others. To compensate for this fact, different sound frequencies are weighted more.

Minimum Sound Level (L_{min}): Minimum SPL or the lowest SPL measured over the time interval using the A-weighted network and slow time weighting.

Maximum Sound Level (L_{max}): Maximum SPL or the highest SPL measured over the time interval the A-weighted network and slow time weighting.

Equivalent sound level (L_{eq}): the true equivalent sound level measured over the run time. L_{eq} is the A-weighted steady sound level that contains the same total acoustical energy as the actual fluctuating sound level.

Day Night Sound Level (LDN): Representing the Day/Night sound level, this measurement is a 24 –hour average sound level where 10 dB is added to all the readings that occur between 10 pm and 7 am. This is primarily used in community noise regulations where there is a 10 dB “Penalty” for nighttime noise. Typically, LDN’s are measured using A weighting.

Community Noise Exposure Level (CNEL): The accumulated exposure to sound measured in a 24-hour sampling interval and artificially boosted during certain hours. For CNEL, samples taken between 7 pm and 10 pm are boosted by 5 dB; samples taken between 10 pm and 7 am are boosted by 10 dB.

Octave Band: An octave band is defined as a frequency band whose upper band-edge frequency is twice the lower band frequency.

Third-Octave Band: A third-octave band is defined as a frequency band whose upper band-edge frequency is 1.26 times the lower band frequency.

Response Time (F,S,I): The response time is a standardized exponential time weighting of the input signal according to fast (F), slow (S) or impulse (I) time response relationships. Time response can be described with a time constant. The time constants for fast, slow and impulse responses are 1.0 seconds, 0.125 seconds and 0.35 milliseconds, respectively.

EXECUTIVE SUMMARY

This noise study has been completed to determine the noise impacts associated with the development of the proposed project. The project known as "Smilax Residential" envisions providing a total of 62 attached condominiums on approximately 4.9 acres located at 425 Smilax Road (APN 217-191-02) and the parcel adjacent to the south (APN 217-191-03) in the North County Metropolitan Subregional Plan Area within unincorporated San Diego County. The project site is located on the west side of Smilax Road roughly 600 feet south of the intersection of Mimosa Avenue and Smilax Road.

Project design features (PDFs) have been included in this Project. The applicant has agreed to implement all PDFs and will be included as part of the Project's Conditions of Approval. The following PDFs applied in this analysis with the purpose of reducing noise include:

1. Installation of a six-foot high solid perimeter and side yard fencing
2. Provide a noise protection easement over the entire site to require the implementation of building design and construction measures to ensure that interior noise levels do not exceed 45 CNEL.

On-Site Traffic Noise Analysis

It was determined from the analysis that the Noise Sensitive Land Use (NSLU) areas are shielded by the proposed solid side yard fences and solid perimeter fencing, six (6) feet in height. The solid fencing will be vinyl, $\frac{3}{4}$ -inch or thicker consisting of solid panels on minimum 4x4-inch posts with no cracks or gaps through or below and all seams or cracks will be filled or caulked. The proposed fencing will break the line of sight to the roadways and provide a 5 to 8 decibel reduction. Therefore, the noise levels at the NSLU adjacent to the roadways will be reduced to 65 dBA CNEL or less. Based on the findings, outdoor NSLU areas are anticipated to be below the County of San Diego 65 dBA CNEL threshold with the perimeter fencing and no additional exterior analysis is required.

The County of San Diego as part of its noise guidelines also states, consistent with Title 24 of the California Code of Regulations (CCR), a project is required to perform an interior assessment on the portions of a project site where building façade noise levels are above the normally compatible noise level in order to ensure that acceptable interior noise levels can be achieved. Building facades could be as high as 70 dBA CNEL at 50 feet and the 60 dBA CNEL contours from Smilax Road and Poinsettia Avenue could extend 232 and 237 feet from the center lines at the first floor level, respectively. The second floor level 60 dBA CNEL contours encompass the entire site. Therefore, per the General Plan Noise Element, a noise protection easement is required for the entire site. The noise protection easement will require that the implementation of building design and construction measures to ensure that interior noise levels do not exceed 45 CNEL.

An interior noise study is required for those units located in the noise easement to determine the mitigation required to achieve an interior noise level of 45 dBA CNEL. This report would finalize the noise requirements based upon precise grading plans and actual building design specifications. This is to ensure that interior noise levels for the proposed residential structures comply with the interior noise level requirement of 45 dBA pursuant to the County Noise Element. It should be noted; interior noise levels of 45 dBA CNEL can be obtained with conventional building construction methods, for example by providing-mechanical ventilation (e.g. air conditioning) and/or providing upgraded windows at all affected residential units.

Off-Site Traffic Noise Analysis

The project does not create a direct impact of more than 3 dBA CNEL on any roadway segment. Therefore, the proposed project's direct contributions to off-site roadway noise increases will not cause any significant impacts to any existing noise sensitive land uses. Cumulative off-site roadway noise increases would not result in significant impacts to existing noise sensitive land uses. Therefore, no offsite Project related traffic noise impacts are anticipated from the Project's cumulative contributions.

Operational Noise

Mechanical equipment (HVAC) and normal residential activities are anticipated to comply with the County's Noise Ordinance 36.404. Therefore, no impacts will occur and no mitigation is needed for the project operations to comply with the County's standards and no impacts are anticipated and no mitigation is required.

Construction Noise Analysis

Construction noise levels at an average distance of 150 feet would attenuate or be reduced 9.5 dBA. Given this and the spatial separation of the equipment, the noise levels are projected to comply with the County of San Diego's Noise Ordinance Section 36.409 standard of 75 dBA at all Project property lines and no significant impacts to noise would occur. Additionally, all equipment should be properly fitted with mufflers and all staging and maintenance should be conducted as far away for the existing residence as possible.

No blasting or rock crushing is anticipated during construction. Therefore, no impulsive noise sources are expected and the Project will comply with Section 36.410 of the County Noise Ordinance.

Based on the foregoing and the analysis set forth herein, the proposed project will not generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the County General Plan or applicable noise ordinance or applicable standards of other agencies.

Vibration Analysis

There are no existing or proposed frequent activities on or near the proposed project site which would cause any significant vibration levels to existing buildings. The project site is adjacent to roadways and near SR-78. Caltrans has done extensive research on vibration created along freeways/roadways and found that because vehicles are supported by suspension systems and pneumatic tires, these vehicles are not an efficient source of ground vibration (*Source: Transportation and Construction Vibration Guidance Manual, Caltrans 2013*). Therefore, no impacts from excessive groundborne vibration or groundborne noise levels are anticipated.

Airport Noise

The proposed project is not located in the vicinity of a private airstrip; the proposed project is subject to the McClellan-Palomar Airport Land Use Compatibility Plan, but is located 4 miles from the airport. Therefore, is not sufficiently proximate that the project would expose people residing or working in the project area to excessive noise levels.

1.0 INTRODUCTION

1.1 Project Description

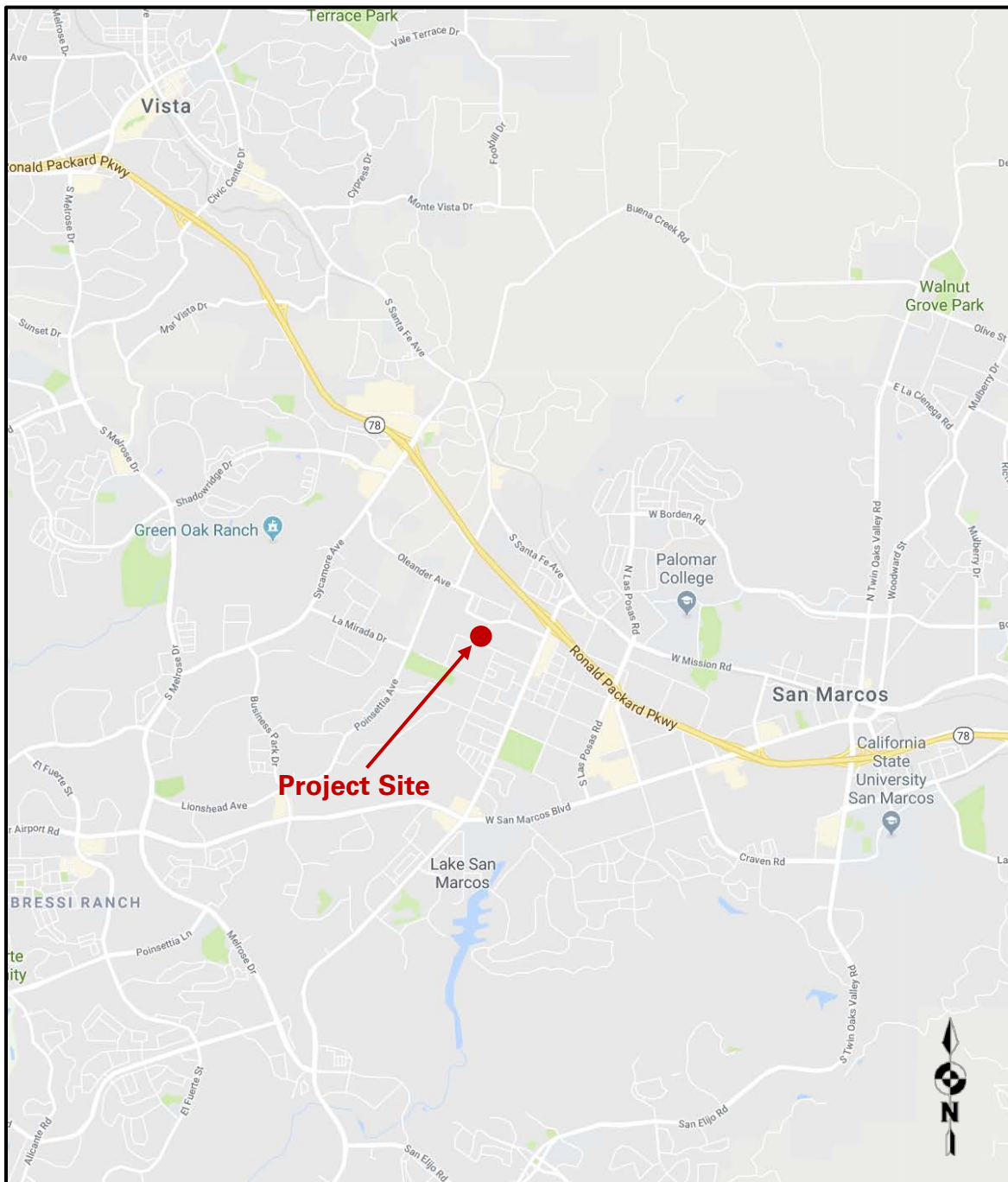
This noise study was completed to determine the noise impacts associated with the development of the proposed Smilax Residential Project. The project is located at 33° 09' 24" N and 117° 12' 32" W, located at 425 Smilax Road (APN 217-191-02) and the parcel adjacent to the south (APN 217-191-03) in the North County Metropolitan Subregional Plan Area within unincorporated San Diego County. A general project vicinity map is shown in Figure 1–A on the following page.

The Project envisions providing 62 multi-family residential units which would be spread among 15 two story buildings. Each building would contain between three and five condominium units and each unit would have a two-car garage. The project would provide a total of 147 parking spaces with 124 garage parking spaces (two per unit) and 23 open parking spaces for use by residents and visitors. Construction of the Project would be expected to begin in 2020 with completion expected in 2021. The proposed Project would include the demolition of a single-family home with a garage which would have a combined area of approximately 2,700 Square Foot (SF). The Project site plan is shown in Figure 1-B.

The project would also include two common open space areas, including a turf dog park in the southeastern corner of the project site and a larger active use area located in the middle of the development. The larger active use area would include a tot lot (play equipment and benches), an open turn play area, a BBQ, and a shaded trellis.

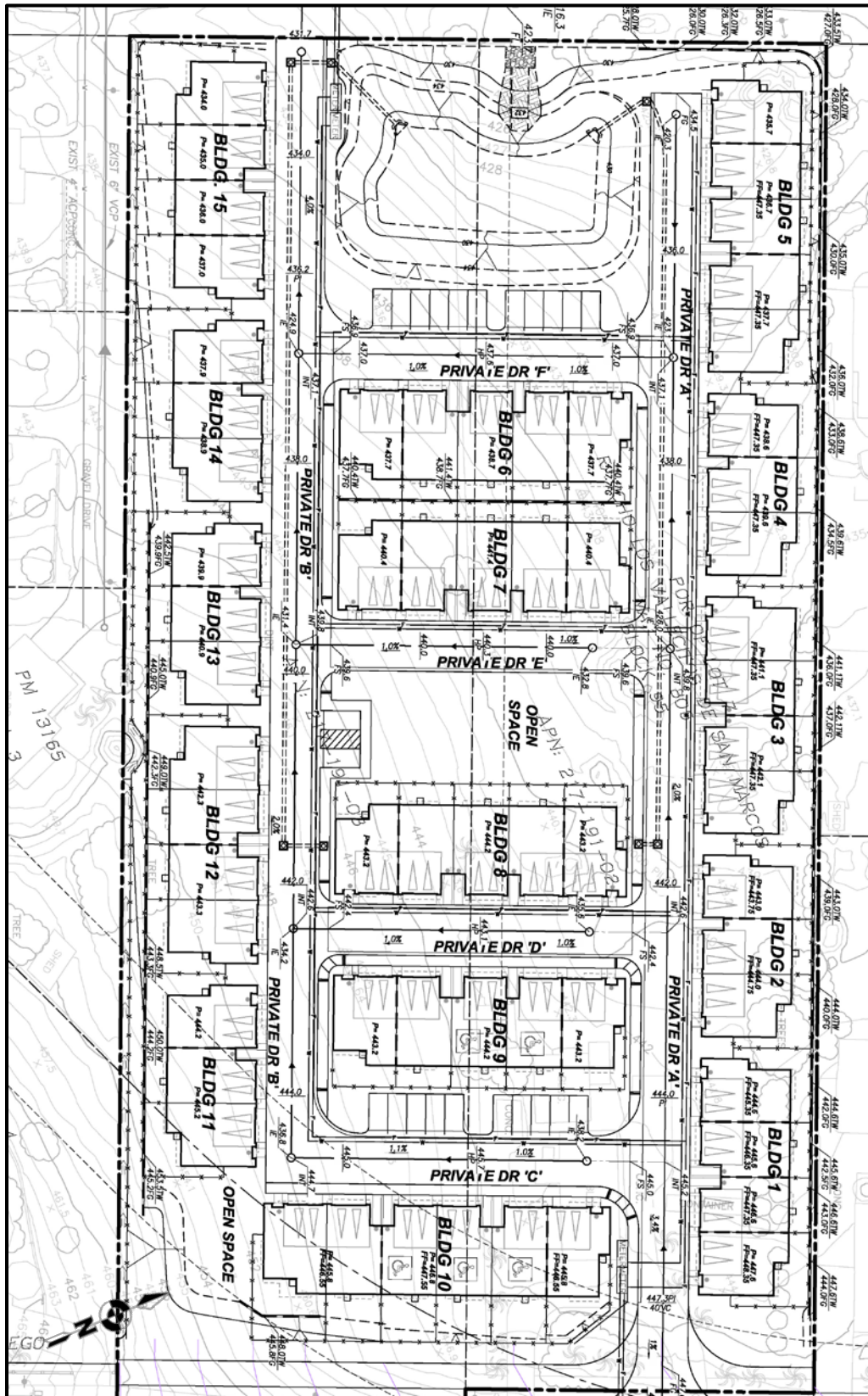
The site is subject to the General Plan Village Regional Category, Village Residential 2 (VR-2) Land Use Designation, and Rural Residential (RR) Zoning Regulation. The project would require a General Plan Amendment (GPA) to amend the General Plan Land Use Designation from VR-2 to Village Residential 15 (VR-15) and to remove Smilax Road from the Mobility Element Road Network. The VR-15 designation would allow for a residential density of 15.0 dwelling units per acre (du/ac). The Mobility Element Road network currently has Smilax Road turning to the southwest from its current alignment through the project site (and through the residential properties to the south). In addition, the project would require a Zoning Reclassification (Rezone) to change the Use Regulation from RR to Multi-Family Residential (RM) and building type from "C"- Single Detached only to "K" to allow for multi dwelling units. The Rezone would also add the "D" Design Review Area Special Area Designator to ensure the proposed structures and development of the site would complement the surrounding areas and existing development pursuant to Section 5900 et. al of the Zoning Ordinance.

Figure 1-A: Project Vicinity Map



Source: Google, 2019

Figure 1-B: Proposed Project Site Layout



Source: Hunsaker and Associates, 2019

1.2 Environmental Settings & Existing Conditions

a) Settings & Locations

The project is located at 425 Smilax Road (APN 217-191-02) and the parcel adjacent to the south (APN 217-191-03) within the unincorporated San Diego County. The site is approximately 500 feet south of State Route 78 (SR-78). Sycamore Avenue to the west and Rancho Santa Fe Road to the east are arterials that connect the project to SR-78. The site is subject to the General Plan Village Regional Category VR-2 Land Use Designation, and RR Zoning Regulations. Land uses surrounding the Project mostly include single family residential. The project is also located adjacent to the Joli Ann Leichtag Elementary School.

b) Existing Noise Conditions

The project is located south of SR-78 which currently is a 6-lane freeway with a posted speed limit of 65 miles per hour (MPH). Smilax Road is classified in the City of San Marcos Mobility Element as a 4-lane arterial. It is currently constructed as a 2-lane undivided roadway. It has a posted speed limit of 35 MPH and parking is permitted along the east curb. Poinsettia Avenue is classified in the San Diego County Mobility Element as a 4-lane arterial. It is currently constructed as a 2-lane undivided roadway. It has a posted speed limit of 40 MPH. Existing noise occurs mainly from background traffic traveling along SR-78 and to a lesser extent from Smilax Road and Poinsettia Road which each have an approximate daily traffic volume of 8,000 ADT according to the Project's Traffic Study (LLG, 2019).

1.3 Methodology and Equipment

a) Noise Measuring Methodology and Procedures

To determine the existing noise environment and to assess potential noise impacts, 24-hour measurements were taken at two locations on the project having a relatively flat terrain and no obstruction from trees or structures. The noise measurements were recorded on July 10th-11th, 2018 by Ldn Consulting between approximately 4:00 p.m. and 4:00 p.m. the following day. Noise measurements were taken using two Larson-Davis Spark Model 706 Type 2 precision sound level meters, programmed, in "slow" mode, to record noise levels in "A" weighted form. The sound level meter and microphone were mounted on a tripod, five feet above the ground and equipped with a windscreen during all measurements. The sound level meter was calibrated before and after the monitoring using a Larson-Davis calibrator, Model CAL 200.

The overall results of the noise level measurements are presented in Table 1-1. The ambient Leq noise levels measured at the project were found to be roughly 59-61 dBA due to background noise from SR-78. As can be seen in the table, 50% (L50) of the time the noise levels were

below 48 dBA and 90% (L90) the noise levels were below 40 dBA. Table 1-2 provides the hourly noise levels along with the average and CNEL values. The noise measurement locations were determined based on site access and noise impact potential to the proposed sensitive uses. Monitoring location 1 (M1) was located adjacent to Poinsettia Avenue and monitoring location 2 (M2) was located adjacent to Smilax Road. The noise monitoring locations are provided graphically in Figure 1-C on the following page.

Table 1-1: Overall Existing Noise Levels

Location	Hour Noise Levels (dBA)					
	Leq	Lmin	Lmax	L10	L50	L90
M1	50.4	34.7	91.8	54.5	47.0	39.0
M2	57.0	33.6	91.1	62.0	47.5	39.0

Table 1-2: Long-Term Noise Level Summary

Monitoring Location 1	dBA L _{eq}	Monitoring Location 2	dBA L _{eq}
4:00 PM	46.6	4:00 PM	57.7
5:00 PM	47.6	5:00 PM	58.2
6:00 PM	46.2	6:00 PM	59.0
7:00 PM	49.1	7:00 PM	57.6
8:00 PM	49.1	8:00 PM	55.9
9:00 PM	47.3	9:00 PM	55.1
10:00 PM	48.2	10:00 PM	54.5
11:00 PM	46.1	11:00 PM	54.2
12:00 AM	44.1	12:00 AM	52.6
1:00 AM	42.3	1:00 AM	50.2
2:00 AM	41.6	2:00 AM	46.0
3:00 AM	43.5	3:00 AM	45.7
4:00 AM	43.8	4:00 AM	49.3
5:00 AM	49.0	5:00 AM	54.1
6:00 AM	53.4	6:00 AM	60.3
7:00 AM	54.0	7:00 AM	60.6
8:00 AM	51.2	8:00 AM	61.0
9:00 AM	50.7	9:00 AM	59.5
10:00 AM	47.9	10:00 AM	58.2
11:00 AM	51.6	11:00 AM	57.2
12:00 PM	52.3	12:00 PM	57.1
1:00 PM	59.0	1:00 PM	60.3
2:00 PM	48.9	2:00 PM	54.1
3:00 PM	39.0	3:00 PM	37.7
<i>Highest L_{eq}</i>	<i>59.0</i>	<i>Highest L_{eq}</i>	<i>61.0</i>
<i>24-Hour</i>	<i>50.4</i>	<i>24-Hour</i>	<i>57.0</i>
<i>CNEL</i>	<i>55.0</i>	<i>CNEL</i>	<i>61.7</i>

Figure 1-C: Noise Measurement Locations



b) Noise Modeling Software

The primary source of noise impacts to the project site will be vehicular noise from SR-78 to the north and West Lilac Road to the south. The projected roadway noise levels from vehicular traffic were calculated using the methods in the Highway Noise Model published by the Federal Highway Administration (FHWA Highway Traffic Noise Prediction Model, FHWA-RD-77-108, December 1978). The FHWA Model uses the traffic volume, vehicle mix, speed, and roadway geometry to compute the equivalent noise level. A spreadsheet calculation was used which computes equivalent noise levels for each of the time periods used in the calculation of CNEL. Weighting these equivalent noise levels and summing them gives the CNEL for the traffic projections.

c) Noise Calculations and Factors

Noise is defined as unwanted or annoying sound which interferes with or disrupts normal activities. Exposure to high noise levels has been demonstrated to cause hearing loss. The individual human response to environmental noise is based on the sensitivity of that individual, the type of noise that occurs and when the noise occurs.

Sound is measured on a logarithmic scale consisting of sound pressure levels known as a decibel (dB). The sounds heard by humans typically do not consist of a single frequency but of a broadband of frequencies having different sound pressure levels. The method for evaluating all the frequencies of the sound is to apply an A-weighting to reflect how the human ear responds to the different sound levels at different frequencies. The A-weighted sound level adequately describes the instantaneous noise whereas the equivalent sound level depicted as L_{eq} represents a steady sound level containing the same total acoustical energy as the actual fluctuating sound level over a given time interval.

The Community Noise Equivalent Level (CNEL) is the 24 hour A-weighted average for sound, with corrections for evening and nighttime hours. The corrections require an addition of 5 decibels to sound levels in the evening hours between 7 p.m. and 10 p.m. and an addition of 10 decibels to sound levels at nighttime hours between 10 p.m. and 7 a.m. These additions are made to account for the increased sensitivity during the evening and nighttime hours when sound appears louder.

A vehicle's noise level is from a combination of the noise produced by the engine, exhaust and tires. The cumulative traffic noise levels along a roadway segment are based on three primary factors: the amount of traffic, the travel speed of the traffic, and the vehicle mix ratio or number of medium and heavy trucks. The intensity of traffic noise is increased by higher traffic volumes, greater speeds and increased number of trucks.

Because mobile/traffic noise levels are calculated on a logarithmic scale, a doubling of the traffic noise or acoustical energy results in a noise level increase of 3 dBA. Therefore, the doubling of the traffic volume, without changing the vehicle speeds or mix ratio, results in a noise increase of 3 dBA. Mobile noise levels radiate in an almost oblique fashion from the source and drop off at a rate of 3 dBA for each doubling of distance under hard site conditions and at a rate of 4.5 dBA for soft site conditions. Hard site conditions consist of concrete, asphalt and hard pack dirt while soft site conditions exist in areas having slight grade changes, landscaped areas and vegetation. On the other hand, fixed/point sources radiate outward uniformly as sound travels away from the source. Their sound levels attenuate or drop off at a rate of 6 dBA for each doubling of distance.




The most effective noise reduction methods consist of controlling the noise at the source, blocking the noise transmission with barriers or relocating the receiver. Any or all of these methods may be required to reduce noise levels to an acceptable level.

2.0 NOISE SENSITIVE LAND USES (NSLU)

2.1 Guidelines for the Determination of Significance

The County's General Plan Chapter 8 Noise Element uses the Noise Compatibility Guidelines listed in Table N-1 of the General Plan Noise Element (provided below) to determine the compatibility of land use when evaluating proposed development projects. The Noise Compatibility Guidelines indicate ranges of compatibility and are intended to be flexible enough to apply to a range of projects and environments. For example, a commercial project would be evaluated differently than a residential project in a rural area or a mixed-use project in a more densely developed area of the County.

TABLE N-1: NOISE COMPATIBILITY GUIDELINES (CNEL)

Table N-1 Noise Compatibility Guidelines								
Land Use Category		Exterior Noise Level (CNEL)						
			55	60	65	70	75	80
A	Residential—single family residences, mobile homes, senior housing, convalescent homes							
B	Residential—multi-family residences, mixed-use (commercial/residential)							
C	Transient lodging—motels, hotels, resorts							
D*	Schools, churches, hospitals, nursing homes, child care facilities							
E*	Passive recreational parks, nature preserves, contemplative spaces, cemeteries							
F*	Active parks, golf courses, athletic fields, outdoor spectator sports, water recreation							
G*	Office/professional, government, medical/dental, commercial, retail, laboratories							
H*	Industrial, manufacturing, utilities, agriculture, mining, stables, ranching, warehouse, maintenance/repair							
	ACCEPTABLE—Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal construction, without any special noise insulation requirements.							
	CONDITIONALLY ACCEPTABLE—New construction or development should be undertaken only after a detailed noise analysis is conducted to determine if noise reduction measures are necessary to achieve acceptable levels for land use. Criteria for determining exterior and interior noise levels are listed in Table N-2, Noise Standards. If a project cannot mitigate noise to a level deemed Acceptable, the appropriate county decision-maker must determine that mitigation has been provided to the greatest extent practicable or that extraordinary circumstances exist.							
	UNACCEPTABLE—New construction or development shall not be undertaken.							

* Denotes facilities used for part of the day; therefore, an hourly standard would be used rather than CNEL (refer to Table N-2).

Note: For projects located within an Airport Influence Area of an adopted Airport Land Use Compatibility Plan (ALUCP), additional Noise Compatibility Criteria restrictions may apply as specified in the ALUCP.

A land use located in an area identified as “acceptable” indicates that standard construction methods would attenuate exterior noise to an acceptable indoor noise level and that people can carry out outdoor activities with minimal noise interference. Land uses that fall into the “conditionally acceptable” noise environment should have an acoustical study that considers the type of noise source, the sensitivity of the noise receptor, and the degree to which the noise source may interfere with sleep, speech, or other activities characteristic of the land use. For land uses indicated as “conditionally acceptable,” structures must be able to attenuate the exterior noise to the indoor noise level as indicated in the Noise Standards listed in Table N-2 of the General Plan Noise Element (provided below). For land uses where the exterior noise levels fall within the “unacceptable” range, new construction generally should not be undertaken.

TABLE N-2: NOISE STANDARDS

Table N-2	Noise Standards ^{Note}
1.	The exterior noise level (as defined in Item 3) standard for Category A shall be 60 CNEL, and the interior noise level standard for indoor habitable rooms shall be 45 CNEL.
2.	The exterior noise level standard for Categories B and C shall be 65 CNEL, and the interior noise level standard for indoor habitable rooms shall be 45 CNEL.
3.	The exterior noise level standard for Categories D and G shall be 65 CNEL and the interior noise level standard shall be 50 dBA L_{eq} (one hour average).
4.	For single-family detached dwelling units, “exterior noise level” is defined as the noise level measured at an outdoor living area which adjoins and is on the same lot as the dwelling, and which contains at least the following minimum net lot area: (i) for lots less than 4,000 square feet in area, the exterior area shall include 400 square feet, (ii) for lots between 4,000 square feet to 10 acres in area, the exterior area shall include 10 percent of the lot area; (iii) for lots over 10 acres in area, the exterior area shall include 1 acre.
5.	For all other residential land uses, “exterior noise level” is defined as noise measured at exterior areas which are provided for private or group usable open space purposes. “Private Usable Open Space” is defined as usable open space intended for use of occupants of one dwelling unit, normally including yards, decks, and balconies. When the noise limit for Private Usable Open Space cannot be met, then a Group Usable Open Space that meets the exterior noise level standard shall be provided. “Group Usable Open Space” is defined as usable open space intended for common use by occupants of a development, either privately owned and maintained or dedicated to a public agency, normally including swimming pools, recreation courts, patios, open landscaped areas, and greenbelts with pedestrian walkways and equestrian and bicycle trails, but not including off-street parking and loading areas or driveways.
6.	For non-residential noise sensitive land uses, exterior noise level is defined as noise measured at the exterior area provided for public use.
7.	For noise sensitive land uses where people normally do not sleep at night, the exterior and interior noise standard may be measured using either CNEL or the one-hour average noise level determined at the loudest hour during the period when the facility is normally occupied.
8.	The exterior noise standard does not apply for land uses where no exterior use area is proposed or necessary, such as a library.
9.	For Categories E and F the exterior noise level standard shall not exceed the limit defined as “Acceptable” in Table N-1 or an equivalent one-hour noise standard.

Note: Exterior Noise Level compatibility guidelines for Land Use Categories A-H are identified in Table N-1, Noise Compatibility Guidelines.

2.2 Potential Noise Impacts

It is expected that the primary source of potential noise impacts to the project site will occur from vehicular traffic noise along SR-78 and adjacent Smilax Road and Poinsettia Avenue. The Buildout scenario includes the future year 2035 traffic volume forecasts provided by SANDAG's Series 13 traffic forecast model and the Project's Traffic Study. The future traffic along SR-78 is anticipated to slightly decrease in the year 2035 from existing conditions. The traffic volumes on Poinsettia Avenue and Smilax Road are anticipated to increase in the future 2035 conditions. The existing and future roadway parameters and inputs utilized in this analysis are provided in Table 2-1.

Additionally, the noise level changes from the existing and future conditions are also provided in Table 2-1. The roadway segment noise levels projected were calculated using the methods in the Highway Noise Model published by the Federal Highway Administration (FHWA Highway Traffic Noise Prediction Model, FHWA-RD-77-108, December 1978). The FHWA Model uses the traffic volume, vehicle mix, speed, and roadway geometry to compute the equivalent noise level. The vehicle mix and speeds were assumed to be the same in the modeling to determine the overall noise level increases based on traffic volumes.

Table 2-1: Traffic Volumes and Increased Noise Levels

Roadway	Existing Average Daily Traffic (ADT)	Year 2035 Average Daily Traffic (ADT)	Difference (ADT)	Noise Level Increase (dBA CNEL)
SR-78 ¹	138,700	135,700	-3,000	0.0 ³
Poinsettia Avenue ²	8,170	15,339	7,130	+2.7
Smilax Road ²	7,740	14,813	6,860	+2.8
¹ SANDAG Series 13 Traffic Forecast Year 2012 = 139,500 ADT and Year 2020 = 138,700 ADT.				
² Existing and Year 2035 Traffic Volumes (LLG, 2019).				
³ Volume decreases slightly, conservatively assumed to be the same noise level.				

Based on the ambient measurements, SR-78 background noise levels were typically below 55 dBA, due to the distance, vertical and horizontal alignments and intervening topography and existing structures. Additionally, as can be seen in Table 2-1, the volumes along SR-78 are anticipated to decrease slightly. The limited accuracy of the modeling due to these factors and the low ambient levels, SR-78 was not incorporated into the future modeling.

The Buildout scenario includes the future roadway parameters and inputs utilized in this analysis are provided in Table 2-1. Based on the County of San Diego Department of Public Works Public Road Standards, Smilax Road and Poinsettia Avenue have designed traffic speed of 40 MPH.

To assess the peak hour traffic noise conditions, 10% of the ADT was utilized and a conservative vehicle mix was also utilized to predict the worst case noise levels.

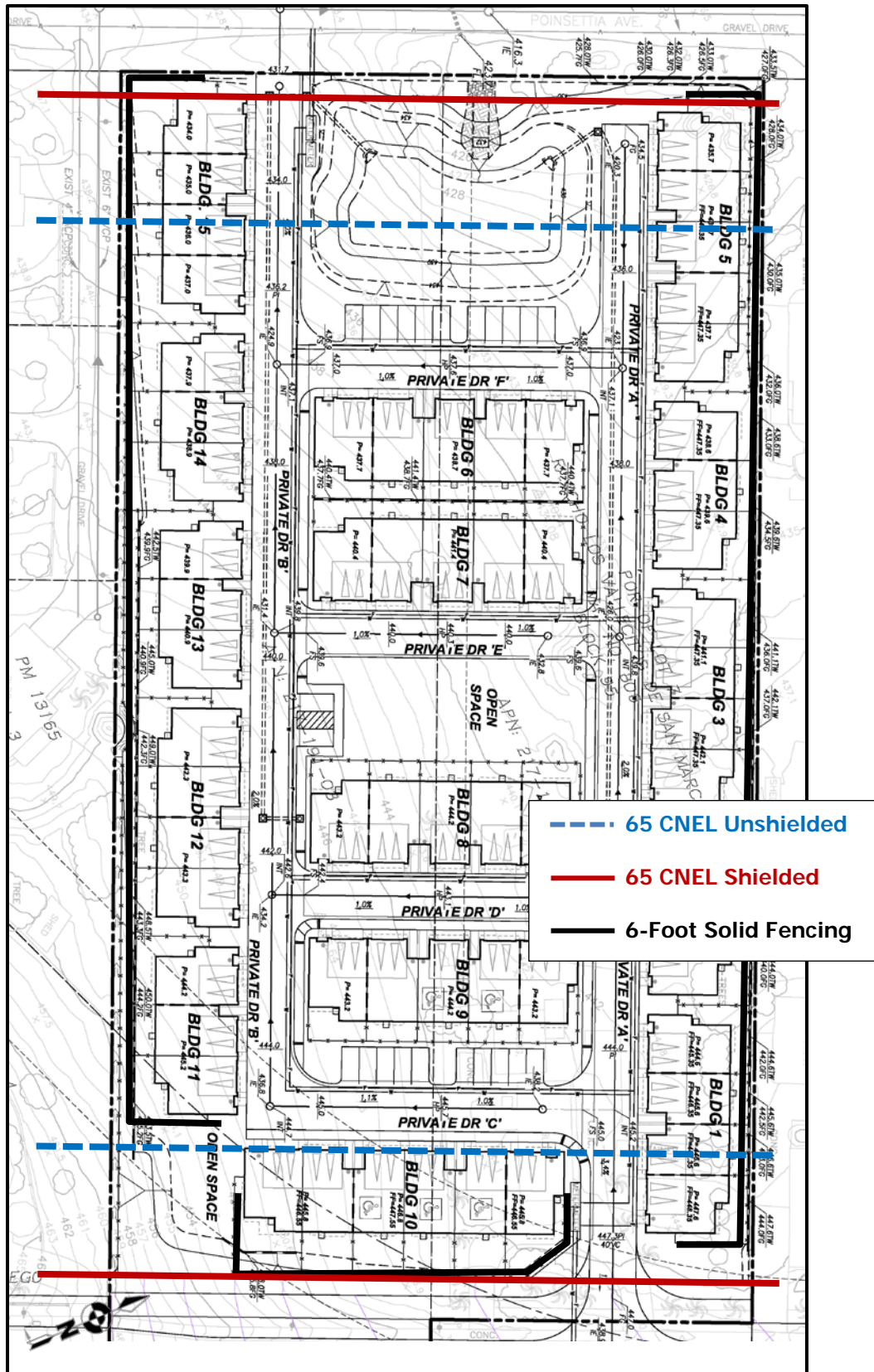
To account for the topographic features between the roadways and the noise sensitive land uses, soft site conditions were used in the calculations. Based on the exterior noise model, the worst-case noise level from Smilax Road and Poinsettia Avenue was found to be less than 70 dBA CNEL at the nearest NSLU of the site. The modeling results are provided in Figure 2-A.

Figure 2-A: Future Noise Levels

Project Name:	Smilax	Date:	28-May-19	
Project Number:	18-71	Location:	San Diego	
Traffic Volumes, Mix and Speeds				
Mix Ratio by Percent	Autos 95.0	Med. Trucks 3.0	Heavy Trucks 2.0	
Propagation Rule	Soft			
Roadway	ADT	Speed MPH	CNEL @ 50 Feet	60 CNEL (Feet)
Poinsettia Avenue	15,339	40	70.1	237
Smilax Road	14,813	40	70.0	232
Noise Reduction due to Distance				
	Distance	Reduction	Resultant Level	
Poinsettia Avenue	55	-0.62	69.5	
Smilax Road	60	-1.19	68.8	

Additionally, the NSLU areas are shielded by the proposed solid side yard fences and solid perimeter fencing, six (6) feet in height. The solid fencing will be vinyl, ¾-inch or thicker consisting of solid panels on minimum 4x4-inch posts with no cracks or gaps through or below and all seams or cracks will be filled or caulked. The proposed fencing will break the line of sight to the roadways and provide a 5 to 8 decibel reduction. Therefore, the noise levels at the NSLU adjacent to the roadways will be reduced to 65 dBA CNEL or less. Based on this finding, outdoor NSLU areas are anticipated to be below the County of San Diego 65 dBA CNEL threshold with the perimeter fencing and no additional exterior analysis is required. The anticipated future, shielded and unshielded, noise contours at the site are provided graphically in Figure 2-B. The perimeter fencing is also shown in Figure 2-B.

Figure 2-B: Future Noise Contours



The County of San Diego as part of its noise guidelines also states, consistent with Title 24 of

the California Code of Regulations (CCR), a project is required to perform an interior assessment on the portions of a project site where building façade noise levels are above the normally compatible noise level in order to ensure that acceptable interior noise levels can be achieved. The County of San Diego's Noise Compatibility Guidelines require interior noise levels in residential structures to be reduced to 45 dBA CNEL. Standard building construction will provide a noise reduction of approximately 15 dBA with a windows open condition (Source: Federal Highway Administration Highway Traffic Noise Analysis and Abatement Policy and Guidance). Therefore, if building facades are found to be above 60 dBA CNEL, an interior noise assessment should be provided.

Based on the future 2035 traffic volumes, the building facades were found to be above 60 dBA CNEL. Building facades could be as high as 70 dBA CNEL at 50 feet and the 60 dBA CNEL contours from Smilax Road and Poinsettia Avenue could extend 232 and 237 feet from the center lines at the first floor level, respectively. The second floor level 60 dBA CNEL contours encompass the entire site. Therefore, per the General Plan Noise Element, a noise protection easement is required for the entire site. The noise protection easement will require that the implementation of building design and construction measures to ensure that interior noise levels do not exceed 45 CNEL.

An interior noise study is required for those units located in the noise easement to determine the mitigation required to achieve an interior noise level of 45 dBA CNEL. This report would finalize the noise requirements based upon precise grading plans and actual building design specifications. This is to ensure that interior noise levels for the proposed residential structures comply with the interior noise level requirement of 45 dBA pursuant to the County Noise Element. It should be noted; interior noise levels of 45 dBA CNEL can be obtained with conventional building construction methods, for example by providing-mechanical ventilation (e.g. air conditioning) and/or providing upgraded windows at all affected residential units.

The proposed project is not located in the vicinity of a private airstrip; the proposed project is subject to the McClellan-Palomar Airport Land Use Compatibility Plan, but is located 4 miles from the airport. Therefore, is not sufficiently proximate that the project would expose people residing or working in the project area to excessive noise levels.

2.3 Off-site Noise Impacts

The off-site project related roadway segment noise levels projected in this report were calculated using the methods in the Highway Noise Model published by the Federal Highway Administration (FHWA Highway Traffic Noise Prediction Model, FHWA-RD-77-108, December 1978). The FHWA Model uses the traffic volume, vehicle mix, speed, and roadway geometry to compute the equivalent noise level. A spreadsheet calculation was used which computes equivalent noise

levels for each of the time periods used in the calculation of CNEL. Weighting these equivalent noise levels and summing them gives the CNEL for the traffic projections. The noise contours are then established by iterating the equivalent noise level over many distances until the distance to the desired noise contour(s) are found. For this project the 60 dBA CNEL contour was calculated based upon the County of San Diego thresholds for the single family uses adjacent to the site.

Soft site conditions were used along all roadway segments to develop the worst-case noise contours and to analyze noise impacts. The future traffic noise model utilizes a conservative vehicle mix of 95% Autos, 3% Medium Trucks and 2% Heavy Trucks for all analyzed roadway segments to account for additional truck traffic. The vehicle mix provides the hourly distribution percentages of automobile, medium trucks and heavy trucks for input into the FHWA Model.

Direct and cumulative roadway noise impacts would be considered significant if the project increases noise levels for a noise sensitive land use by 3 dBA CNEL and if: (1) the existing noise levels already exceed the 60 dBA CNEL residential standard, or (2) the project increases noise levels from below the 60 dBA CNEL standard to above 60 dBA CNEL in the area adjacent to the roadway segment. The County of San Diego requires that the Cumulative without Project scenario and the cumulative with project scenario be compared to determine if significant impacts occur. Project generated cumulative roadway noise impacts would be considered significant if the project raises the Cumulative without Project noise level by greater than 1 dBA.

a) Direct Noise Impacts

To determine if direct off-site noise level increases associated with the development of the proposed project will create noise impacts. The noise levels for the existing conditions were compared with the noise level increase of existing plus the proposed project. Utilizing the project's traffic assessment (Source: LLG, 2019) noise contours were developed for the following traffic scenarios:

Existing: Current day noise conditions without construction of the proposed project.

Existing Plus Project: Current day noise conditions plus the completion of the proposed project.

Existing vs. Existing Plus Project: Comparison of the direct project related noise level increases in the vicinity of the proposed project site.

The noise levels and the distances to the 60 dBA CNEL contours for the roadways in the vicinity of the Project site are given in Table 2-2 for the Existing Scenario and in Table 2-3 for the Existing plus Project Scenario. Note that the values given do not take into account the effect of any noise

barriers or topography that may affect ambient noise levels.

Table 2-2: Existing Roadway Noise Levels

Roadway and Roadway Segment	ADT ¹	Vehicle Speeds (MPH) ¹	Noise Level @ 50-Feet (dBA CNEL)	60 dBA CNEL Contour Distance (Feet)
Poinsettia Avenue				
Oleander Avenue to Roadrunner Road	8,170	40	67.4	156
Smilax Road				
Mimosa Avenue to Oleander Avenue	7,740	40	67.2	150
Oleander Avenue				
Parkwood Ave to Poinsettia Ave	5,685	40	65.8	123
Poinsettia Ave to Smilax Rd	9,210	40	67.9	169
Smilax Rd to Alamitos Way	7,615	40	67.1	149
¹ Source: Project Traffic study prepared by Source: LLG, 2019				

Table 2-3: Existing + Project Noise Levels

Roadway and Roadway Segment	ADT ¹	Vehicle Speeds (MPH) ¹	Noise Level @ 50-Feet (dBA CNEL)	60 dBA CNEL Contour Distance (Feet)
Poinsettia Avenue				
Oleander Avenue to Roadrunner Road	8,220	40	67.4	157
Smilax Road				
Mimosa Avenue to Oleander Avenue	8,013	40	67.3	154
Oleander Avenue				
Parkwood Ave to Poinsettia Ave	5,710	40	65.9	123
Poinsettia Ave to Smilax Rd	9,284	40	68.0	170
Smilax Rd to Alamitos Way	7,764	40	67.2	151
¹ Source: Project Traffic study prepared by Source: LLG, 2019				

Table 2-4 presents the comparison of the Existing Year with and without project related noise levels. The roadway segment noise levels will increase 0.1 dBA CNEL with the development of the proposed project. The project does not create a direct noise level increase of more than 3 dBA CNEL on any roadway segment as shown in Table 2-4. Therefore, the proposed project's direct contributions to off-site roadway noise increases will not cause any direct significant impacts to any existing noise sensitive land uses. Typically, it requires a project to double (or add 100%) to the traffic volumes to be a perceivable difference to the human ear and result in a direct impact of 3 dBA CNEL. Roadway noise impacts are considered less than significant if the project does not increase noise levels by 3 dBA CNEL and the NSLU threshold.

Table 2-4: Existing vs. Existing + Project Noise Levels

Roadway and Roadway Segment	Existing Noise Level @ 50-Foot (dBA CNEL)	Existing + Project Noise Level @ 50-Foot (dBA CNEL)	Project Related Direct Noise Level Increase (dBA CNEL)
Poinsettia Avenue			
Oleander Avenue to Roadrunner Road	67.4	67.4	0.0
Smilax Road			
Mimosa Avenue to Oleander Avenue	67.2	67.3	0.1
Oleander Avenue			
Parkwood Ave to Poinsettia Ave	65.8	65.9	0.1
Poinsettia Ave to Smilax Rd	67.9	68.0	0.1
Smilax Rd to Alamitos Way	67.1	67.2	0.1
Sound Levels provided are worst-case and do not take into account topography or shielding from barriers.			

b) Cumulative Noise Impacts

To determine if cumulative off-site noise level increases associated with the development of the proposed project and other planned or permitted projects in the vicinity will create noise impacts, the noise levels for the near-term project Buildout and other planned and permitted projects were compared with the existing conditions. Utilizing the project's traffic assessment (Source: Source: LLG, 2019) noise contours were developed for the following traffic scenarios:

Existing Plus Cumulative Projects Plus Project: Current noise conditions plus the completion of the project and the completion of other permitted, planned projects or approved ambient growth factors.

Existing vs. Existing Plus Cumulative Plus Project: Comparison of the existing noise levels and the related noise level increases from the combination of the proposed project and all other planned or permitted projects in the vicinity of the site.

The existing noise levels and the distances to the 60 dBA CNEL contours for the roadways in the vicinity of the Project site are given in Table 2-2 above for the Existing Scenario. The near-term cumulative noise conditions are provided in Table 2-5 below. No noise barriers or topography that may affect noise levels were incorporated in the calculations. Table 2-6 presents the comparison of the Existing Year and the Cumulative noise levels.

Table 2-5: Existing + Project + Cumulative Noise Levels

Roadway and Roadway Segment	ADT ¹	Vehicle Speeds (MPH) ¹	Noise Level @ 50-Foot (dBA CNEL)	60 dBA CNEL Contour Distance (Feet)
Poinsettia Avenue				
Oleander Avenue to Roadrunner Road	8,383	40	67.5	159
Smilax Road				
Mimosa Avenue to Oleander Avenue	8,168	40	67.4	156
Oleander Avenue				
Parkwood Ave to Poinsettia Ave	5,824	40	65.9	124
Poinsettia Ave to Smilax Rd	9,468	40	68.1	172
Smilax Rd to Alamitos Way	7,916	40	67.3	153
¹ Source: Project Traffic study prepared by Source: LLG, 2019				

Table 2-6: Existing vs. Existing + Project + Cumulative Noise Levels

Roadway and Roadway Segment	Existing Noise Level @ 50-Foot (dBA CNEL)	Existing + Project Noise Level @ 50-Foot (dBA CNEL)	Project Related Direct Noise Level Increase (dBA CNEL)
Poinsettia Avenue			
Oleander Avenue to Roadrunner Road	67.4	67.5	0.1
Smilax Road			
Mimosa Avenue to Oleander Avenue	67.2	67.4	0.2
Oleander Avenue			
Parkwood Ave to Poinsettia Ave	65.8	65.9	0.1
Poinsettia Ave to Smilax Rd	67.9	68.1	0.2
Smilax Rd to Alamitos Way	67.1	67.3	0.2
Sound Levels provided are worst-case and do not take into account topography or shielding from barriers.			

The roadway segment noise levels will increase 0.2 dBA CNEL with the development of the proposed project and other planned and approved projects. Therefore, the proposed project's contributions to cumulative off-site roadway noise increases would not result in significant impacts to existing noise sensitive land uses.

2.4 Conclusions

It was determined from the analysis that the NSLU areas are shielded by the proposed solid side yard fences and solid perimeter fencing, six (6) feet in height. The solid fencing will be vinyl, ¾-inch or thicker consisting of solid panels on minimum 4x4-inch posts with no cracks or gaps through or below and all seams or cracks will be filled or caulked. The proposed fencing will break the line of sight to the roadways and provide a 5 to 8 decibel reduction. Therefore, the noise levels at the NSLU adjacent to the roadways will be reduced to 65 dBA

CNEL or less. Based on the findings, outdoor NSLU areas are anticipated to be below the County of San Diego 65 dBA CNEL threshold with the perimeter fencing and no additional exterior analysis is required. The solid perimeter fencing, six (6) feet in height, will be included as part of the Project's Conditions of Approval.

The County of San Diego as part of its noise guidelines also states, consistent with Title 24 of the California Code of Regulations (CCR), a project is required to perform an interior assessment on the portions of a project site where building façade noise levels are above the normally compatible noise level in order to ensure that acceptable interior noise levels can be achieved. Based on the future 2035 traffic volumes, the building facades were found to be above 60 dBA CNEL. Based on the future 2035 traffic volumes, the building facades were found to be above 60 dBA CNEL. Building facades could be as high as 70 dBA CNEL at 50 feet and the 60 dBA CNEL contours from Smilax Road and Poinsettia Avenue could extend 232 and 237 feet from the center lines at the first floor level, respectively. The second floor level 60 dBA CNEL contours encompass the entire site. Therefore, per the General Plan Noise Element, a noise protection easement is required for the entire site. The noise protection easement will require that the implementation of building design and construction measures to ensure that interior noise levels do not exceed 45 CNEL.

An interior noise study is required for those units located in the noise easement to determine the mitigation required to achieve an interior noise level of 45 dBA CNEL. This report would finalize the noise requirements based upon precise grading plans and actual building design specifications. This is to ensure that interior noise levels for the proposed residential structures comply with the interior noise level requirement of 45 dBA pursuant to the County Noise Element. It should be noted; interior noise levels of 45 dBA CNEL can be obtained with conventional building construction methods, for example by providing-mechanical ventilation (e.g. air conditioning) and/or providing upgraded windows at all affected residential units.

The proposed project is not located in the vicinity of a private airstrip; the proposed project is subject to the McClellan-Palomar Airport Land Use Compatibility Plan, but is located 4 miles from the airport. Therefore, is not sufficiently proximate that the project would expose people residing or working in the project area to excessive noise levels.

The project does not create a direct impact of more than 3 dBA CNEL on any roadway segment. Therefore, the proposed project's direct contributions to off-site roadway noise increases will not cause any significant impacts to any existing noise sensitive land uses. Cumulative off-site roadway noise increases would not result in significant impacts to existing noise sensitive land uses. Therefore, no offsite Project related traffic noise impacts are anticipated from the Project's cumulative contributions.

3.0 PROJECT-GENERATED AIRBORNE NOISE

3.1 Guidelines for the Determination of Significance

According to Section 36.404 of the County Noise Ordinance, it shall be unlawful for any person to cause or allow the creation of any noise to the extent that the one-hour average sound level, at any point on or beyond the boundaries of the property exceeds the applicable limits on Table 3-1. An impact would occur and mitigation would be needed if the project will generate airborne noise which, together with noise from all sources, will be in excess of either of the following:

Table 3-1: San Diego County Code Section 36.404

SOUND LEVEL LIMITS IN DECIBELS (dBA)

ZONE		APPLICABLE LIMIT ONE-HOUR AVERAGE SOUND LEVEL (DECIBELS)
R-S, R-D, R-R, R-MH, A-70, A-72, S-80, S-81, S-87, S-88, S-90, S-92, R-V, and R-U Use Regulations with a density of less than 11 dwelling units per acre.	7 a.m. to 10 p.m.	50
	10 p.m. to 7 a.m.	45
R-RO, R-C, R-M, C-30, S-86, R-V, R-U and V5. Use Regulations with a density of 11 or more dwelling units per acre.	7 a.m. to 10 p.m.	55
	10 p.m. to 7 a.m.	50
S-94, V4, and all other commercial zones.	7 a.m. to 10 p.m.	60
	10 p.m. to 7 a.m.	55
V1, V2	7 a.m. to 7 p.m.	60
V1, V2	7 p.m. to 10 p.m.	55
V1	10 p.m. to 7 a.m.	55
V2	10 p.m. to 7 a.m.	50
V3	7 a.m. to 10 p.m.	70
	10 p.m. to 7 a.m.	65
M-50, M-52, M-54	Anytime	70
S-82, M-58, and all other industrial zones.	Anytime	75

(a) If the measured ambient level exceeds the applicable limit noted above, the allowable one hour average sound level shall be the ambient noise level, plus three decibels. The ambient noise level shall be measured when the alleged noise violation source is not operating.

(b) The sound level limit at a location on a boundary between two zones is the arithmetic mean of the respective limits for the two zones; provided however, that the one-hour average sound level limit applicable to extractive industries, including but not limited to borrow pits and mines, shall be 75 decibels at the property line regardless of the zone which the extractive industry is actually located.

The site is subject to the General Plan Village Regional Category, Village Residential 2 (VR-2)

Land Use Designation, and Rural Residential (RR) Zoning Regulation. The surrounding properties are zoned RR (Rural Residential). According to Section 36.404 of the County of San Diego Noise Ordinance, all areas zoned RR have a most restrictive property line standard of 50 dBA Leq for the daytime hours of 7 a.m. to 10 p.m. and 45 dBA Leq for the nighttime hours of 10 p.m. to 7 a.m. Onsite noise generation due to the proposed residential development project would primarily consist of normal residential activities and mechanical heating ventilation and air conditioning (HVAC) equipment.

Construction Noise: Noise generated by construction activities related to the project will exceed the standards listed in San Diego County Code Sections as follows.

Section 36.408: Hours of Operation of Construction Equipment

Except for emergency work, it shall be unlawful for any person to operate or cause to be operated, construction equipment:

- a. Between 7 p.m. and 7 a.m.
- b. On a Sunday or a holiday. For purposes of this section, a holiday means January 1st, the last Monday in May, July 4th, the first Monday in September, December 25th and any day appointed by the President as a special national holiday or the Governor of the State as a special State holiday. A person may, however, operate construction equipment on a Sunday or holiday between the hours of 10 a.m. and 5 p.m. at the person's residence or for the purpose of constructing a residence for himself or herself, provided that the operation of construction equipment is not carried out for financial consideration or other consideration of any kind and does not violate the limitations in sections 36.409 and 36.410.

Section 36.409: Sound Level Limitations on Construction Equipment

Except for emergency work, it shall be unlawful for any person to operate construction equipment or cause construction equipment to be operated, that exceeds an average sound level of 75 decibels for an eight-hour period, between 7 a.m. and 7 p.m., when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is being received.

Section 36.410: Sound Level Limitations on Impulsive Noise

In addition to the general limitations on sound levels in section 36.404 and the limitations on construction equipment in section 36.409, the following additional sound level limitations shall apply:

- (a) Except for emergency work or work on a public road project, no person shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in Table 36.410A (provided below), when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period, as described in subsection (c) below. The maximum sound level depends on the use being made of the occupied property. The uses in Table 36.410A are as described in the County Zoning Ordinance.

TABLE 36.410A: MAXIMUM SOUND LEVEL (IMPULSIVE) MEASURED AT OCCUPIED PROPERTY IN DECIBELS (dBA)

OCCUPIED PROPERTY USE	DECIBELS (dBA)
Residential, village zoning or civic use	82
Agricultural, commercial or industrial use	85

- (b) Except for emergency work, no person working on a public road project shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in Table 36.410B, when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period, as described in subsection (c) below. The maximum sound level depends on the use being made of the occupied property. The uses in Table 36.410B are as described in the County Zoning Ordinance.

TABLE 36.410B: MAXIMUM SOUND LEVEL (IMPULSIVE) MEASURED AT OCCUPIED PROPERTY IN DECIBELS (dBA) FOR PUBLIC ROAD PROJECTS

OCCUPIED PROPERTY USE	dB(A)
Residential, village zoning or civic use	85
Agricultural, commercial or industrial use	90

- (c) The minimum measurement period for any measurements conducted under this section shall be one hour. During the measurement period a measurement shall be conducted every minute from a fixed location on an occupied property. The measurements shall measure the maximum sound level during each minute of the measurement period. If the sound level caused by construction equipment or the producer of the impulsive noise exceeds the maximum sound level for any portion of any minute, it will be deemed that the maximum sound level was exceeded during that minute.

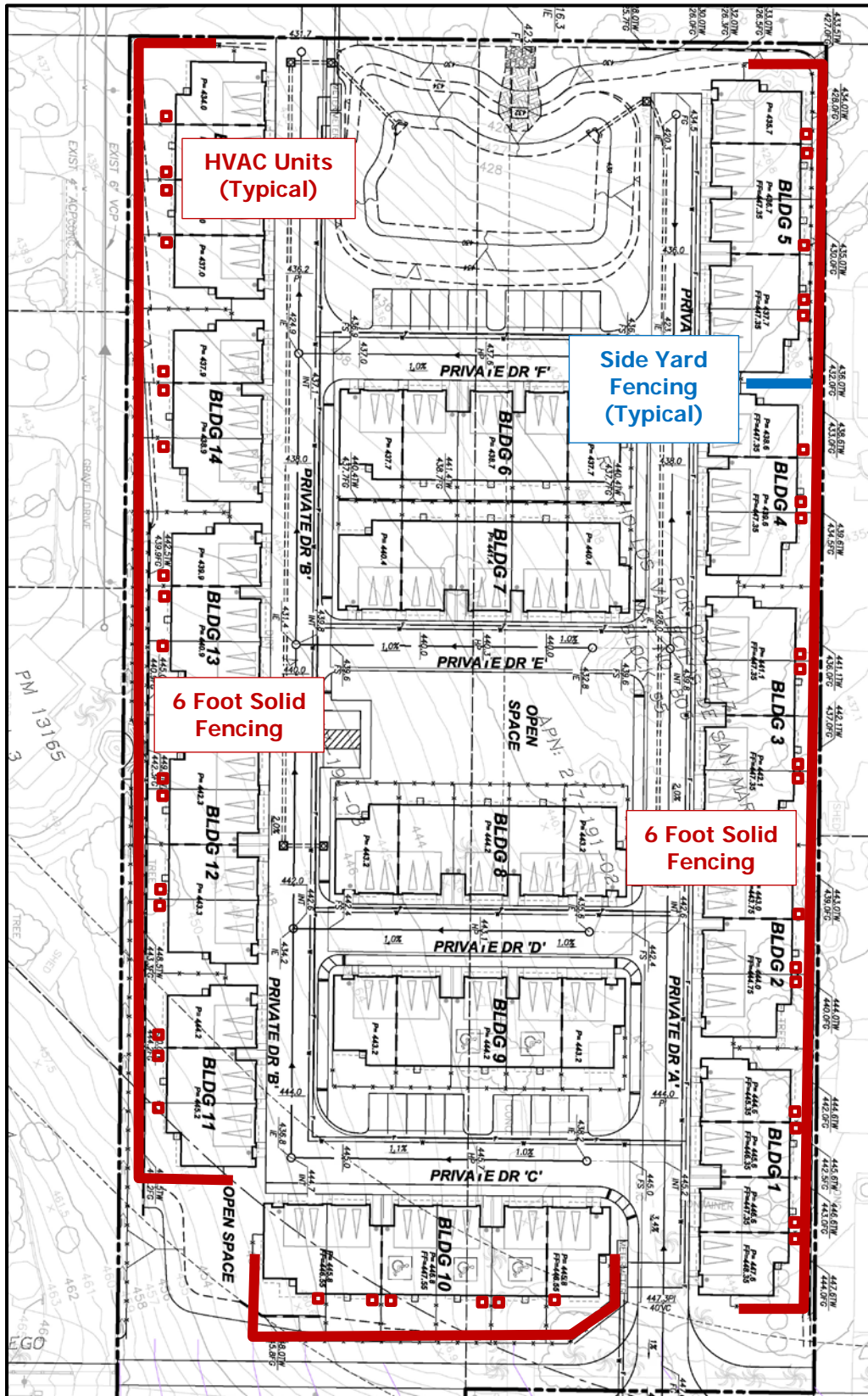
3.2 Potential Operational Noise Impacts (Non-Construction Noise)

Fixed or point sources radiate outward uniformly as sound travels away from the source. Their sound levels attenuate or drop off at a rate of 6 dBA for each doubling of distance. For example, a noise level of 75 dBA measured at 3 feet from the noise source to the receptor would be reduced to 69 dBA at 6 feet from the source to the receptor and 63 dBA at a distance of 12 feet.

Ground mechanical ventilation units (HVAC) will be installed at the proposed residential units. The project anticipates installing Carrier CA15NA (Series, 24-A) or equivalent HVAC units with a reference noise level of 71 dBA at 3-feet (Source: Carrier). The manufacturer's specifications and noise levels are provided in **Attachment A**. The HVAC units will cycle on and off throughout the day. Typically, HVAC units run for approximately 20 minutes each operating cycle to provide the necessary heating or cooling. It is anticipated that the HVAC units will operate twice in any given hour or run for 40 minutes in any given hour. Noise levels drop 3 decibels each time the duration of the source is reduced in half. Therefore, hourly HVAC noise level over a 40 minute period would be reduced approximately 2 decibels to 69 dBA based on operational time. To predict the property line noise level, a reference noise level of 69 dBA at 3-feet was used to represent the HVAC units.

The HVAC units are located 9 to 30 feet from the property lines and are shielded by the proposed homes, solid side yard fences and solid perimeter fencing, six (6) feet in height, as shown in Figure 3-A. The solid fencing will be vinyl, $\frac{3}{4}$ -inch or thicker consisting of solid panels on minimum 4x4-inch posts with no cracks or gaps through or below and all seams or cracks will be filled or caulked. The typical locations of the proposed HVAC units are also shown in Figure 3-A. Two HVAC units maybe located near each other with a side yard fence separating them and would create the worst case cumulative noise level. The remainder of the units are separated by at least 30 feet and have a 6-foot side yard fence shielding them. This separation of 30 feet would result in a 20 dBA difference between two separate HVAC units and would not cumulatively increase the noise levels. Therefore, the worst case combined noise from the HVAC would occur from two units.

Figure 3-A: Locations of the proposed HVAC Units



Utilizing a 6 dBA decrease per doubling of distance, noise levels at the nearest property line as described above were calculated for the HVAC. The noise levels associated with the HVAC will be limited with the proposed 6-foot perimeter fencing and 6-foot side yard fencing that will shield them both visually and acoustically. The HVAC units are located 9 to 30 from the nearest property lines. To determine the noise level reductions from the perimeter fencing, the Fresnel Barrier Reduction Calculations based on distance, source height, receiver elevation and the top of barrier were modeled. The adjacent receptor was located 5 feet behind the perimeter fencing. The noise level reductions due to distance and the fencing for the nearest property line is provided in Table 3-2 below. The Fresnel barrier reduction calculations for the fencing are provided in **Attachment B** of this report.

Table 3-2: Project HVAC Noise Levels (Nearest Property Line)

Noise Source	Reference Distance (Feet)	Noise Level (dBA)	Noise Reduction due to distance (dBA)	Noise Reduction from Fencing (dBA)	Resultant Noise Level @ Property Line (dBA)
AC Unit 1	3	69	-13	-14	42
AC Unit 2	3	69	-13	-14	42
CUMULATIVE PROPERTY LINE NOISE LEVEL					45

No impacts are anticipated at the property lines with the incorporation of the proposed 6-foot perimeter fencing as shown above in Figure 3-A. All other property lines are located further from the proposed HVAC units and the resulting noise levels would also be below the 45 dBA threshold.

3.3 Potential General Construction Noise Impacts

Construction noise represents a short-term impact on the ambient noise levels. Noise generated by construction equipment includes haul trucks, water trucks, graders, dozers, loaders and scrapers can reach relatively high levels. Grading activities typically represent one of the highest potential sources for noise impacts. The most effective method of controlling construction noise is through local control of construction hours and by limiting the hours of construction to normal weekday working hours.

The U.S. Environmental Protection Agency (U.S. EPA) has compiled data regarding the noise generating characteristics of specific types of construction equipment. Noise levels generated by heavy construction equipment can range from 60 dBA to in excess of 100 dBA when measured at 50 feet. However, these noise levels diminish rapidly with distance from the construction site at a rate of 6 dBA per doubling of distance. For example, a noise level of 75 dBA measured at

50 feet from the noise source to the receptor would be reduced to 69 dBA at 100 feet from the source to the receptor, and reduced to 63 dBA at 200 feet from the source.

The County's Noise Ordinance states that when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is being received. The properties surrounding the Project site are mostly occupied.

According to the project applicant, the equipment needed for the development will consist of up to two bulldozers, two sized scrapers, a front loader, a crawler type excavator, a compactor, a grader, a rubber tire backhoe and a water truck. The Project grading would be expected to take approximately 4-5 months. As mass grading is completed, underground trenching would take an additional nine months. After the grading and utility construction phases, the Project would pave the internal roadways.

The list of equipment and the associated noise levels utilized in this analysis are shown in Table 3-3. The grading equipment will be spread out over the project site from distances near the occupied property lines to distances of 500 feet or more away. Based upon the site plan, on average, the grading operations will occur 150 feet from the property lines. This means that the average distance from all the equipment to the nearest property line is 150 feet. As can be seen in Table 3-3, at an average distance of 150 feet from the construction activities to the nearest property line would result in a noise attenuation of -9.5 dBA without shielding. Additionally, the amount of time equipment is operating during a normal work day, referred to as duty-cycle, was assumed to be 8 hours.

Table 3-3: Construction Noise Levels

Construction Equipment	Quantity	Source Level @ 50-Feet (dBA Leq) ¹	Duty Cycle (Hours/Day)	Cumulative Noise Level @ 50-Feet (dBA Leq-8)
Dozer	2	74	8	77.0
Scraper	2	75	8	78.0
Excavator	1	72	8	72.0
Compactor	1	74	8	74.0
Grader	1	73	8	73.0
Backhoe	1	72	8	72.0
Water Truck	1	70	8	70.0
Cumulative Levels @ 50 Feet				83.0
Average Distance to Property Line (Feet)				150
Noise Reduction Due to Distance				-9.6
NEAREST PROPERTY LINE NOISE LEVEL				73.5
¹ Source: Empirical Data				

Given this, the noise levels will comply with the 75 dBA Leq average standard over 8 hours at the property lines. Therefore, no impacts are anticipated and no mitigation is required during construction of the proposed Project. Additionally, all equipment should be properly fitted with mufflers and all staging and maintenance should be conducted as far away for the existing residence as possible.

3.4 Potential Impulsive Noise Impacts

No blasting or rock crushing is anticipated during construction. Therefore, no impulsive noise sources are expected and the Project will comply with Section 36.410 of the County Noise Ordinance.

3.5 Conclusions

Onsite operational would consist of mechanical equipment (HVAC) and normal residential activities. Based on the distance separation from existing sensitive land use, the HVAC and residential activities are anticipated to comply with the County's Noise Ordinance 36.404. Therefore, no impacts will occur and no mitigation is needed for the project operations to comply with the County's standards and no impacts are anticipated and no mitigation is required.

Construction noise levels at an average distance of 150 feet would attenuate or be reduced 9.5 dBA. Given this and the spatial separation of the equipment, the noise levels are projected to comply with the County of San Diego's Noise Ordinance Section 36.409 standard of 75 dBA at all Project property lines and no significant impacts to noise would occur. Additionally, all equipment should be properly fitted with mufflers and all staging and maintenance should be conducted as far away for the existing residence as possible.

No blasting or rock crushing is anticipated during construction. Therefore, no impulsive noise sources are expected and the Project will comply with Section 36.410 of the County Noise Ordinance.

4.0 GROUND-BORNE VIBRATION AND NOISE IMPACTS

4.1 Guidelines for the Determination of Significance

Project implementation will expose uses to ground-borne vibration or noise levels equal to or in excess of the levels listed in Table 4 of the County of San Diego Guidelines for the Determination of Significance. For simplicity, the pertaining Table 4 is shown below.

Table 4
Guideline for Determining the Significance of
Ground-borne Vibration and Noise Impacts

Land Use Category	Ground-Borne Vibration Impact Levels (inches/sec rms)		Ground-Borne Noise Impact Levels (dB re 20 micro Pascals)	
	Frequent Events ¹	Occasional or Infrequent Events ²	Frequent Events ¹	Occasional or Infrequent Events ²
Category 1: Buildings where low ambient vibration is essential for interior operations. (research & manufacturing facilities with special vibration constraints)	0.0018 ³	0.0018 ³	Not applicable ⁵	Not applicable ⁵
Category 2: Residences and buildings where people normally sleep. (hotels, hospitals, residences, & other sleeping facilities)	0.0040	0.010	35 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use. (schools, churches, libraries, other institutions, & quiet offices)	0.0056	0.014	40 dBA	48 dBA

Source: U.S Department of Transportation, Federal Transit Administration, "Transit Noise and Vibration Impact Assessment," May 2006.

Notes to Table 4:

1. "Frequent Events" is defined as more than 70 vibration events per day. Most rapid transit projects fall into this category.
2. "Occasional or Infrequent Events" are defined as fewer than 70 vibration events per day. This combined category includes most commuter rail systems.
3. This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration sensitive manufacturing or research will require detailed evaluation to define acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.
4. Vibration-sensitive equipment is not sensitive to ground-borne noise.
5. There are some buildings, such as concert halls, TV and recording studios, and theaters that can be very sensitive to vibration and noise but do not fit into any of the three categories. Table 5 gives criteria for acceptable levels of ground-borne vibration and noise for these various types of special uses.
6. For Categories 2 and 3 with occupied facilities, isolated events such as blasting are significant when the peak particle velocity (PPV) exceeds one inch per second. Non-transportation vibration sources such as impact pile drivers or hydraulic breakers are significant when their PPV exceeds 0.1 inch per second. More specific criteria for structures and potential annoyance were developed by Caltrans (2004) and will be used to evaluate these continuous or transient sources in San Diego County.

4.2 Potential Impacts & Conclusions

There are no existing or proposed frequent activities on or near the proposed project site which would cause any significant vibration levels to existing buildings. The project site is adjacent to roadways and near SR-78. Caltrans has done extensive research on vibration created along freeways/roadways and found that because vehicles are supported by suspension systems and pneumatic tires, these vehicles are not an efficient source of ground vibration (*Source: Transportation and Construction Vibration Guidance Manual, Caltrans 2013*).

5.0 SUMMARY OF PROJECT IMPACTS, MITIGATION & CONCLUSIONS

Project design features (PDFs) have been included in this Project. The applicant has agreed to implement all PDFs and will be included as part of the Project's Conditions of Approval. The following PDFs applied in this analysis with the purpose of reducing noise include:

1. Installation of a six-foot high solid perimeter and side yard fencing
2. Provide a noise protection easement over the entire site to require the implementation of building design and construction measures to ensure that interior noise levels do not exceed 45 CNEL.

On-Site Traffic Noise Analysis

It was determined from the analysis that the Noise Sensitive Land Use (NSLU) areas are shielded by the proposed solid side yard fences and solid perimeter fencing, six (6) feet in height. The solid fencing will be vinyl, $\frac{3}{4}$ -inch or thicker consisting of solid panels on minimum 4x4-inch posts with no cracks or gaps through or below and all seams or cracks will be filled or caulked. The proposed fencing will break the line of sight to the roadways and provide a 5 to 8 decibel reduction. Therefore, the noise levels at the NSLU adjacent to the roadways will be reduced to 65 dBA CNEL or less. Based on the findings, outdoor NSLU areas are anticipated to be below the County of San Diego 65 dBA CNEL threshold with the perimeter fencing and no additional exterior analysis is required.

The County of San Diego as part of its noise guidelines also states, consistent with Title 24 of the California Code of Regulations (CCR), a project is required to perform an interior assessment on the portions of a project site where building façade noise levels are above the normally compatible noise level in order to ensure that acceptable interior noise levels can be achieved. Based on the future 2035 traffic volumes, the building facades were found to be above 60 dBA CNEL. Building facades could be as high as 70 dBA CNEL at 50 feet and the 60 dBA CNEL contours from Smilax Road and Poinsettia Avenue could extend 232 and 237 feet from the center lines at the first floor level, respectively. The second floor level 60 dBA CNEL contours encompass the entire site. Therefore, per the General Plan Noise Element, a noise protection easement is required for the entire site. The noise protection easement will require that the implementation of building design and construction measures to ensure that interior noise levels do not exceed 45 CNEL.

An interior noise study is required for those units located in the noise easement to determine the mitigation required to achieve an interior noise level of 45 dBA CNEL. This report would finalize the noise requirements based upon precise grading plans and actual building design specifications. This is to ensure that interior noise levels for the proposed residential structures

comply with the interior noise level requirement of 45 dBA pursuant to the County Noise Element. It should be noted; interior noise levels of 45 dBA CNEL can be obtained with conventional building construction methods, for example by providing-mechanical ventilation (e.g. air conditioning) and/or providing upgraded windows at all affected residential units.

Off-Site Traffic Noise Analysis

The project does not create a direct impact of more than 3 dBA CNEL on any roadway segment. Therefore, the proposed project's direct contributions to off-site roadway noise increases will not cause any significant impacts to any existing noise sensitive land uses. Cumulative off-site roadway noise increases would not result in significant impacts to existing noise sensitive land uses. Therefore, no offsite Project related traffic noise impacts are anticipated from the Project's cumulative contributions.

Operational Noise

Mechanical equipment (HVAC) and normal residential activities are anticipated to comply with the County's Noise Ordinance 36.404. Therefore, no impacts will occur and no mitigation is needed for the project operations to comply with the County's standards and no impacts are anticipated and no mitigation is required.

Construction Noise Analysis

Construction noise levels at an average distance of 150 feet would attenuate or be reduced 9.5 dBA. Given this and the spatial separation of the equipment, the noise levels are projected to comply with the County of San Diego's Noise Ordinance Section 36.409 standard of 75 dBA at all Project property lines and no significant impacts to noise would occur. Additionally, all equipment should be properly fitted with mufflers and all staging and maintenance should be conducted as far away for the existing residence as possible.

No blasting or rock crushing is anticipated during construction. Therefore, no impulsive noise sources are expected and the Project will comply with Section 36.410 of the County Noise Ordinance.

Based on the foregoing and the analysis set forth herein, the proposed project will not generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the County General Plan or applicable noise ordinance or applicable standards of other agencies.

Vibration Analysis

There are no existing or proposed frequent activities on or near the proposed project site which would cause any significant vibration levels to existing buildings. The project site is adjacent to roadways and near SR-78. Caltrans has done extensive research on vibration created along freeways/roadways and found that because vehicles are supported by suspension systems and pneumatic tires, these vehicles are not an efficient source of ground vibration (*Source: Transportation and Construction Vibration Guidance Manual, Caltrans 2013*). Therefore, no impacts from excessive groundborne vibration or groundborne noise levels are anticipated.

Airport Noise

The proposed project is not located in the vicinity of a private airstrip; the proposed project is subject to the McClellan-Palomar Airport Land Use Compatibility Plan, but is located 4 miles from the airport. Therefore, is not sufficiently proximate that the project would expose people residing or working in the project area to excessive noise levels.

6.0 CERTIFICATIONS

The contents of this report represent an accurate depiction of the future acoustical environment and impacts within and surrounding the Smilax residential development. This report was prepared utilizing the latest guidelines and reduction methodologies. This report was prepared by Jeremy Loudon; a County approved CEQA Consultant for Acoustics.

DRAFT

Jeremy Loudon, Principal
Ldn Consulting, Inc.
780-473-1253
jloudon@ldnconsulting.net

Date March 24, 2020

ATTACHMENT A

HVAC NOISE LEVELS AND SPECIFICATIONS

ATTACHMENT B

FRESNEL BARRIER REDUCTION
CALCULATIONS