Appendix J

Noise Study

NOISE ASSESSMENT

Jefferson Oceanside
City of Oceanside

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Project: 19-128 Jefferson Oceanside Noise

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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 µPa. 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. Leq 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 and vibration impacts to and from the proposed Jefferson Oceanside Apartment project. The site is located just south of the Crouch Light Rail Station or south of the intersection Skylark Drive and Crouch Street in Oceanside, in central coastal San Diego County. The project is located east of Interstate 5, south of and adjacent to Oceanside Boulevard in the Fire Mountain neighborhood. The proposed project would develop 295 residential units and 3,000 square feet of commercial/retail within a 12.87-acre graded area within the approximately 18.9-acre project site, with the remaining 15-acres remaining as undeveloped open space. In addition, the project includes on and off-site utility improvements, S. Oceanside Boulevard roadway extension and Crouch Street roadway improvements, and landslide remediation.

Construction Noise

None of the proposed construction equipment will exceed the City of Oceanside 85 dBA standard at 150 feet from the source. The project will meet the City of Oceanside's 85 dBA standard at 150 feet from the source for all proposed equipment and no impacts are anticipated. No impacts will occur and no mitigation measures are required. Off-site construction would not occur directly adjacent to existing homes and the noise levels would not exceed the City's construction noise levels limits and no impacts are anticipated.

Construction Vibration

The Federal Transit Administration (FTA) has determined vibration levels that would cause annoyance to a substantial number of people and potential damage to building structures. The FTA criterion for vibration induced structural damage is 0.20 in/sec for the peak particle velocity (PPV). The FTA criterion for infrequent vibration induced annoyance is 80 Vibration Velocity (VdB) for residential uses.

The nearest vibration-sensitive uses are the residences located to the northeast, 200 feet or more from the proposed construction. The average vibration levels that would be experienced at the nearest vibration sensitive land uses to the east from temporary construction activities were found to be below 0.2 in/sec. Project construction activities would result in PPV levels below the FTA's criteria for vibration induced structural damage. Therefore, Project construction activities would not result in vibration induced structural damage to residential buildings near the demolition and construction areas. Construction activities were found to generate levels of vibration below 80 VdB and would not exceed the FTA criteria for nuisance for nearby residential uses. Therefore, vibration impacts would be less than significant.

Onsite Transportation Noise

Based upon the findings of the Buildout analysis, exterior noise from vehicular traffic onto the Project will be in compliance with the City of Oceanside's Noise Element and no impacts are anticipated at the outdoor usable areas and no mitigation measures are required. The proposed project is near the Oceanside Municipal Airport areas but is not within any of the noise contours due to infrequent aircraft over flights and therefore no mitigation to any structures or sensitive land uses is necessary due to aircraft.

The City of Oceanside 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 60 dBA CNEL in order to ensure a 45 dBA CNEL interior noise level. An interior noise assessment is required for the residential units along the roadways prior to the issuance of the first building permit once the architectural floor plans are available. This final report would identify the interior noise requirements to meet the City's established interior noise limit of 45 dBA CNEL. It should be noted; interior noise levels of 45 dBA CNEL can easily be obtained with conventional building construction methods and providing a closed window condition requiring a means of mechanical ventilation (e.g., air conditioning) for each building and upgraded windows for all sensitive rooms (e.g., bedrooms and living spaces).

Offsite Transportation Noise

The Project does create a cumulative noise increase of more than 3 dBA CNEL on segments of Crouch Street and S. Oceanside Boulevard. The project's contribution is only 0.6 dBA CNEL and therefore would not be a major contributor. The existing residences along this segment of roadway have a minimum of 5-foot barriers that will reduce the noise level at least 3-5 decibels or more depending on the elevation differences. Residences that are below or above the grade of the road will have further noise reductions due to the grade separation. The existing wall will reduce the roadway noise levels below the 60 dBA CNEL threshold. Therefore, the Project's direct contributions to off-site roadway noise increases will not cause any significant impacts to any existing or future noise sensitive land uses.

Onsite Train Vibration

Train vibration depends on the weight of the train, travel speed, the condition of the track and soil characteristics. The proposed project buildings would be more than 175 feet from the centerline of the tracks. Federal Transit Administration Transit Noise and Vibration Impact Assessment Manual (FTA 2018) predicts that freight train vibration levels are as high as 73 VdB at 175 feet from the track centerline for a locomotive-powered freight train traveling at speeds of 50 MPH and up to 62 VdB for commuter rail train events at that speed.

Therefore, the infrequent freight train activities will be below the 80 VdB, infrequent event for the freight train and the frequent commuter train activities will be below the 72 VdB frequent event annoyance thresholds as identified by the FTA. Additionally, due to the close proximity of the Transit Center, the commuter trains will be traveling at a slower speed of approximately 15 MPH, which would reduce the vibration levels 8 VdB and the freight train travel at speeds of 30 MPH or less which would reduce the vibration levels at least 4 VdB. Therefore, the train activities would have a less than significant impact on the proposed project.

Operational Noise Levels

The proposed operational noise levels are in compliance with the City's daytime and would also meet the most restrictive nighttime standard standards. No impacts are anticipated and no mitigation is required.

1.0 PROJECT INTRODUCTION

1.1 Purpose of this Study

The purpose of this Noise study is to determine any potential noise impacts due to the proposed construction and operations of the proposed project and also to determine potential noise impacts (if any) to the proposed project generated from offsite sources. Should impacts be determined, the intent of this study would be to recommend suitable mitigation measures to bring those impacts to a level that would be considered less then significant.

1.2 Project Location

The project site is located just south of the Crouch Light Rail Station or south of the intersection Skylark Drive and Crouch Street in Oceanside, in central coastal San Diego County. An existing single-family residential development lies south of the project site. A commercial office park is located west of the development and undeveloped land exists to the east.

The site is within walking/biking distance to Crouch Street Station (<0.1 miles), also retail shopping and food stores are located across Oceanside Boulevard a short walk north along Crouch Street. A general Project vicinity map is shown in Figure 1-A of this report.

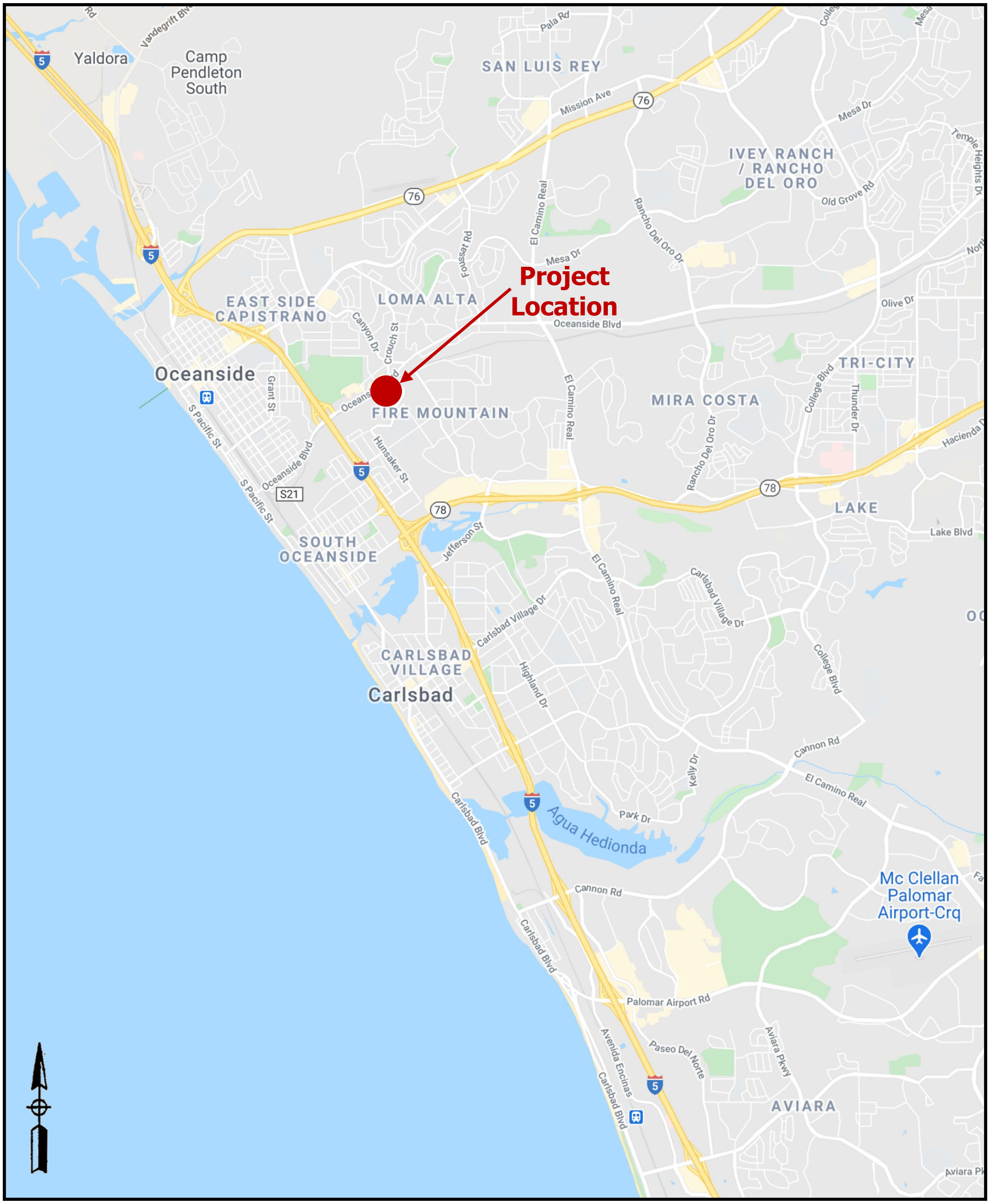
1.3 Project Description and Purpose

The proposed project includes 295 dwelling units of residential apartments and 3,000 square feet of specialty retail. The site is currently zoned Community Commercial (CC) and use permit is required to allow for up to 29 units per acre. Access to the project site will be along the future roadway of South Oceanside Boulevard which connects to the existing roads of Crouch Street and Union Plaza Court. The project site is 18.9 acres; however, extreme slopes exist to the south of the project site. Based on this, the developable area onsite is only 12.87 acres. The proposed site development plan is shown on Figure 1-B.

It is expected that the proposed project would begin construction in 2023 and be completed roughly two years later with full occupancy and operations expected in 2026. In addition, the project includes on- and off-site utility improvements, S. Oceanside Boulevard roadway extension and Crouch Street improvements.

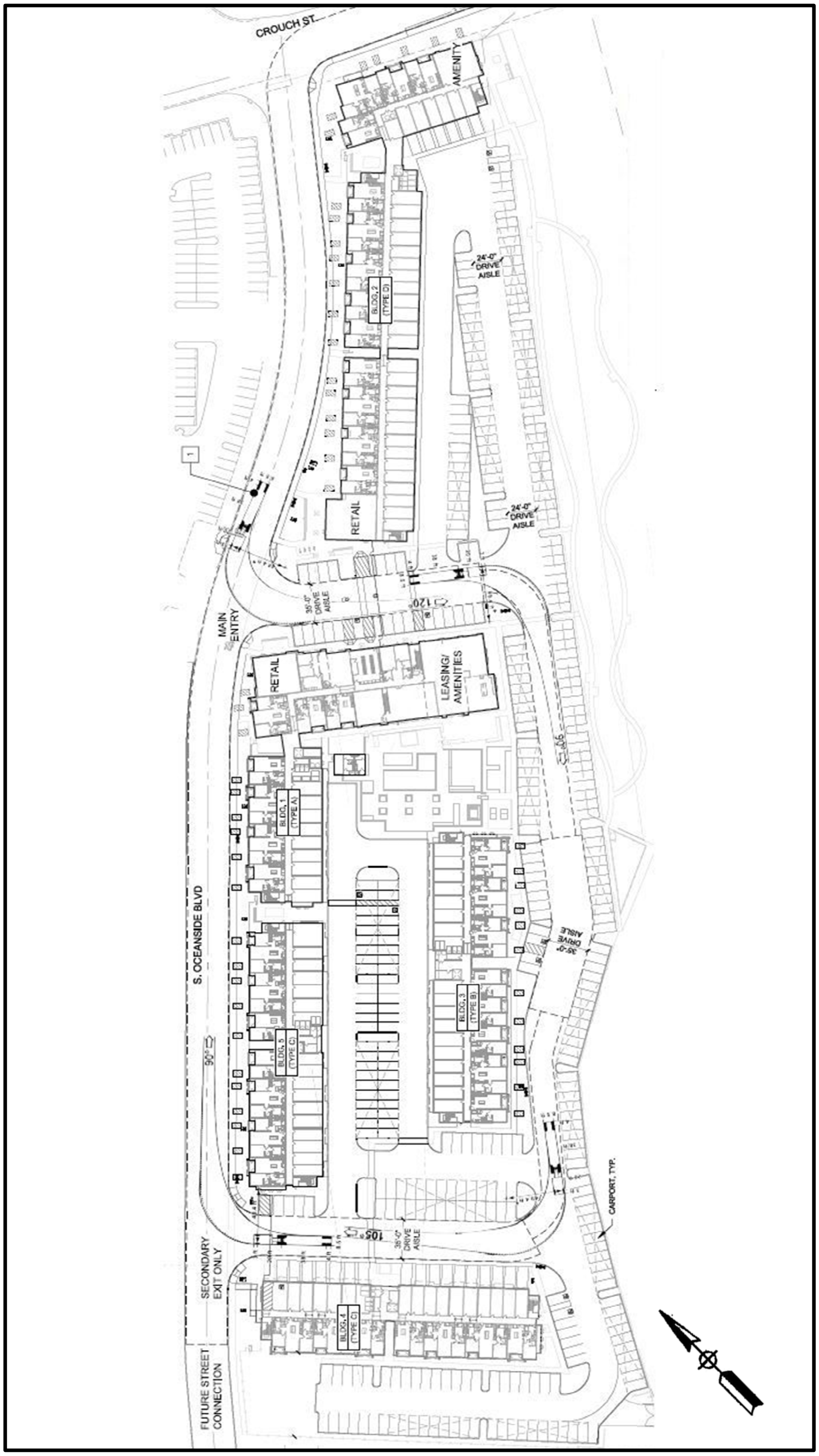
As part of the City's Housing Element the Community Commercial use allows for a density of up to 29 Units per gross acre and estimates that the project could be developed with as many as 305 units (City of Oceanside, 2013). The project site has been designed to have a density of 22.9 units per acre with some retail.

Figure 1-A: Project Vicinity Map



Source: Google Maps, 3/21

Figure 1-B: Project Configuration



Source: Architecture Design Collaborative, 2022

2.0 FUNDAMENTALS

2.1 Acoustical Fundamentals

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 Leq 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 or penalties 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 sounds appear louder.

A vehicles noise level is generated from a combination of 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 radiant 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 it 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.

2.2 Vibration Fundamentals

Vibration is a trembling or oscillating motion of the ground. Like noise, vibration is transmitted in waves, but in this case through the ground or solid objects. Unlike noise, vibration is typically felt rather than heard. Vibration can be either natural as in the form of earthquakes, volcanic eruptions, or manmade as from explosions, heavy machinery, or trains. Both natural and manmade vibration may be continuous, such as from operating machinery; or infrequent, as from an explosion.

As with noise, vibration can be described by both its amplitude and frequency. Amplitude may be characterized in three ways: displacement, velocity, and acceleration. Particle displacement is a measure of the distance that a vibrated particle travels from its original position and for the purposes of soil displacement is typically measured in inches or millimeters. Particle velocity is the rate of speed at which soil particles move in inches per second or millimeters per second. Particle acceleration is the rate of change in velocity with respect to time and is measured in inches per second or millimeters per second. Typically, particle velocity (measured in inches or millimeters per second) and/or acceleration (measured in gravities) are used to describe vibration. Table 2-1 shows the human reaction to various levels of peak particle velocity.

Vibrations also vary in frequency and this affects perception. Typical construction vibrations fall in the 10 to 30 Hz range and usually occur around 15 Hz. Traffic vibrations exhibit a similar range of frequencies; however, due to their suspension systems, it is less common, to measure traffic frequencies above 30 Hz.

Propagation of ground-borne vibrations is complicated and difficult to predict because of the endless variations in the soil through which the waves travel. There are three main types of vibration propagation: surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wave front, similar to ripples produced by dropping an object into water. P-waves, or compression waves, are waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wave front. However, unlike P-waves, the particle motion is transverse, or side-to-side and perpendicular to the direction of propagation.

As vibration waves propagate from a source, the energy is spread over an ever-increasing area such that the energy level is reduced with the distance from the energy source. This geometric spreading loss is inversely proportional to the square of the distance. Wave energy is also reduced with distance as a result of material damping in the form of internal friction, soil layering, and special voids. The amount of attenuation provided by material damping varies with soil type and condition as well as the frequency of the wave.

Table 2-1: Human Reaction to Typical Vibration Levels

Vibration Level Peak Particle Velocity (in/sec)	Human Reaction	Effect on Buildings
0.006–0.019	Threshold of perception, possibility of intrusion	Vibrations unlikely to cause damage of any type
0.08	Vibrations readily perceptible	Recommended upper level of vibration to which ruins and ancient monuments should be subjected
0.10	Level at which continuous vibration begins to annoy people	Virtually no risk of "architectural" (i.e., not structural) damage to normal buildings
0.20	Vibrations annoying to people in buildings	Threshold at which there is a risk to "architectural" damage to normal dwelling – houses with plastered walls and ceilings
0.4–0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause "architectural" damage and possibly minor structural damage

Source: Caltrans, Division of Environmental Analysis, *Transportation Related Earthborne Vibration, Caltrans Experiences*, Technical Advisory, Vibration, TAV-02-01-R9601, 2002.

3.0 SIGNIFICANCE THRESHOLDS AND STANDARDS

3.1 Construction Noise and Vibration

The City of Oceanside Noise Element controls noise levels due to construction operations. It shall be unlawful for any person to operate construction equipment at any construction site, except as outlined in subsections (a) and (b) below:

(a) It shall be unlawful for any person to operate any construction equipment at a level in excess of 85 dBA at 100 feet from the source.

(b) It should be unlawful for any person to engage in construction activities between 6 PM and 7 AM when such activities exceed the ambient noise level by 5 dBA. A special permit may be granted by the Director of Public Works if extenuating circumstances exist.

The City of has not yet adopted vibration criteria. The United States Department of Transportation Federal Transit Administration (FTA) provides criteria for acceptable levels of groundborne vibration for various types of special buildings that are sensitive to vibration. For purposes of identifying potential project-related vibration impacts, the FTA criteria will be used. The human reaction to various levels of vibration is highly subjective. The upper end of the range shown for the threshold of perception, or roughly 65 VdB, may be considered annoying by some people. Vibration below 65 VdB may also cause secondary audible effects, such as a slight rattling of doors, suspended ceilings/fixtures, windows, and dishes, any of which may result in additional annoyance. Table 3-1 shows the FTA groundborne vibration and noise impact criteria for human annoyance.

Table 3-1: Groundborne Vibration and Noise Impact Criteria (Human Annoyance)

	Groundborne Vibration Impact Levels (VdB re 1 microinch/second)			Groundborne Noise Impact Levels (dB re 20 micropascals)		
	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]	Frequent Events[1]	Occasional Events[2]	Infrequent Events[3]
Category 1: Buildings where low ambient vibration is essential for interior operations.	65 VdB[4]	65 VdB[4]	65 VdB[4]	N/A[4]	N/A[4]	N/A[4]
Category 2: Residences and buildings where people normally sleep.	72 VdB	75 VdB	80 VdB	35 dBA	38 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime use.	75 VdB	78 VdB	83 VdB	40 dBA	43 dBA	48 dBA

Source: United States Department of Transportation Federal Transit Administration (FTA), *Transit Noise and Vibration Impact Assessment,* June 2006.

[1] "Frequent Events" are defined as more than 70 vibration events per day. Most rapid transit projects fall into this category.

[2] "Occasional Events" are defined as between 30 and 70 vibration events of the same source per day. Most commuter truck lines have this many operations.

[3] "Infrequent Events" are defined as fewer than 30 vibration events of the same kind per day. This category includes most commuter rail branch lines

[4] 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 the acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.

[5] Vibration-sensitive equipment is not sensitive to groundborne noise.

In addition to the vibration annoyance standards presented above, the FTA also applies the following standards for construction vibration damage. Table 3-2 on the following page, structural damage is possible for typical residential construction when the peak particle velocity (PPV) exceeds 0.2 inch per second (in/sec). This criterion is the threshold at which there is a risk of damage to normal dwellings.

In the context of this analysis, the noise and vibration impacts associated with the construction operations will be conditioned to comply with the thresholds stated above. The potential noise and vibration impacts are analyzed separately below.

Table 3-2: Groundborne Vibration Impact Criteria (Structural Damage)

Building Category	PPV (in/sec)	VdB
I. Reinforced-concrete, steel, or timber (no plaster)	0.5	102
II. Engineered concrete and masonry (no plaster)	0.3	98
III. Non-engineered timber and masonry buildings	0.2	94
IV. Buildings extremely susceptible to vibration damage	0.12	90

Source: United States Department of Transportation Federal Transit Administration (FTA), *Transit Noise and Vibration Impact Assessment,* June 2006.

3.2 Transportation Related Noise

The City of Oceanside's Noise Element requires that all exterior sensitive areas shall limit noise exposure. For noise sensitive residential land uses, the City has adopted a policy which has established a "normally acceptable" exterior noise level goal of 65 dBA CNEL for the outdoor areas and an interior noise level of less than 45 dBA CNEL.

Interior noise levels should be mitigated to a maximum of 45 dBA CNEL in all habitual rooms when the exterior of the residence are exposed to levels of 60 dBA CNEL or more. If windows and doors are required to be closed to meet the interior noise standard, then mechanical ventilation shall be provided per City requirements.

3.3 Operational Noise

Fixed sources and operational noise standards are governed by the City of Oceanside Noise Ordinance Section 38.12. Except for exempted activities and sounds as provided in this chapter or exempted properties as referenced in Section 38.15. 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 in the applicable base district zone on which the sound is produced exceeds the applicable limits set forth below in Table 3-3.

Table 3-3: Sound Level Limits

Base District Zone	7:00 a.m. to 9:59 p.m.	10:00 p.m. to 6:59 a.m.
(1) Residential Districts:		
RE (Residential Estate)	50	45
RS (Single-Family)	50	45
RM (Medium Density)	50	45
RH (High Density)	55	50
RT (Residential Tourist)	55	50
(2) C (Commercial)	65	60
(3) I (Industrial)	70	65
(4) D (Downtown)	65	55
(5) A (Agricultural)	50	45
(6) OS (Open Space)	50	45

In addition to the sound level limits established above, there are established sound level limits for PD (planned development) base district zones. For any residential land use within a PD zone, the sound level limit is that limit which would be otherwise applicable in the residential district zone (RE, RS, RM, RH or RT) corresponding to density of the residential development in that PD zone.

For any nonresidential land use within a PD zone, the sound level limit is that limit corresponding to the C (commercial) or I (industrial) zone which would be applicable to that use if not subject to the PD zone. For the purposes of this section, a land use shall be that use shown on a duly approved planned development plan or specific plan.

When property lines form the joint boundary of two (2) base district zones, the sound level limit shall be the arithmetic mean of the limit applicable to each of the two (2) zones.

4.0 CONSTRUCTION NOISE AND VIBRATION

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 and 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.

Because the City of Oceanside does not have property line standards for construction, the City of San Diego 75 dBA Leq standard is utilized in the analysis. Division 4 of Article 9.5 of the City of San Diego Municipal Code addresses the limits of disturbing or offensive construction noise. The Municipal Code states that with the exception of an emergency, it should be unlawful to conduct any construction activity so as to cause, at or beyond the property lines of any property zoned residential, an average sound level greater than 75 decibels during the 12–hour period from 7:00 a.m. to 7:00 p.m.

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 approximately 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.

Using a point-source noise prediction model, calculations of the expected construction noise levels were completed. The essential model input data for these performance equations include the source levels of the equipment, source to receiver horizontal and vertical separations, the amount of time the equipment is operating in a given day (also referred to as the duty-cycle), and any transmission loss from topography or barriers.

4.1 Potential Construction Noise Impact

Based on the EPA noise emissions, empirical data and the amount of equipment needed, worst-case noise levels from the construction equipment operations would occur during the base operations (grading/site preparation) and landslide remediation. Based upon the proposed site plan, the majority of the construction operations will occur more than 300 feet from the nearest property lines.

Therefore, the worst-case noise condition would occur when the construction equipment is working in close proximity to each other at an average distance of approximately 150 feet from the property lines. The noise levels utilized in this analysis are shown in Table 4-1. The amount of time the equipment will be utilized over an 8-hour period at this distance from the property line is also given and factored into the average noise level calculations. This is referred to as the duty-cycle.

Table 4-1: Construction Noise Levels

Equipment Type	Quantity Used	Source @ 50 Feet (dBA)	Cumulative Noise Level @ 50 Feet (dBA)
Dozer	2	74	8
Scraper	2	75	8
Excavator	1	72	8
Compactor	1	74	8
Grader	1	73	8
Backhoe	1	72	8
Water Truck	1	70	8
		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**

Off-site construction would also be required for off-site utility improvements, S. Oceanside Boulevard roadway extension and Crouch Street roadway improvement. Excavation and utility improvements equipment would generate similar noise levels as roadway improvements and the amount of equipment utilized would be limited due to alignment and work area constraints. Based on a construction area of approximately 50 feet by 300 feet, the average hourly off site construction noise levels would be approximately 75 dBA Leq at the edge of the roadway right-a-way and 72 dBA Leq or lower at 50 feet from the edge of roadway construction. During maximum effort with several pieces of equipment operating at the same time in close proximity or during excavation, maximum noise levels of 76-80 dBA Lmax may be experienced but would dimmish at local residences. The off-site construction would not occur directly adjacent to existing homes and the noise levels would not exceed the City's construction noise levels limits and no impacts are anticipated.

4.2 Construction Noise Conclusions

As can be seen in Table 4-1, none of the proposed equipment will exceed the City of Oceanside 85 dBA standard at 150 feet from the source. The project will meet the City of Oceanside's 85 dBA standard at 150 feet from the source for all proposed equipment and no impacts are anticipated. Accordingly, impacts will be less than significant and no mitigation measures are required. Off-site construction would not occur directly adjacent to existing homes and the noise levels would not exceed the City's construction noise levels limits and no impacts are anticipated.

4.3 Construction Vibration Findings

The nearest vibration-sensitive uses are the residences to the south located 200 feet or more from the proposed construction. The anticipated construction equipment will be spread out over the site working in different portion of the site as needed. For example: a single dozer may be utilized near the project boundary while the other equipment is working on the opposite side of the site. Table 4-2 lists the average vibration levels that would be experienced at the nearest vibration sensitive land uses from the temporary construction activities. Vibration levels were assessed at a distance of 50 feet to be conservative.

Table 4-2: Vibration Levels from Construction Activities (Residential Receptors)

Equipment	Approximate Velocity Level at 25 Feet (VdB)	Approximate RMS Velocity at 25 Feet (in/sec)	Approximate Velocity Level at 50 Feet (VdB)	Approximate RMS Velocity at 50 Feet (in/sec)
Small bulldozer	58	0.003	49.0	0.0011
Jackhammer	79	0.035	70.0	0.0124
Loaded trucks	86	0.076	77.0	0.0269
Large bulldozer	87	0.089	78.0	0.0315
		FTA Criteria	80	0.2
		Significant Impact?	**No**	**No**
[1] PPV at Distance D = PPVref x $(25/D)^{1.5}$				

The FTA has determined vibration levels that would cause annoyance to a substantial number of people and potential damage to building structures. The FTA criterion for vibration induced structural damage is 0.20 in/sec for the peak particle velocity (PPV). Project construction activities would result in PPV levels below the FTA's criteria for vibration induced structural damage. Therefore, project construction activities would not result in vibration induced structural damage to residential buildings near the demolition and construction areas. The FTA criterion for infrequent vibration induced annoyance is 80 Vibration Velocity (VdB) for residential uses. Construction activities would generate levels of vibration that would not exceed the FTA criteria for nuisance for nearby residential uses. Therefore, vibration impacts would be less than significant.

4.4 Vibration Findings

Given attenuation of vibration velocities with distance, the RMS vibration velocity and peak particle velocity at the nearest existing residence would be about 78 VdB and 0.03 inch per second, respectively. Based on the construction vibration human annoyance criterion of 80 VdB published by the FTA, the vibration levels for the construction activity on nearby residential structures will not be significant.

5.0 TRANSPORTATION NOISE

5.1 Existing Noise Environment Onsite

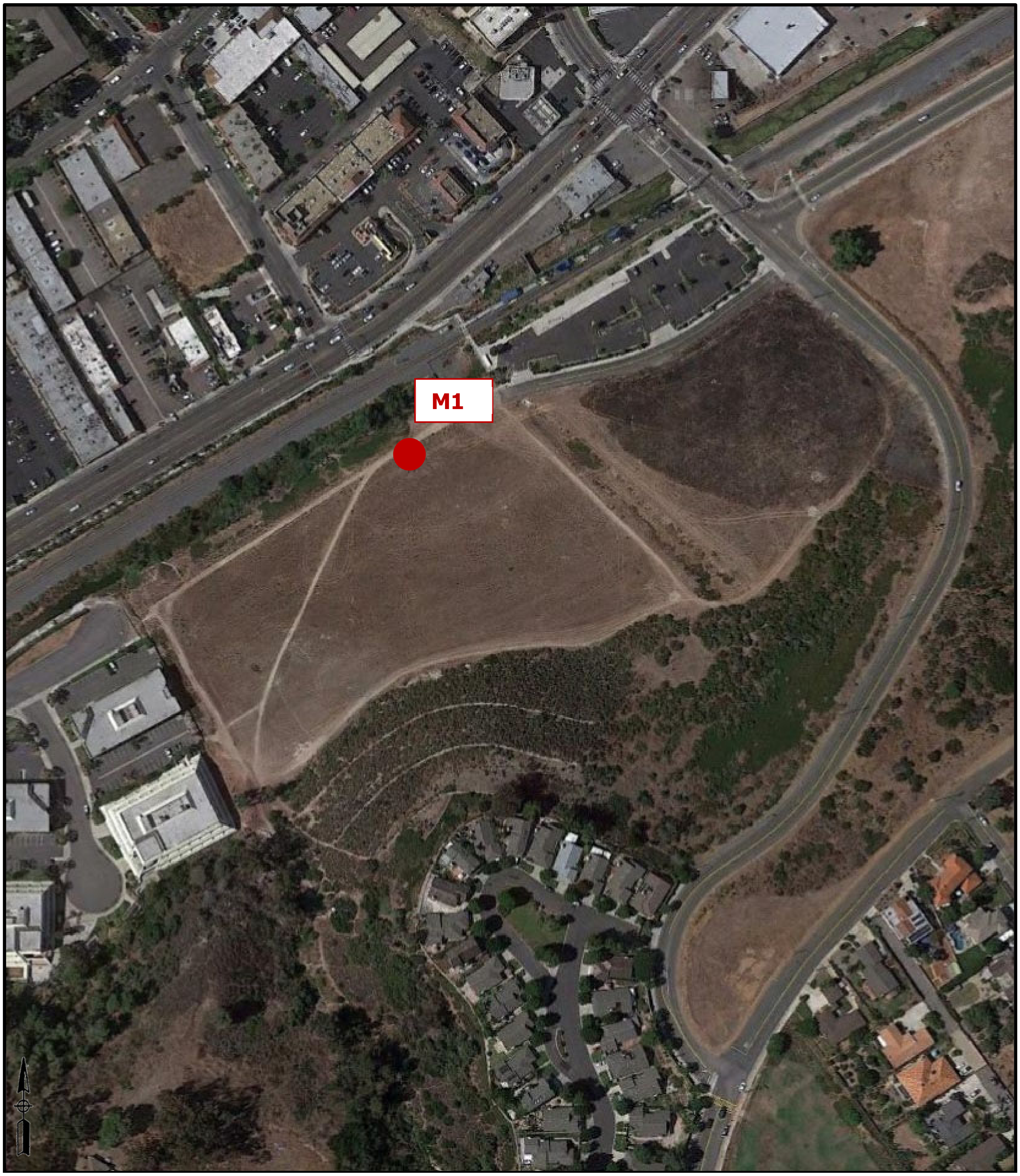
Noise measurements were taken January 13, 2021 in the midday hours using a Larson-Davis Model LxT Type 1 precision sound level meter, programmed, in "slow" mode, to record noise levels in "A" weighted form. The sound level meter and microphone were mounted on a tripod, five feet above the ground and 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.

Monitoring location 1 (ML1) was located along the proposed extension of S. Oceanside Boulevard. The result of the noise level measurements are presented in Table 5-1. The noise measurements were monitored for a time period of 15 minutes during normal traffic conditions. The existing noise levels in the project area consisted primarily of traffic from nearby Oceanside Boulevard. The ambient Leq noise level measured in the area of the project during the midday hours was found to be roughly 63 dBA Leq. The statistical indicators Lmax, Lmin, L10, L50 and L90, are given for the monitoring location. As can be seen from the L90 data, 90% of the time the noise level is 58 dBA from roadway activity. The noise monitoring location is provided graphically in Figure 5-A on the following page.

Table 5-1: Measured Ambient Noise Levels

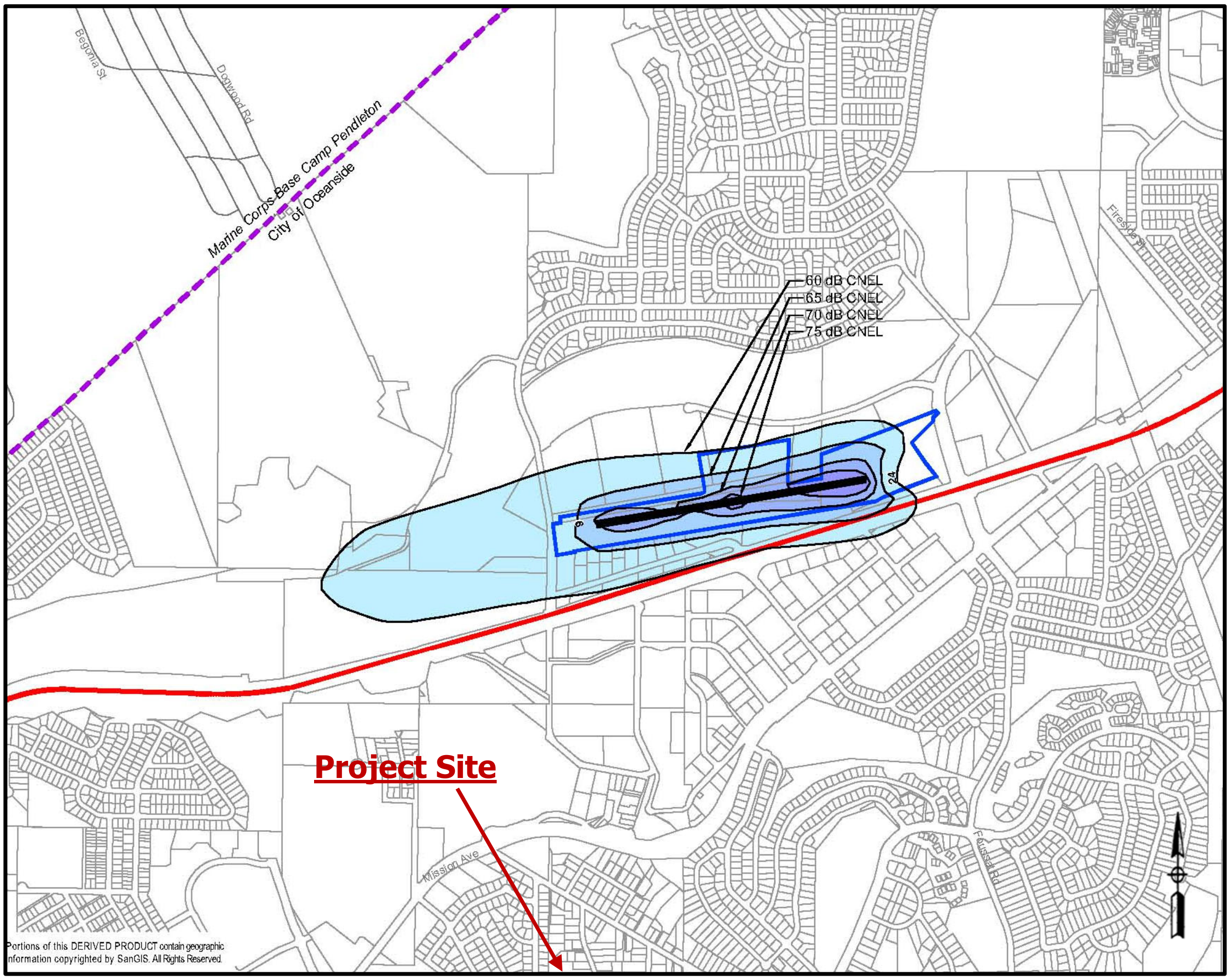
Measurement Identification	Main Noise Source	Time	Noise Levels (dBA)					
			Leq	Lmin	Lmax	L10	L50	L90
M1	Oceanside Boulevard	2:45–3:00 p.m.	63.2	57.1	74.6	64.6	58.6	57.5
Source: Ldn Consulting, Inc. January 13, 2021								

Figure 5-A: Ambient Monitoring Locations



The proposed project is located over 1.5 miles from the Oceanside Municipal Airport but is not within any of the noise contours due to infrequent aircraft over flights and therefore no mitigation to any structures or sensitive land uses is necessary due to aircraft. Noise from the Oceanside Municipal Airport would not be expected to exceed 65 dBA CNEL and therefore no mitigation to any structures or sensitive land uses due to aircraft is required. The project site location is not visible on the noise contour map of the Oceanside Municipal Airport as can be seen in Figure 5-B below.

Figure 5-B: Oceanside Municipal Airport Noise Contours/Project Location



Source: Oceanside Municipal ACLUP, 2010

5.2 Future Onsite Noise Prediction

To determine the future noise environment and impact potentials the 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. The peak hour traffic volumes range between 6-12% of the average daily traffic (ADT) and 10% is generally acceptable for noise modeling. Table 5-2 presents the roadway parameters used in the analysis including the peak traffic volumes, vehicle speeds and the hourly traffic flow distribution (vehicle mix). The vehicle mix provides the hourly distribution percentages of automobile, medium trucks and heavy trucks for input into the FHWA Model. The Buildout conditions are provided by Urban Systems Associates, Inc. (Source: Jefferson Oceanside Transportation Impact Analysis – Urban Systems Associates, Inc., March 2021).

Table 5-2: Future Traffic Parameters

Roadway	Average Daily Traffic (ADT)[1]	Peak Hour Volumes[1]	Modeled Speeds (MPH)	Vehicle Mix %[2]		
				Auto	Medium Trucks	Heavy Trucks
Oceanside Boulevard	13,700	1,370	35	96	2	2
S Oceanside Boulevard	9,234	923	35	96	2	2
Crouch Street	9,367	937	25	96	2	2

[1] Source: Urban Systems Associates, Inc., 2021
[2] Typical vehicle mix

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 results of the specific noise modeling are provided in and Table 5-3 and Figure 5-D. Additionally, three decibels of attenuation is allowed for the first row of buildings when they block 40 to 65% of the line of sight to the noise source, and three to five decibels of attenuation is allowed when the buildings obstruct more than 65% of the line of sight (Source: CALTRANS Technical Noise Supplement Section N-5515). Outdoor usable space would be provided by the proposed pool area located behind the leasing amenity. It was determined that the outdoor noise levels are expected to be as high as 61 dBA CNEL at the pool area and would comply with the City's noise standard and no additional mitigation is required. Additionally, line of sight to the roadways from the pool area are blocked by the existing and proposed structures by more than 40%, therefore a factor of 3 dBA was taken into account. The modeled observer locations are represented in Figure 5-C.

Figure 5-C: Modeled Receptor Locations

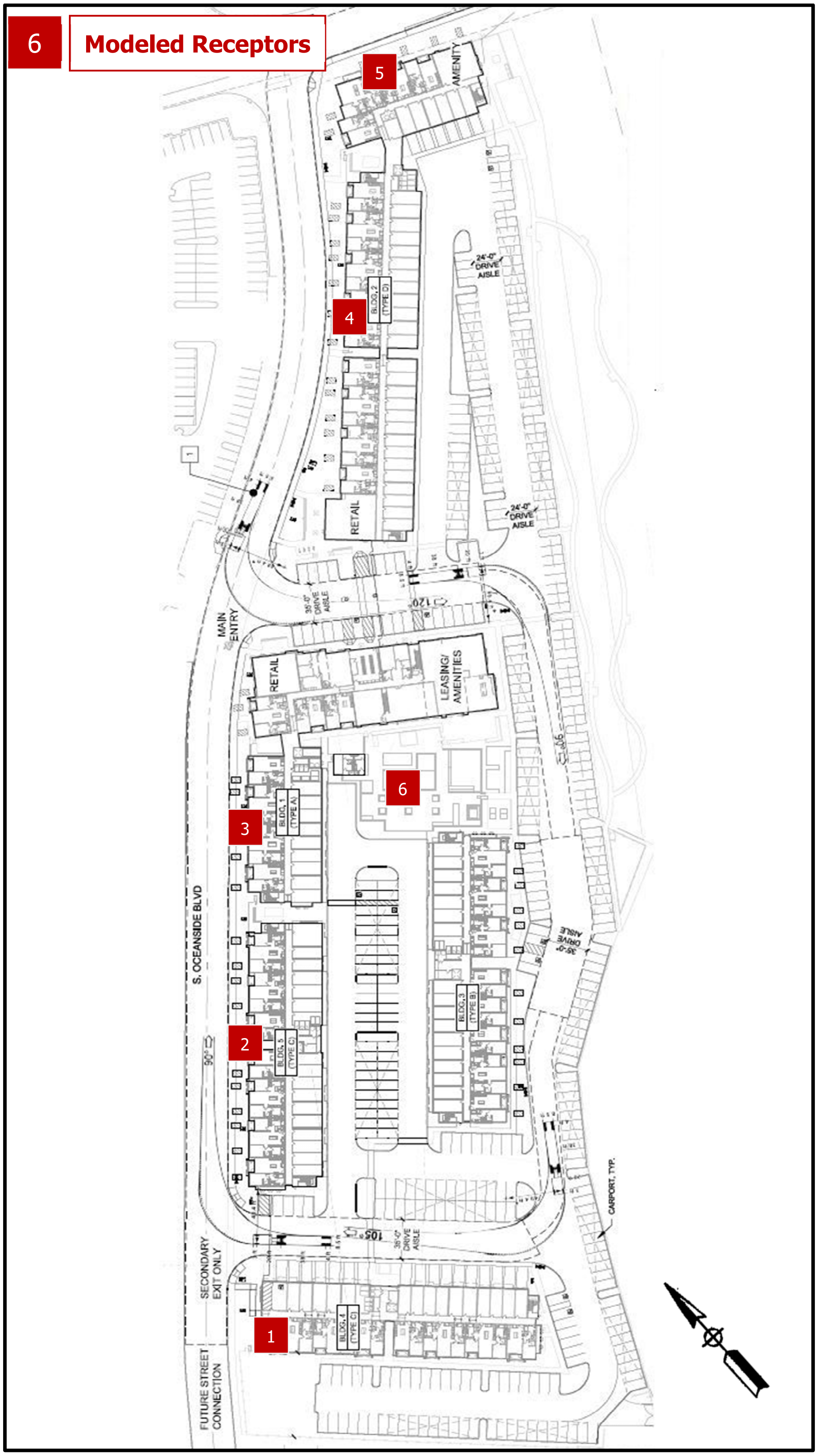


Figure 5-D: Future Exterior Noise Levels

Project Name:	Jefferson	Date:	26-Mar-21
Project Number:	19-128	Location:	City of Oceanside

Traffic Volumes, Mix and Speeds

	Autos	Med. Trucks	Heavy Trucks
Mix Ratio by Percent	96.0	2.0	2.0
Propagation Rule	Soft		

Roadway	ADT	Speed MPH	CNEL @ 50 Feet	60 CNEL (Feet)
Oceanside Boulevard	13,700	35	68.3	178
S. Oceanside Boulevard	9,234	35	66.5	136
Crouch Street	9,367	25	64.6	102

Noise Reduction due to Distance

	Distance	Reduction	Resultant Level
Oceanside Boulevard	360	-12.86	55.4
S. Oceanside Boulevard	150	-7.16	59.4
Crouch Street	600	-16.19	48.4

Cumulative Noise Level **61.1** **dBA CNEL**

Table 5-3: Future Exterior Noise Levels

Receptor Number	Receptor Location	Noise Level @ Receptor (dBA CNEL) [1]	Reduction Due to Shielding (dBA CNEL)	Resultant Building Façade Noise Level (dBA CNEL)
1	Building 1 Facade	69	-	69
2	Building 2 Facade	69	-	69
3	Building 3 Facade	69	-	69
4	Building 4 Facade	69	-	69
5	Building 5 Facade	70	-	70
6	Pool	61	-3.0	58

[1] FHWA Highway Traffic Noise Prediction Model, FHWA-RD-77-108

5.3 Onsite Rail Line Noise

The proposed Project is located a minimum of 175 feet from the San Diego Northern Railroad (SDNR) consisting of Sprinter service operated by the NCTD. According to a previous noise study, the future noise level from the railway is expected to be as high as 63.3 dBA CNEL at 140-feet (Source: Ocean Creek Town Center Acoustical Analysis Report – Eilar Associates, July 27, 2004). The analysis was based on an average of 64 daily trips at an estimated speed of 25 mph and includes infrequent (twice a week) freight trains. Due to fluctuations in train schedules, to be conservative, a noise level of 65.0 dBA CNEL was used in this analysis.

5.4 Cumulative Onsite Noise Levels and Findings

Outdoor use areas and building facades were modeled to determine if shielding/mitigation is required to reduce the noise levels below the City's 65 dBA CNEL threshold. The noise levels determined for the roadway and train activities were combined to determine the overall cumulative noise levels at the proposed receptors. The resultant cumulative noise levels from the traffic and train activities are provided below in Table 5-4 for the outdoor use areas and the building facades. The proposed outdoor pool area would be shielded by the roadways and railway by the proposed buildings and therefore was found to comply with the City of Oceanside Noise standards of 65 dBA CNEL at the multi-family residences and outdoor useable areas.

Table 5-4: Combined Future Exterior Noise Levels

Receptor Number	Receptor Location	Unmitigated Noise Levels from all Sources (dBA CNEL)
1	Building 1 Facade	71
2	Building 2 Facade	71
3	Building 3 Facade	71
4	Building 4 Facade	71
5	Building 5 Facade	71
6	Pool	64

[1] Interior Noise Study required per City Guidelines if building façade is above 60 dBA CNEL.

Additionally, a final noise assessment is required prior to the issuance of the first building permit since the building facades are above 60 dBA CNEL. This final report would identify the interior noise requirements based upon architectural and building plans to meet the City's established interior noise limit of 45 dBA CNEL. It should be noted; interior noise levels of 45 dBA CNEL can easily be obtained with conventional building construction methods and providing a closed window condition requiring a means of mechanical ventilation (e.g., air conditioning) for each building and upgraded windows for all sensitive rooms (e.g., bedrooms and living spaces).

5.5 Project Related Offsite Transportation Noise

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.

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 radiant 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. Hard site conditions, to be conservative, were used to develop the noise contours and analyze noise impacts along all roadway segments. The future traffic noise model utilizes a typical, conservative vehicle mix of 96% Autos, 2% Medium Trucks and 2% Heavy Trucks for all analyzed roadway segments. The vehicle mix provides the hourly distribution percentages of automobile, medium trucks and heavy trucks for input into the FHWA Model.

Community noise level changes greater than 3 dBA are often identified as audible and considered potential significant, while changes less than 1 dBA will not be discernible to local residents. In the range of 1 to 3 dBA, residents who are very sensitive to noise may perceive a slight change. There is no scientific evidence available to support the use of 3 dBA as the significance threshold. Community noise exposures are typically over a long time period rather than the immediate comparison made in a laboratory situation. Therefore, the level at which changes in community noise levels become discernible is likely greater than 1 dBA and 3 dBA appears to be appropriate for most people. For the purposes for this analysis a 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 the project increases noise levels above an unacceptable noise level per the City's General Plan in the area adjacent to the roadway segment.

<u>Direct Noise Impacts</u>

To determine if direct off-site noise level increases associated with the development of the Project will create noise impacts. The noise levels for the existing conditions were compared with the noise level increase from the Project. Utilizing the Project's traffic assessment (Source: Urban Systems Associates, Inc., 2021) noise contours were developed for the following traffic scenarios:

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

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

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

The noise levels and reference distances to the 60 dBA CNEL contours for the roadways in the vicinity of the Project site are given in Table 5-5 for the Existing Scenario and in Table 5-6 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 5-7 presents the comparison of the Existing Year with and without Project related noise levels. The overall roadway segment noise levels will increase from 0.0 to 1.6 dBA CNEL with the development of the Project. The Project does not create a direct noise increase of more than 3 dBA CNEL on any roadway segment. Therefore, the Project's direct contributions to off-site roadway noise increases will not cause any significant impacts to any existing or future noise sensitive land uses.

Table 5-5: Existing Noise Levels

Roadway	Roadway Segment	ADT[1]	Vehicle Speeds (MPH)[1]	Noise Level @ 50-Feet (dBA CNEL)	60 dBA CNEL Contour Distance (Feet)
Oceanside Boulevard	I-5 SB Ramps to I-5 NB Ramps	20,100	40	70.2	238
	I-5 NB Ramps to State Tree Dr	31,213	35	70.9	265
Crouch Street	Oceanside Blvd to Grandview St	3,800	25	59.7	48
S. Oceanside Boulevard	Commerce St to State Tree Dr	4,200	35	62.2	70
	East of State Tree Dr	4,300	35	62.3	71
[1] Source: Project Traffic study prepared by Urban Systems Associates, Inc., 2021					

Table 5-6: Existing + Project Noise Levels

Roadway	Roadway Segment	ADT[1]	Vehicle Speeds (MPH)[1]	Noise Level @ 50-Feet (dBA CNEL)	60 dBA CNEL Contour Distance (Feet)
Oceanside Boulevard	I-5 SB Ramps to I-5 NB Ramps	21,484	40	70.5	249
	I-5 NB Ramps to State Tree Dr	31,982	35	71.0	269
Crouch Street	Oceanside Blvd to Grandview St	5,030	25	60.9	58
S. Oceanside Boulevard	Commerce St to State Tree Dr	5,123	35	63.0	79
	East of State Tree Dr	6,145	35	63.8	90
[1] Source: Project Traffic study prepared by Urban Systems Associates, Inc., 2021					

Table 5-7: Existing vs. Existing + Project Noise Levels

Roadway	Roadway Segment	Existing Noise Level @ 50-Feet (dBA CNEL)	Existing Plus Project Noise Level @ 50-Feet (dBA CNEL)	Project Related Noise Level Increase (dBA CNEL)
Oceanside Boulevard	I-5 SB Ramps to I-5 NB Ramps	70.2	70.5	0.3
	I-5 NB Ramps to State Tree Dr	70.9	71.0	0.1
Crouch Street	Oceanside Blvd to Grandview St	59.7	60.9	1.2
S. Oceanside Boulevard	Commerce St to State Tree Dr	62.2	63.0	0.9
	East of State Tree Dr	62.3	63.8	1.6

Cumulative Noise Impacts

To determine if cumulative off-site noise level increases associated with the development of the Project and if ambient growth 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: Urban Systems Associates, Inc. 2021) noise contours were developed for the following traffic scenarios:

> Existing: Current day noise conditions without construction of the project.
>
> Existing Plus Ambient Growth Plus Project: Current day noise conditions plus the completion of the project and ambient growth factors.
>
> Existing vs. Existing Plus Ambient Growth Plus Project: Comparison of the existing noise levels and the related noise level increases from the combination of the project and ambient growth in the vicinity of the site.

The existing noise levels and reference distances to the 60 dBA CNEL contours for the roadways in the vicinity of the Project site are given in Table 5-5 above for the Existing Scenario. The near-term cumulative noise conditions are provided in Table 5-8. No noise barriers or topography that may affect noise levels were incorporated in the calculations.

Table 5-9 presents the comparison of the Existing Year and the Near-Term Cumulative noise levels. The overall roadway segment noise levels will decrease 0.2 to 2.0 dBA CNEL with the development of the Project and ambient growth. Therefore, no impacts are anticipated.

Table 5-8: Existing + Project + Ambient Growth Noise Levels

Roadway	Roadway Segment	ADT[1]	Vehicle Speeds (MPH)[1]	Noise Level @ 50-Feet (dBA CNEL)	60 dBA CNEL Contour Distance (Feet)
Oceanside Boulevard	I-5 SB Ramps to I-5 NB Ramps	21,219	40	70.4	247
	I-5 NB Ramps to State Tree Dr	39,209	35	71.9	308
Crouch Street	Oceanside Blvd to Grandview St	5,690	25	61.5	63
S. Oceanside Boulevard	Commerce St to State Tree Dr	5,852	35	63.6	87
	East of State Tree Dr	6,892	35	64.3	97
[1] Source: Project Traffic study prepared by Urban Systems Associates, Inc., 2021					

Table 5-9: Existing vs. Existing + Project + Ambient Growth Noise Levels

Roadway	Roadway Segment	Existing Noise Level @ 50-Feet (dBA CNEL)	Existing Plus Project Noise Level @ 50-Feet (dBA CNEL)	Project Related Noise Level Increase (dBA CNEL)
Oceanside Boulevard	I-5 SB Ramps to I-5 NB Ramps	70.2	70.4	0.2
	I-5 NB Ramps to State Tree Dr	70.9	71.9	1.0
Crouch Street	Oceanside Blvd to Grandview St	59.7	61.5	1.8
S. Oceanside Boulevard	Commerce St to State Tree Dr	62.2	63.6	1.4
	East of State Tree Dr	62.3	64.3	2.0

5.6 Train Vibration

Train vibration depends on the weight of the train, travel speed, the condition of the track and soil characteristics. The proposed project buildings would be more than 175 feet from the centerline of the tracks. Federal Transit Administration Transit Noise and Vibration Impact Assessment Manual (FTA 2018) predicts that freight train vibration levels are as high as 73 VdB at 175 feet from the track centerline for a locomotive-powered freight train traveling at speeds of 50 MPH and up to 62 VdB for commuter rail train events at that speed.

Therefore, the infrequent freight train activities will be below the 80 VdB, infrequent event for the freight train and the frequent commuter train activities will be below the 72 VdB thresholds as identified in Category 2 of Table 3-1. Additionally, due to the close proximity of the Transit Center, the commuter trains will be traveling at a slower speed of approximately 15 MPH, which would reduce the vibration levels 8 VdB and the freight train travel at speeds of 30 MPH or less which would reduce the vibration levels at least 4 VdB. Therefore, the train activities would have a less than significant impact on the proposed project.

6.0 OPERATIONAL NOISE

This section examines the potential operational noise source levels associated with the development and operation of the proposed project. Noise from a fixed or point source drops off at a rate of 6 dBA for each doubling of distance. Which means a noise level of 70 dBA at 5-feet would be 64 dBA at 10-feet and 58 dBA at 20-feet. A review of the proposed project indicates that noise sources from the mechanical ventilation system (HVAC) are the primary sources of stationary noise and normal residential activities.

Each unit will have a rooftop-mounted HVAC unit for temperature control and are discussed in more detail below. The most sensitive property lines to the operational noise sources, by distance and orientation, is the property line at the existing single family homes to the south. The remainder of the surrounding residential uses are located farther from the proposed HVAC units. The section will analyze the property line to determine the worst case noise levels. All other property lines are located further from the noise sources or have less restrictive property line limits.

The required sound levels at a Project's property boundary depend on the time of day and the land use zone. The Project site is zoned for high-density residential, which allows an equivalent one-hour sound level of 55 dBA Leq-h between 7 A.M. and 9:59 P.M. and 50 dBA from 10 P.M. to 6:59 A.M at the property lines. The western and eastern properties are zoned commercial professional. The existing residential uses located to the south allow an equivalent one-hour sound level of 50 dBA Leq-h between 7 A.M. and 9:59 P.M. and 45 dBA from 10 P.M. to 6:59 A.M at the property lines. When two joint boundaries differ in zoning the City of Oceanside Noise Ordinance utilizes the arithmetic mean of the two standards. Therefore, the Project must meet the most restrictive daytime and evening standards of 52.5 dBA and 47.5 dBA at the residential property lines per the City of Oceanside Municipal Code.

Rooftop mechanical ventilation units (HVAC) will be installed on the proposed buildings. In order to evaluate the HVAC noise impacts, the analysis utilized reference noise level measurements taken at a Project site in Murrieta, CA in 2010. The unshielded noise levels for the HVAC units were measured at 65.9 dBA Leq at a distance of 6-feet.

To predict the worst-case future noise environment, a continuous reference noise level of 65.9 dBA at 6-feet was used to represent the roof-top mechanical ventilation system for each unit. Even though the mechanical ventilation system will cycle on and off throughout the day, this approach presents the worst-case noise condition. In addition, these units are designed to provide cooling during the peak summer daytime periods, and it is unlikely that all the units will be operating continuously.

The noise level reductions due to distance for the nearest residential uses located to the south is provided in Table 6-1 below. The proposed HVAC operational noise levels are in compliance with the City's daytime 52.5 dBA property line standard and would also meet the most restrictive nighttime standard of 47.5 dBA. No impacts are anticipated and no further mitigation is required. Additionally, most of the HVAC units will be located farther from the residential property line as part of the proposed project.

Table 6-1: Project HVAC Noise Levels (Southern Property Line)

Source	Distance to Observer Location (Feet)	Hourly Reference Noise Level (dBA)	Noise Source Reference Distance (Feet)	Noise Reduction Due to Distance (dBA)	Noise Level at Property Line (dBA)	Quantity	Property Line Cumulative Noise Level (dBA)*
HVAC	370	65.9	6.0	-35.6	-35.8	16	42.1
HVAC	375	65.9	6.0	-35.7	-35.9	14	41.4
HVAC	395	65.9	6.0	-36.1	-36.4	12	40.3
HVAC	410	65.9	6.0	-36.5	-36.7	12	40.0
Cumulative Noise Level @ Property Line (dBA)							**47.1**
*Complies with the nighttime Noise Standard of 47.5 dBA.							

<u>Deliveries and Trash</u>

The proposed project is not anticipated to require a significant number of truck deliveries or garbage trucks. The deliveries for the proposed project would consist mostly of smaller deliveries in smaller trucks and a few larger trucks that would be infrequent. In any given hour, it is anticipated that at most two deliveries would occur. The noise associated with one large truck delivery and smaller truck would not result in a significant number of truck trips to significantly increase noise within the project area.

In order to evaluate the truck delivery noise impacts, the analysis utilized reference noise level measurements taken at a Shopping Center. The measurements include truck drive-by noise, truck loading/unloading and truck engine noise. The unmitigated exterior noise levels for truck drive-by noise and truck engine noise were measured at 66.5 dBA Leq at a distance of 25-feet from the loading dock. A truck will take approximately 2 minutes to drive in the site and position itself, less than 30 minutes to be unloaded and another 2 minutes to exit the site. During the loading/unloading of the truck the engine can only idle for five (5) minutes in compliance with State air quality requirements. To be conservative, it was assumed the truck engine could be operating for 15 minutes of the total time required during the delivery process (5 minutes at arrival, 5 minutes of idle and 5 minutes at departure).

All deliveries to the project site would occur during the daytime hours and the trucks will be in the center of the site and the nearest sensitive receptors to the project site include the single-family residences to the south over 350 feet from the trucks. Therefore, based on the limited operational time of a delivery truck while on-site and distance separation no noise impacts are anticipated.

Parking Lots

Traffic associated with parking lots is typically not of sufficient volume to exceed community noise standards, which are based on a time-averaged scale. However, the instantaneous sound levels generated by a car door slamming and engine starting up may be an annoyance to adjacent sensitive receptors. The estimated maximum noise levels associated with parking lot activities typically range from 60-65 dBA and are short term. It should be noted that parking lot noise are instantaneous noise levels compared to noise standards, which are averaged over time. As a result, actual noise levels over time resulting from parking lot activities would be far lower. Therefore, based on the limited operational time of vehicles on-site and the distance separation no noise impacts are anticipated.