Appendix M
Noise Assessment

NOISE ASSESSMENT

Carlton Oaks Country Club and Resort
City of Santee, CA

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Project: 24-49 Carlton Oaks 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.

1.0 INTRODUCTION

1.1 Purpose of this Study

Carlton Oaks Golf Course ownership and Lennar Homes, as joint project proponents, are proposing to redevelop the existing Carlton Oaks Country Club Resort (COCCR) into a modern self-sustaining destination resort with an added residential accessory use on roughly 100.6 acres in the City of Santee and 64.6 acres in the City of San Diego, for a total of roughly 165 acres ("project site"). The project components include redoing the existing golf course and demolishing the existing resort facilities and then re-constructing the redesigned resort. Approximately 3.5 acres consist of areas outside of the project site that would will be developed with improvements associated with the project and are located either in the City of San Diego or City of Santee (offsite improvement areas). The offsite improvement areas and the proposed project site make up the CEQA Study Area of a total of approximately 169 acres.

Work proposed on the portion of the project located within the City of San Diego primarily consists of redoing the existing golf course. All work on the proposed resort, including demolishing the existing facilities and construction of the residential accessory units, will occur within the City of Santee's jurisdiction. Consequently, the City of Santee is the public agency that has the principal responsibility for carrying out and approving the Project and is the lead agency for purposes of California Environmental Quality Act (CEQA).

The purpose of this Noise study is to determine potential noise impacts (if any) created from the proposed construction operations and to determine potential noise impacts (if any) to the site 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 proposed project is situated north of State Route 52 (SR-52), where it traverses in an east–west direction, south of single-family and multifamily residential development lining Carlton Oaks Drive, east of West Hills Parkway and SR-52, and in a northwest–southeast direction, and east of the open space associated with the San Diego River Trail and a residential development. A project vicinity map is shown in Figure 1-A.

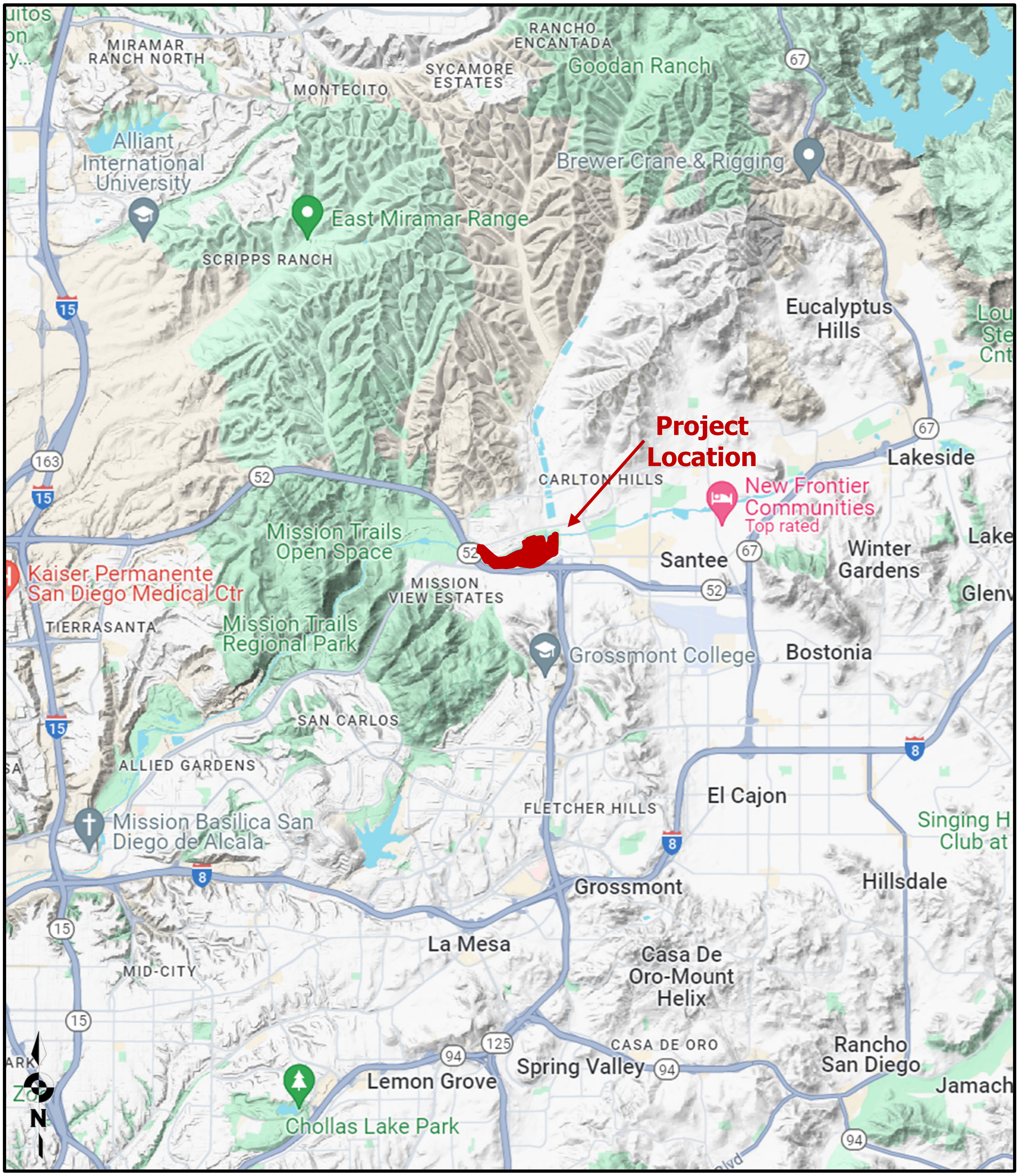
1.3 Project Description

The existing COCCR consists of a 145-acre 18-hole golf course, clubhouse, pool, restaurant, and golf amenities such as a pro-shop and driving range as well as multiple sheds and a maintenance building. In addition, the existing development has a 43-unit hotel and 9 single story casitas which look like residential units. Combined the hotel and casitas operate as a 52-unit hotel. The existing hardscape is approximately 106,000 square feet making up the onsite parking and roadways. The existing golf course has roots dating back to the 1950's and was last renovated in 1989.

The proposed project would demolish all existing facilities onsite and reconstruct them using the latest energy efficient construction techniques. The project would construct a new reduced size 104-acre golf course and golf amenities, clubhouse, pool, restaurant, and a new energy efficient 52-unit hotel. The Project would include parking with 292 parking spaces. In addition, the project would construct 236 multi-family residential units and six (6) single-family residential units. No amendments to zoning designations are needed to accommodate the project.

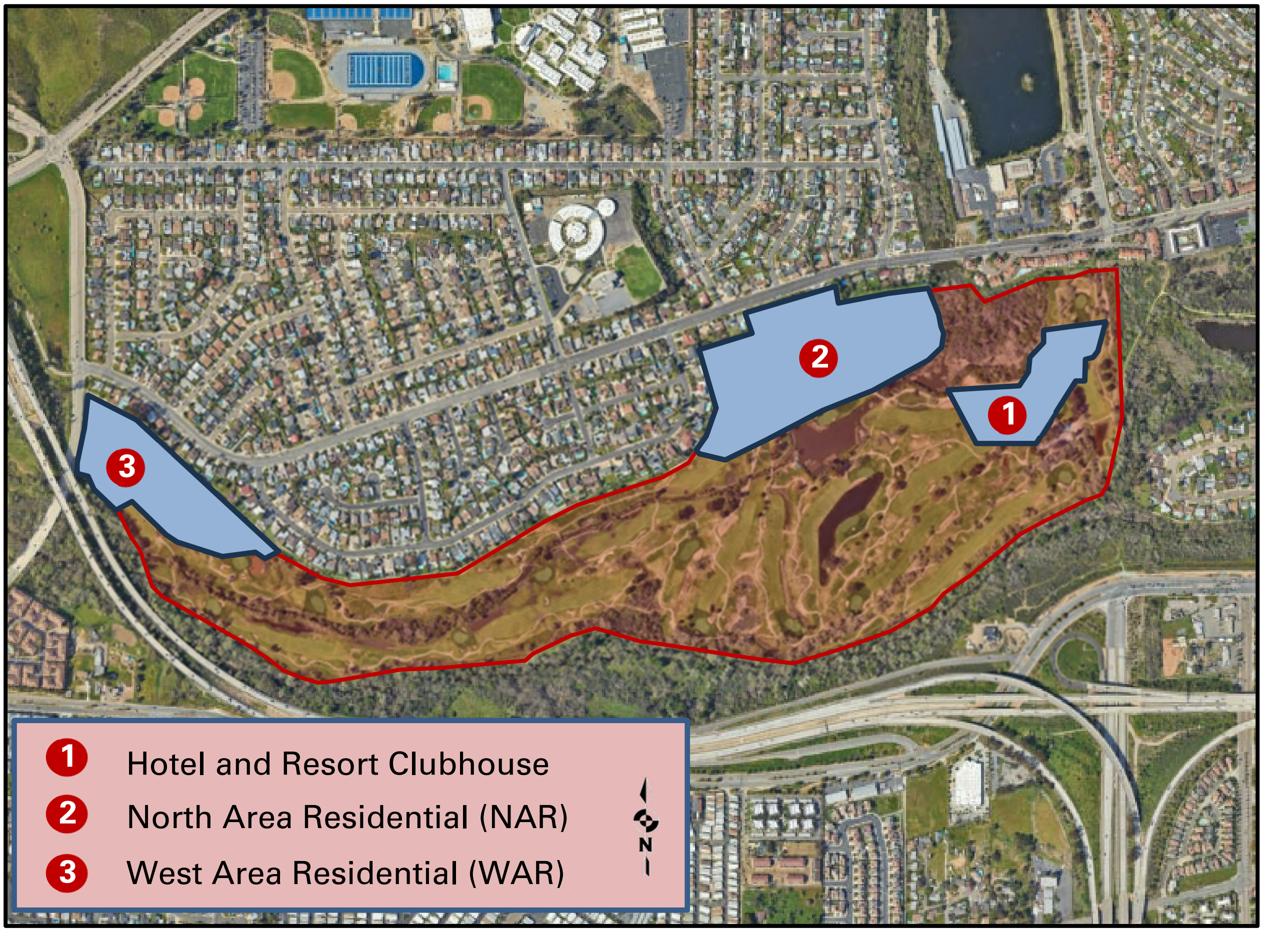
Construction is expected to span approximately 5 years, beginning in 2024 and ending in late 2028. The proposed Project development plan is provided in a Project Development below in Figure 1-B and is followed by a figure of each development area to include the Hotel and Clubhouse area, North Area Residential (NAR), West Area Residential (WAR) (See Figures 1-C through -E).

Figure 1-A: Project Vicinity Map



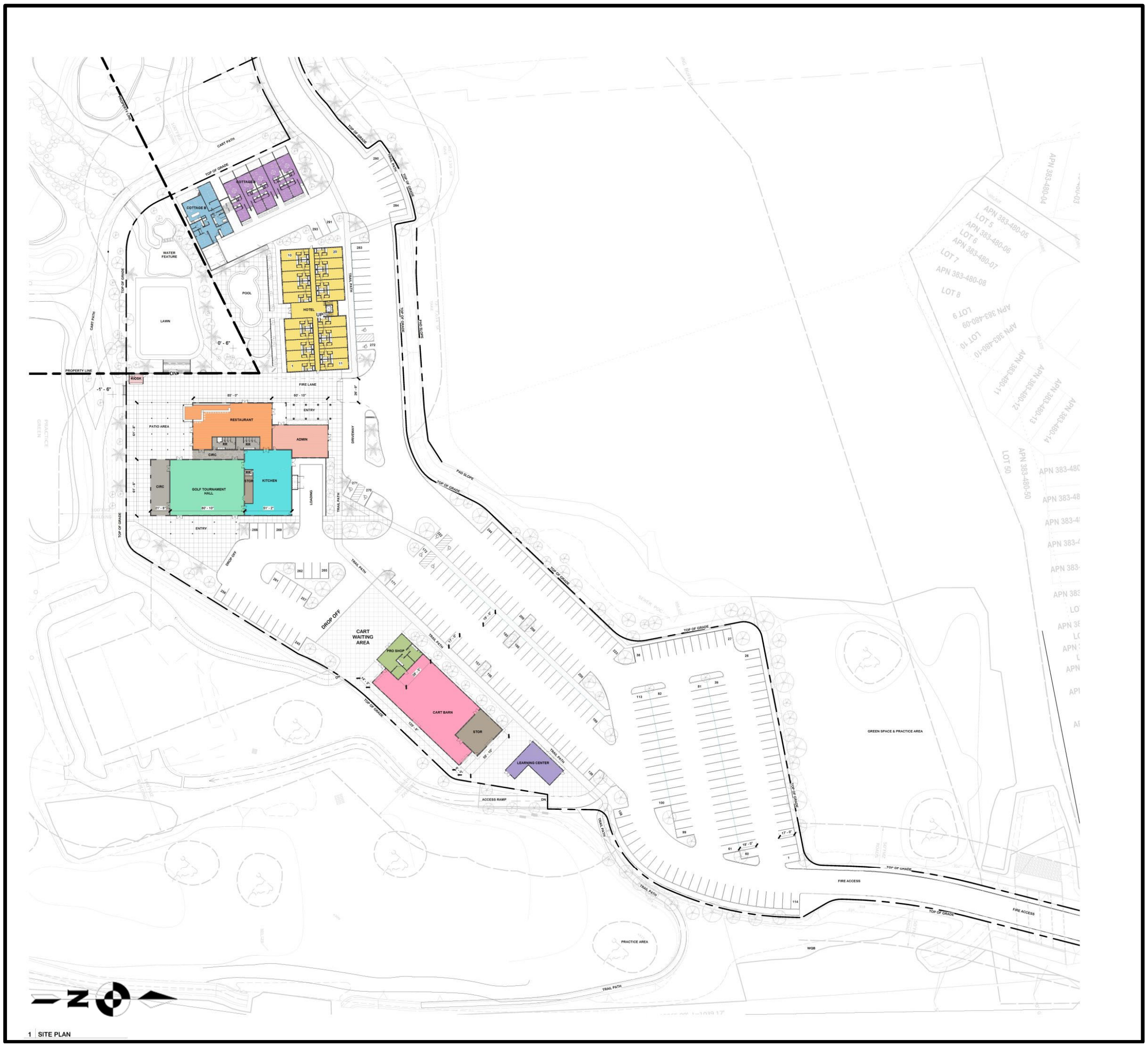
Source: (Google, 2024)

Figure 1-B: Project Development Map



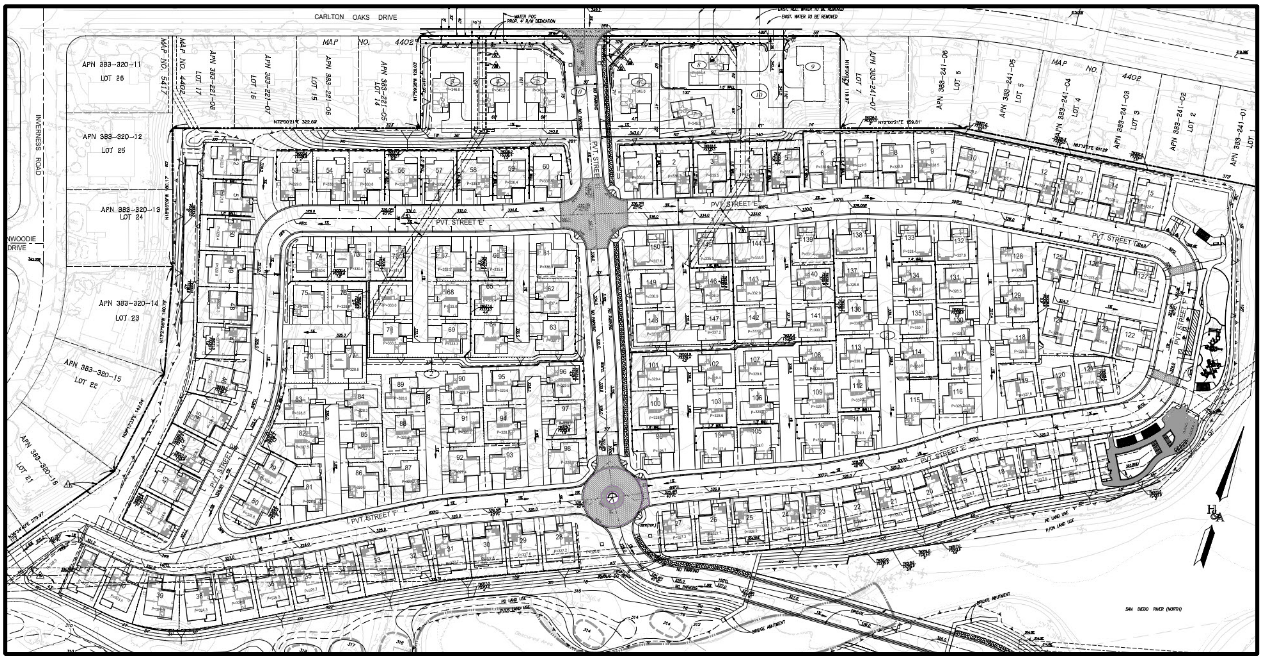
Source: (Google Earth Pro, 2024)

Figure 1-C: Hotel and Resort Clubhouse Development Details



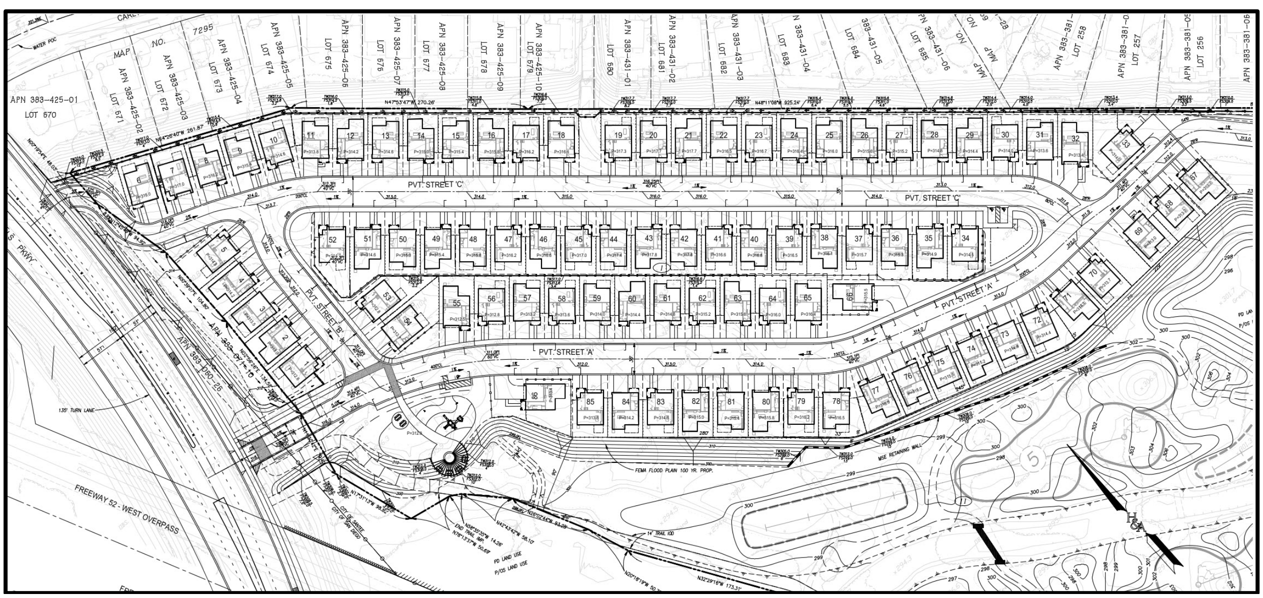
Source: (Atelier5 Design, 2024)

Figure 1-D: NAR Development Details



Source: (Hunsaker & Associates , 2025)

Figure 1-E: WAR Development Details



Source: (Hunsaker & Associates , 2025)

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 Day-Night Average Sound Level (Ldn) is the 24 hour A-weighted average for sound, with corrections for nighttime hours. The corrections require 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 nighttime hours when sound appears louder. Ldn values do not represent the actual sound level heard at any particular time, but rather represents the total sound exposure.

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 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 occurring 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, 2020 (Caltrans, 2020).		

3.0 SIGNIFICANCE THRESHOLDS AND STANDARDS

3.1 Construction Noise

Construction noise is controlled by Santee Municipal Code Section 5.04.090 (Construction Equipment), which states the following.

Except for emergency work or work that has been expressly approved by the City, it is unlawful for any person to operate any single or combination of powered construction equipment at any construction site, as follows:

1. It is unlawful for any person to operate any single or combination of powered construction equipment at any construction site on Mondays through Saturdays except between the hours of 7:00 a.m. and 7:00 p.m., unless expressly approved by the Director of Development Services.
2. It is unlawful for any person to operate any single or combination of powered construction equipment at any construction site on Sundays or City recognized holidays unless expressly approved by the Director of Development Services.
3. No construction equipment is permitted to be started, idled, moved or operated at any location before 7:00 a.m. or after 7:00 p.m. on Mondays through Saturdays and all times on Sundays and holidays, described in subsection (A)(2) of this section. Specific exemptions may be authorized by the Director of Development Services.
4. Construction equipment with a manufacturer's noise rating of 85 dBA Lmax or greater, may only operate at a specific location for 10 consecutive workdays. If work involving such equipment will involve more than 10 consecutive workdays, a notice must be provided to all property owners and residents within 300 feet of the site no later than 10 days before the start of construction. The notice must be approved by the City and describe the project, the expected duration, and provide a point of contact to resolve noise complaints."

Because the City of Santee does not have property line standards for construction, the County of San Diego 75 dBA Leq standard is utilized in the analysis. Section 36.408 and 36.409 of the County 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 an 8–hour period from 7:00 a.m. to 7:00 p.m.

3.2 Vibration Standards

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.

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 and any blasting operations will be conditioned to comply with the thresholds stated above. The potential noise and vibration impacts are analyzed separately below.

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,* 2018 (FTA, 2018).

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.

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,* 2018 (FTA, 2018). Notes: RMS velocity calculated from vibration level (VdB) using the reference of one microinch/second.		

3.3 Transportation Noise Standards

The City of Santee's General Plan Noise Element uses the Land Use Compatibility for Community Noise Exposure listed in Figure 7-3 (Figure 3-A of this report) to determine the compatibility of land use when evaluating proposed development projects. For noise sensitive single and multifamily residential land uses, the City has adopted a policy which has established a "normally acceptable" exterior noise level goal of 65 dBA Ldn for the outdoor areas and an interior noise level of less than 45 dBA Ldn for residential land uses. For residential properties identified as requiring a noise study, a study shall be prepared by an acoustical professional. This study shall document the projected maximum exterior noise level and mitigate the projected exterior noise level to a maximum allowable noise level as identified in the City's General Plan.

Additionally, the Noise Element identifies transportation noise policies designed to protect, create, and maintain an environment free of harmful noise that could impact the health and welfare of sensitive receptors. The following City of Santee General Plan goals, policies, and actions for addressing noise are applicable to the Project:

Objective 1.0: Control noise from sources adjacent to residential, institutional and other noise-sensitive receptors.

Policy 1.1 The City shall support a coordinated program to protect and improve the acoustical environment of the City including development review for new public and private development and code compliance for existing development.

Policy 1.2 The City shall utilize noise studies and noise contour maps when evaluating development proposals during the discretionary review process.

Objective 2.0: Ensure that future developments will be constructed to minimize interior and exterior noise levels.

Policy 2.1 The City shall adhere to planning guidelines and building codes which include noise control for the exterior and interior living space of all new residential developments within noise impacted areas.

Policy 2.2 The City should require new development to mitigate noise impacts to existing uses resulting from new development when: 1) such development adds traffic to existing City streets that necessitates the widening of the street; and 2) the additional traffic generated by the new development causes the noise standard or significance thresholds to be exceeded.

Policy 2.3 The City should not require new development to mitigate noise impacts to existing uses when the new development only adds traffic already anticipated by the City's General Plan to an existing street, but does not necessitate widening of that street.

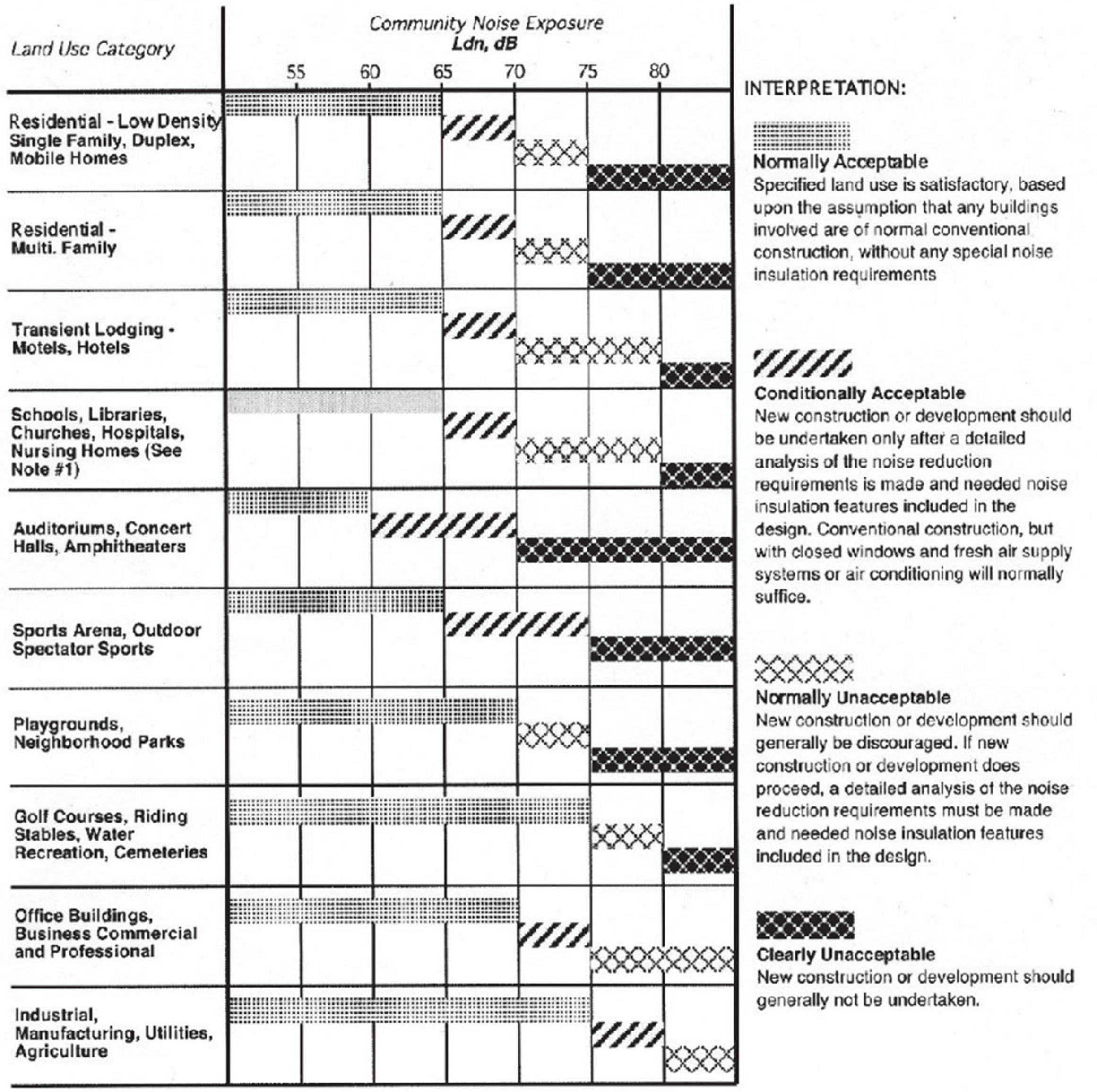
3.4 Operational Noise Standards

Impacts to sensitive receptors generated by activities at a given location are regulated by the City's Municipal Code (Section 5.04.040). The municipal code states that "it is unlawful for any person to operate or allow the operation of any generator, air conditioning, refrigeration, or heating equipment in such manner as to create a noise disturbance on the premises of any other occupied property, or if a condominium, apartment house, duplex, or attached business, within any adjoining unit". The municipal code does not specify numerical sound level limits for operational noise, therefore, in accordance with the Noise Element of the General Plan, the noise level threshold is 65 dBA Leq at the residential property lines.

Because the project includes a sewer-lift station with an emergency generator, City standards related to emergency work are also relevant. The City defines emergency work as: "work made necessary to restore property to a safe condition following a public calamity or work required to protect persons or property from imminent exposure to danger or damage or work by public or private utilities when restoring utility service." As such, an emergency generator supporting a sewage system would qualify as emergency work, which is exempted from the noise standards under the following conditions.

1. The Noise Control Officer has been notified in advance, if possible, or as soon as practical after the emergency; and
2. Any motor vehicle, apparatus, or equipment used, related to or connected with emergency work is designed, modified or equipped to reduce sounds produced to the lowest possible level consistent with effective operation of such vehicle, device, apparatus, or equipment.

Figure 3-A: Noise / Land Use Compatibility Guide



Notes:

1. Applies to noise sensitive areas which serve a significant function for the use which could be adversely affected by noise; such as, outside areas used primarily for instruction, meditation areas, rest and relaxation areas, and other areas where general peace and quiet are important.

4.0 CONSTRUCTION NOISE

4.1 Construction Noise Prediction Methodology

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 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.

4.2 Construction Noise Findings

The Project is expected to break ground early 2024 and be completed by the fourth quarter 2028. Construction activities will take place between the hours of 7:00 a.m. and 7:00 p.m. Monday through Saturday, except for City recognized holidays unless expressly approved by the City of Santee’s Director of Development Services, in accordance with the City’s Noise Ordinance.

The development construction of West Area Residential and North Area Residential will consist of demolition, grading, wet and dry utilities, building construction, and architectural coating. The development construction of the hotel and golf course will consist of grading excavation, grading, finish grading, clubhouse construction, clubhouse paving, clubhouse architectural coating, hotel construction, hotel paving, and hotel architectural coating. Additionally, overall project construction would consist of import and paving.

The nearest residences to be impacted by construction of West Area Residential and North Area Residential are the single-family homes located adjacent to the project to the north along Carlton Oaks Drive and Inverness Road. The nearest residences to be impacted by construction of the hotel and golf course are the single-family homes located to the east.

Using a point-source noise prediction model, calculations of the expected construction noise impacts were completed. The essential model input data for these performance equations include the source levels of each type of equipment, relative 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. A summary of the construction phases and a list of the anticipated noise levels for each phase of construction is shown in Tables 4-1 through 4-4.

As can be seen in the tables, construction noise levels will comply with the 75 dBA Leq standard 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.

Table 4-1: Construction Phases and Noise Levels

Equipment Required	Source Level @ 50' (dBA)	Quantity	Phase Noise Level @ 50' (dBA)	Distance to Nearest Receptor (Feet)	Noise Level at Nearest Receptor (dBA)
Project Import					
Crawler Tractors	74	1	75	100	69.0
Project Paving					
Pavers	74	2	81.5	160	71.4
Paving Equipment	74	2			
Rollers	73	2			

Table 4-2: Construction Phases and Noise Levels (NAR)

Equipment Required	Source Level @ 50' (dBA)	Quantity	Phase Noise Level @ 50' (dBA)	Distance to Nearest Receptor (Feet)	Noise Level at Nearest Receptor (dBA)
Demolition					
Concrete/Industrial Saws	83	1	85.1	160	75.0
Excavators	77	1			
Crawler Tractors	75	1			
Grading					
Graders	81	1	84.8	340	68.1
Rubber Tired Dozers	78	1			
Scrapers	80	2			
Crawler Tractors	75	2			
Wet Utilities					
Excavators	77	2	84.6	160	74.5
Tractors/Loaders/Backhoes	75	2			
Rubber Tired Loaders	78	2			
Dry Utilities					
Skid Steer Loaders	74	1	78.8	160	68.7
Rollers	73	1			
Tractors/Loaders/Backhoes	75	1			
Building Construction					
Forklifts	75	2	82.3	320	66.1
Tractors/Loaders/Backhoes	75	2			
Welders	70	1			
Rough Terrain Forklifts	75	1			
Architectural Coating					
Air Compressors (Electric)	74	1	74.0	320	57.6

Table 4-3: Construction Phases and Noise Levels (WAR)

Equipment Required	Source Level @ 50' (dBA)	Quantity	Phase Noise Level @ 50' (dBA)	Distance to Nearest Receptor (Feet)	Noise Level at Nearest Receptor (dBA)
Grading					
Graders	81	1	86.6	190	75.0
Rubber Tired Dozers	78	1			
Scrapers	80	2			
Crawler Tractors	75	2			
Wet Utilities					
Excavators	77	2	83.6	210	71.1
Tractors/Loaders/Backhoes	75	2			
Rubber Tired Loaders	75	2			
Dry Utilities					
Skid Steer Loaders	74	1	78.8	210	66.4
Rollers	73	1			
Tractors/Loaders/Backhoes	75	1			
Building Construction					
Forklifts	75	2	82.3	190	70.7
Tractors/Loaders/Backhoes	75	2			
Welders	70	1			
Rough Terrain Forklifts	75	1			
Architectural Coating					
Air Compressors (Electric)	74	1	74.0	190	62.4

Table 4-4: Construction Phases and Noise Levels (Hotel/Golf Course)

Equipment Required	Source Level @ 50′ (dBA)	Quantity	Phase Noise Level @ 50′ (dBA)	Distance to Nearest Receptor (Feet)	Noise Level at Nearest Receptor (dBA)
Grading Excavation					
Rubber Tired Dozers	78	1	84.4	760	60.8
Graders	81	1			
Scrapers	80	1			
Crawler Tractors	75	1			
Grading					
Graders	81	1	86.2	760	62.5
Rubber Tired Dozers	78	1			
Scrapers	80	2			
Crawler Tractors	75	2			
Finish					
Graders	81	1	83.8	760	60.2
Crawler Tractors	75	1			
Scrapers	80	1			
Clubhouse Construction					
Cranes	73	1	81.4	670	58.9
Forklifts	75	1			
Tractors/Loaders/Backhoes	75	2			
Welders	70	1			
Rough Terrain Forklifts	75	1			
Clubhouse Architectural Coating					
Air Compressors (Electric)	74	1	73.7	670	51.2
Hotel Construction					
Cranes	73	1	81.4	1100	54.6
Forklifts	75	1			
Tractors/Loaders/Backhoes	75	2			
Welders	70	1			
Rough Terrain Forklifts	75	1			
Hotel Architectural Coating					
Air Compressors (Electric)	74	1	73.7	1100	46.9

4.3 Off-Site Construction Traffic Noise Impacts

The construction activities will require as much as 279,020 Cubic Yards (CY) of soil import which will require as many as 111 daily round truck trips traveling roughly 4 miles in each direction to and from Sycamore Landfill. The noise levels and the distances to the 60 dBA CNEL contours for the roadways along the truck route are given in Table 4-5 for the Existing year traffic and the Existing plus Construction Traffic Scenario is provided in Table 4-6. 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 4-7 presents a comparison of the Existing Year with and without Project construction related traffic noise levels. The roadway segment noise levels could increase 0.1 dBA Ldn with the construction trips of the proposed project. The project does not create a direct noise level increase of more than 3 dBA CNEL on any roadway segments as shown in Table 4-7. Therefore, the proposed Project's contributions to off-site roadway noise increases from construction traffic will not cause any significant impacts to any existing or future noise sensitive land uses.

Table 4-5: Existing Traffic Noise Levels

Roadway	Roadway Segment	ADT[1]	Vehicle Speeds (MPH)[1]	Noise Level @ 50-Feet (dBA Ldn)	60 dBA CNEL Contour Distance (Feet)
West Hills Parkway	Mast Blvd to Carlton Oaks Dr	12,878	45	68.0	286
Carlton Oaks Drive	West Hills Pkwy to Wethersfield Rd	5,510	35	61.8	73
	Wethersfield Rd to Burning Tree Wy	6,350	35	62.4	85
	Burning Tree Wy to Pebble Beach Dr	8,760	35	63.8	117
	Pebble Beach Dr to Fanita Pkwy	8,760	35	63.8	117
[1] Source: Project Traffic study (Intersecting Metrics, 2024)					

Table 4-6: Existing + Construction Traffic Noise Levels

Roadway	Roadway Segment	ADT[1]	Vehicle Speeds (MPH)[1]	Noise Level @ 50-Feet (dBA Ldn)	60 dBA Ldn Contour Distance (Feet)
West Hills Pkwy	Mast Blvd to Carlton Oaks Dr	12,989	45	68.1	323
Carlton Oaks Drive	West Hills Pkwy to Wethersfield Rd	5,621	35	61.9	77
	Wethersfield Rd to Burning Tree Wy	6,461	35	62.5	89
	Burning Tree Wy to Pebble Beach Dr	8,871	35	64.9	155
	Pebble Beach Dr to Fanita Pkwy	8,871	35	64.9	155
[1] Source: Project Traffic study (Intersecting Metrics, 2024)					

Table 4-7: Existing vs. Existing + Construction Traffic Noise Levels

Roadway	Roadway Segment	Existing Noise Level (dBA Ldn)	Existing Plus Construction Traffic Noise Level (dBA Ldn)	Construction Traffic Related Noise Level Increase (dBA Ldn)
West Hills Pkwy	Mast Blvd to Carlton Oaks Dr	68.0	68.1	0.1
Carlton Oaks Drive	West Hills Pkwy to Wethersfield Rd	61.8	61.9	0.1
	Wethersfield Rd to Burning Tree Wy	62.4	62.5	0.1
	Burning Tree Wy to Pebble Beach Dr	63.8	64.9	0.1
	Pebble Beach Dr to Fanita Pkwy	63.8	64.9	0.1

4.4 Construction Vibration Findings and Mitigation

As previously mentioned, the nearest residences to be impacted by construction of West Area Residential and North Area Residential are the single-family homes located adjacent to the project to the north along Carlton Oaks Drive and Inverness Road. Based on aerial photography and the existing topo maps, a majority of the homes are set back from the property lines by 30 to 50 feet. However, the worst-case residence is located along Inverness Road with an existing structure as close as 18 feet from the property line.

Because vibration impacts are assessed based on the PPV, the worst-case (i.e., closest) distance between each source (i.e., construction equipment) and receptor (i.e., home) should be used in the analysis, rather than an average distance. Due to the constraints of the equipment, larger equipment would not be working adjacent to the property lines. However, smaller equipment could potentially work adjacent to the property lines. Table 4-8 lists the resultant vibration levels based on the distances to the that would be experienced at the nearest vibration sensitive land uses (i.e. the existing residential structures) from the temporary construction activities.

Although, no vibratory compaction is anticipated per the grading contractor. However, as a precaution, a mitigation measure has been included. During all construction activity at the project site, the project proponent will require its construction contractor(s) to observe the following buffer distances to reduce groundborne vibration at nearby offsite buildings per FTA thresholds:

- Avoid vibratory compaction within 100 feet of residential buildings.

If the listed buffer distance cannot be maintained, alternative equipment can be used that avoids or reduces high vibrational levels at the source. Non-vibratory rollers may be used in place of vibratory rollers.

Table 4-8: Vibration Levels from Construction Activities (Residential Receptors)

Equipment	Approximate Velocity Level at 25 Feet (VdB)	Approximate RMS Velocity at 25 Feet (in/sec)	Distance to Sensitive Use (Feet)	Resultant Velocity Level (VdB)	Resultant RMS Velocity (in/sec)
Small bulldozer	58	0.003	30	55.6	0.002
Loaded trucks	86	0.076	50	77.0	0.027
Large bulldozer	87	0.089	50	78.0	0.031
Vibratory Roller	94	0.210	100	75.9	0.026
			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 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.

5.0 TRANSPORTATION NOISE

5.1 Existing Noise Environment Onsite

Long-term 72-hour measurements were taken at the Project's property lines having a relatively flat terrain and no obstruction from trees or structures. The noise measurements were recorded on Wednesday January 22nd to Saturday January 25th, 2025 by Ldn Consulting between approximately 1:00 p.m. and 1:00 p.m. three days later. Noise measurements were taken using 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 meters and microphones were mounted on a tripod, five feet above the ground and equipped with a windscreen during all measurements. The sound level meters were calibrated before and after the monitoring using a Larson-Davis calibrator, Model CAL 200. Table 5-1 provides the hourly noise levels along with the average and Ldn values. The noise measurement locations were determined based on-site access and noise impact potential to the proposed sensitive uses. The noise monitoring locations are provided graphically in Figure 5-A.

Table 5-1: Long-Term Noise Level Summary

Location	Description	72-Hour Noise Level (Leq)	72-Hour Noise Level (Ldn)
LT-1	Southern tree line near the western end of the golf course	61.4	66.3
LT-2	Northern edge of the golf course, near 8359 Carlton Oaks Drive	54.9	61.6
LT-3	Southern tree line near the approximate center of the golf course	52.9	60.0
LT-4	Near the golf course maintenance building, east of 9235 Inverness Road	55.5	62.5
LT-5	Northeastern corner of golf course, south of 9047 Calle del Verde	50.6	56.1
LT-6	Near tree line at the southeastern corner of the golf course, west of 8938 Willowgrove Avenue	52.5	58.6

Figure 5-A: Ambient Monitoring Locations

Source: (Google Earth Pro, 2024)

5.2 Future Onsite Roadway Noise

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 automobiles, medium trucks and heavy trucks for input into the FHWA Model. The Buildout conditions include the Horizon Year 2035 with Project Traffic Conditions provided in the project traffic study as shown in Table 5-2 (*Source: Carlton Oaks Country Club and Resort Local Transportation Analysis,* (Intersecting Metrics, 2024)).

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
SR-52	129,320	12,932	65	96	2	2
W Hills Parkway	18,350	1,835	45	96	2	2

[1] Source: (Intersecting Metrics, 2024)
[2] Typical Vehicle Mix observed in the City of Santee

The FHWA Model spreadsheet calculation was used which computes equivalent noise levels for each of the time periods used in the calculation of Ldn. Weighting these equivalent noise levels and summing them gives the Ldn for the traffic projections.

The results of the specific noise modeling are provided in Figure 5-B for the West Area Residential. According to the analysis, the model is overestimating the noise levels at the West Area Residential by approximately 11 dBA above the measured noise levels determined in Section 5.1 above. This is due to SR-52 being elevated above the site as well as barriers along the roadways. To verify the reduction provided by the existing topography, the Fresnel Barrier Reduction Calculations based on distance, source height, receiver elevation and the top of barrier were modeled. It was confirmed that the existing topography is providing an approximate 11 dBA noise reduction from SR-52.

Additionally, the Fresnel Barrier Calculations were used to determine the barrier requirements for W Hills Parkway since noise levels are above the 65 dBA Ldn threshold. It was determined that a minimum 6-foot barrier would reduce the noise levels by 5 dBA. As seen in Figure 5-B, with the existing topography along SR-52 and the proposed 6-foot barrier along W Hills Parkway, noise levels at the proposed West Area Residential would meet the City's 65 dBA Ldn noise threshold. The Fresnel barrier reduction calculations for the building are provided in ***Attachment A*** of this report.

Figure 5-B: Future Exterior Noise Levels - WAR

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**	**Ldn @ 50 Feet**	**60 Ldn (Feet)**
SR-52	129,320	65	84.2	2,039
West Hills Parkway	18,350	45	71.9	309

Noise Reduction due to Distance

	Distance	**Reduction from Distance**	**Reduction from Barriers**	**Resultant Level**
SR-52	234	-10.05	-10.8	63.3
West Hills Parkway	120	-5.70	-4.9	61.3
Cumulative Noise Level			**65.4**	**dBA Ldn**

The results of the specific noise modeling are provided in Figure 5-C for the North Area Residential. It was determined that the noise levels at the proposed rear yards along Carlton Oaks Drive would exceed the City's 65 dBA Ldn threshold. To determine the required mitigation, the Fresnel Barrier Calculations were used to determine the barrier requirements. It was determined that a minimum 6-foot barrier would reduce the noise levels by 5 dBA. As seen in Figure 5-C, with the proposed 6-foot barrier along Carlton Oaks Drive, noise levels at the proposed North Area Residential would meet the City's 65 dBA Ldn noise threshold. The Fresnel barrier reduction calculations for the building are provided in ***Attachment A*** of this report.

Figure 5-C: Future Exterior Noise Levels - NAR

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**	**Ldn @ 50 Feet**	**60 Ldn (Feet)**
SR-52	129,320	65	84.2	2,039
Carlton Oaks Drive	9,884	45	69.2	205

Noise Reduction due to Distance				
	Distance	**Reduction from Distance**	**Reduction from Barriers**	**Resultant Level**
SR-52	2,570	-25.66	-10.8	47.7
Carlton Oaks Drive	60	-0.79	-5.1	63.3
Cumulative Noise Level			**63.4**	**dBA Ldn**

The sensitive use areas associated with the Resort are located over 1,000 feet from any local area roadways. Therefore, the noise levels at the Resort would be well below the City's 65 dBA threshold and no additional mitigation is required. The required mitigation location and heights is shown in Figure 5-D for the West Area Residential and in Figure 5-E for the North Area Residential to reduce noise levels below the City's 65 dBA Ldn noise threshold. The barriers must be constructed of a non-gapping material consisting of masonry, ½ inch thick glass, earthen berm or any combination of these materials.

Figure 5-D: Exterior Noise Mitigation Measures - WAR

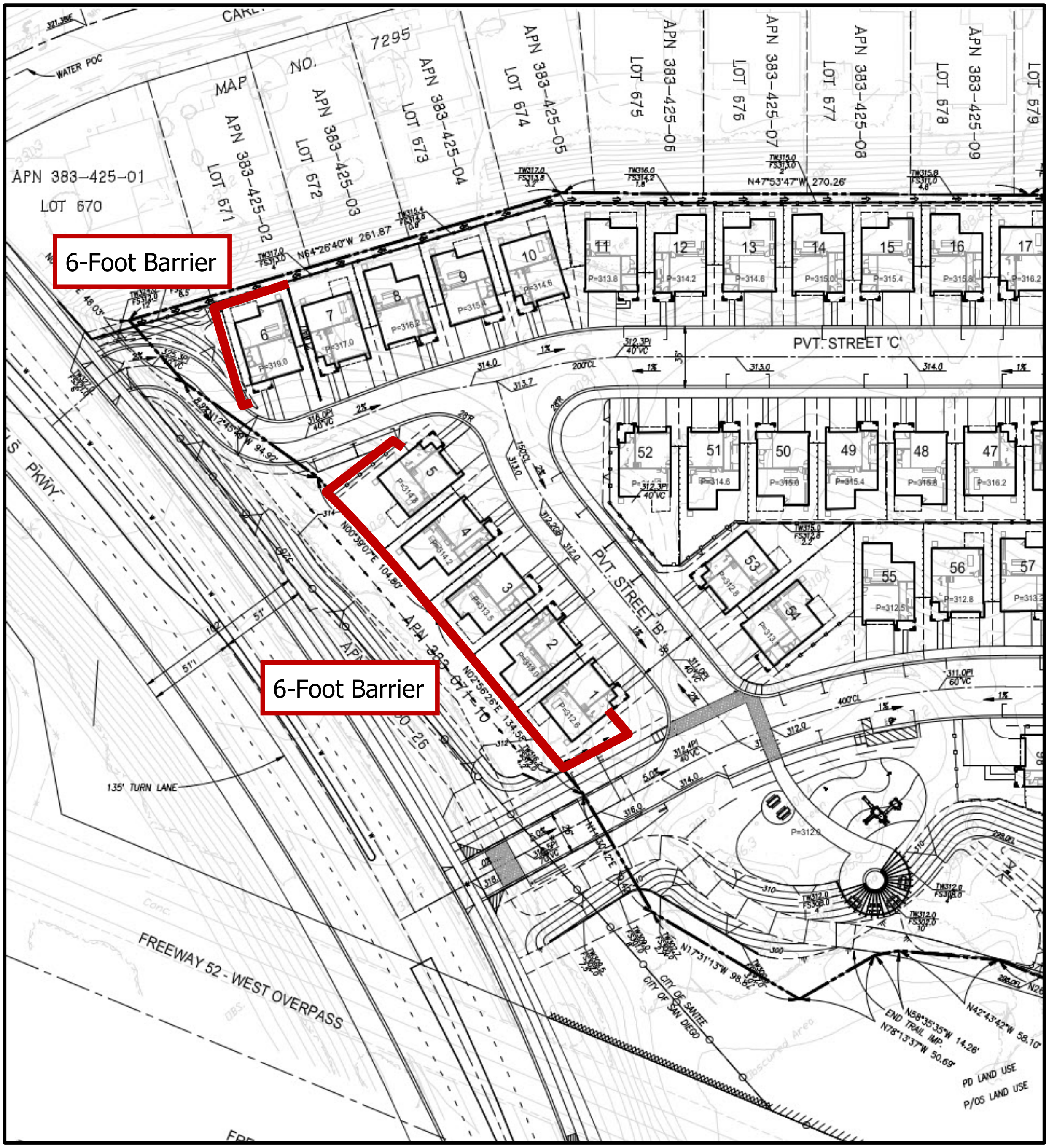


Figure 5-E: Exterior Noise Mitigation Measures – NAR

5.3 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 Ldn. Weighting these equivalent noise levels and summing them gives the Ldn 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 Ldn 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.

Direct Noise Impacts

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: Intersecting Metrics 2024) 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 Ldn contours for the roadways in the vicinity of the Project site are given in Table 5-3 for the Existing Scenario and in Table 5-4 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 5-5 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 1.1 dBA Ldn with the development of the Project. The Project does not create a direct noise increase of more than 3 dBA Ldn 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 5-3: Existing Noise Levels

Roadway	Roadway Segment	ADT[1]	Vehicle Speeds (MPH)[1]	Noise Level @ 50-Feet (dBA Ldn)	60 dBA CNEL Contour Distance (Feet)
West Hills Parkway	Mast Blvd to Carlton Oaks Dr	12,878	45	68.0	286
	Carlton Oaks Dr to Mission Gorge Rd	10,966	45	67.4	249
Mast Boulevard	SR-52 EB Ramps to SR-52 WB Ramps	13,483	40	66.7	222
	SR-52 WB Ramps to West Hills Pkwy	29,664	40	70.2	431
Carlton Oaks Drive	West Hills Pkwy to Wethersfield Rd	5,510	35	61.8	73
	Wethersfield Rd to Burning Tree Wy	6,350	35	62.4	85
	Burning Tree Wy to Pebble Beach Dr	8,760	35	63.8	117
	Pebble Beach Dr to Fanita Pkwy	8,760	35	63.8	117
	Fanita Pkwy to Carlton Hills Blvd	10,240	35	64.5	136
Carlton Hills Boulevard	Mast Blvd to Carlton Oaks Dr	10,548	35	64.1	126
	Carlton Oaks Dr to Mission Gorge Rd	24,042	35	67.6	268
[1] Source: Project Traffic study prepared by Intersecting Metrics 2024					

Table 5-4: Existing + Project Noise Levels

Roadway	Roadway Segment	ADT[1]	Vehicle Speeds (MPH)[1]	Noise Level @ 50-Feet (dBA Ldn)	60 dBA Ldn Contour Distance (Feet)
West Hills Parkway	Mast Blvd to Carlton Oaks Dr	13,627	45	68.3	300
	Carlton Oaks Dr to Mission Gorge Rd	11,888	45	67.7	267
Mast Boulevard	SR-52 EB Ramps to SR-52 WB Ramps	13,858	40	66.9	227
	SR-52 WB Ramps to West Hills Pkwy	30,413	40	70.3	440
Carlton Oaks Drive	West Hills Pkwy to Wethersfield Rd	7,181	35	62.9	95
	Wethersfield Rd to Burning Tree Wy	8,107	35	63.4	108
	Burning Tree Wy to Pebble Beach Dr	9,884	35	64.3	131
	Pebble Beach Dr to Fanita Pkwy	9,768	35	64.2	130
	Fanita Pkwy to Carlton Hills Blvd	11,104	35	64.8	148
Carlton Hills Boulevard	Mast Blvd to Carlton Oaks Dr	10,606	35	64.1	127
	Carlton Oaks Dr to Mission Gorge Rd	24,676	35	67.7	274

[1] Source: Project Traffic study prepared by Intersecting Metrics 2024

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

Roadway	Roadway Segment	Existing Noise Level @ 50-Feet (dBA Ldn)	Existing Plus Project Noise Level @ 50-Feet (dBA Ldn)	Project Related Noise Level Increase (dBA Ldn)
West Hills Parkway	Mast Blvd to Carlton Oaks Dr	68.0	68.3	0.3
	Carlton Oaks Dr to Mission Gorge Rd	67.4	67.7	0.3
Mast Boulevard	SR-52 EB Ramps to SR-52 WB Ramps	66.7	66.9	0.2
	SR-52 WB Ramps to West Hills Pkwy	70.2	70.3	0.1
Carlton Oaks Drive	West Hills Pkwy to Wethersfield Rd	61.8	62.9	1.1
	Wethersfield Rd to Burning Tree Wy	62.4	63.4	1.0
	Burning Tree Wy to Pebble Beach Dr	63.8	64.3	0.5
	Pebble Beach Dr to Fanita Pkwy	63.8	64.2	0.4
	Fanita Pkwy to Carlton Hills Blvd	64.5	64.8	0.3
Carlton Hills Boulevard	Mast Blvd to Carlton Oaks Dr	64.1	64.1	0.0
	Carlton Oaks Dr to Mission Gorge Rd	67.6	67.7	0.1

Cumulative Noise Impacts

To determine if cumulative off-site noise level increases associated with the development of the Project and other planned or permitted projects in the vicinity will create noise impacts. The noise levels for the Near-Term Year 2026 Project Buildout and other planned and permitted projects were compared with the existing conditions. Utilizing the Project's traffic assessment (Source: Intersecting Metrics 2024) noise contours were developed for the following traffic scenarios:

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

Existing Plus Cumulative Projects Plus Project: Current day 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 project and all other planned or permitted projects in the vicinity of the site.

The existing noise levels and reference distances to the 60 dBA Ldn contours for the roadways in the vicinity of the Project site are given in Table 5-3 above for the Existing Scenario. The near-term cumulative noise conditions are provided in Table 5-6. No noise barriers or topography that may affect noise levels were incorporated in the calculations.

Table 5-6: Existing + Project + Cumulative Noise Levels

Roadway	Roadway Segment	ADT[1]	Vehicle Speeds (MPH)[1]	Noise Level @ 50-Feet (dBA Ldn)	60 dBA Ldn Contour Distance (Feet)
West Hills Parkway	Mast Blvd to Carlton Oaks Dr	15,560	45	69.1	347
	Carlton Oaks Dr to Mission Gorge Rd	14,560	45	68.8	333
Mast Boulevard	SR-52 EB Ramps to SR-52 WB Ramps	18,330	40	68.2	295
	SR-52 WB Ramps to West Hills Pkwy	38,050	40	71.3	529
Carlton Oaks Drive	West Hills Pkwy to Wethersfield Rd	6,430	35	63.4	108
	Wethersfield Rd to Burning Tree Wy	7,070	35	63.8	118
	Burning Tree Wy to Pebble Beach Dr	9,480	35	64.6	141
	Pebble Beach Dr to Fanita Pkwy	9,290	35	64.5	137
	Fanita Pkwy to Carlton Hills Blvd	13,130	35	65.8	184
Carlton Hills Boulevard	Mast Blvd to Carlton Oaks Dr	12,130	35	64.7	146
	Carlton Oaks Dr to Mission Gorge Rd	28,510	35	68.5	318
[1] Source: Project Traffic study prepared by Intersecting Metrics 2024					

Table 5-7 presents the comparison of the Existing Year and the Near-Term Year 2026 Cumulative noise levels. The overall roadway segment noise levels will increase 0.6 to 1.5 dBA Ldn with the development of the Project and proposed cumulative projects. The cumulative noise increase is less than 3 dBA Ldn on any roadway segment.

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

Roadway	Roadway Segment	Existing Noise Level @ 50-Feet (dBA Ldn)	Existing Plus Project Plus Cumulative Noise Level @ 50-Feet (dBA Ldn)	Project Related Noise Level Increase (dBA Ldn)
West Hills Parkway	Mast Blvd to Carlton Oaks Dr	68.0	69.1	1.1
	Carlton Oaks Dr to Mission Gorge Rd	67.4	68.8	1.4
Mast Boulevard	SR-52 EB Ramps to SR-52 WB Ramps	66.7	68.2	1.5
	SR-52 WB Ramps to West Hills Pkwy	70.2	71.3	1.1
Carlton Oaks Drive	West Hills Pkwy to Wethersfield Rd	61.8	63.4	1.4
	Wethersfield Rd to Burning Tree Wy	62.4	63.8	1.4
	Burning Tree Wy to Pebble Beach Dr	63.8	64.6	0.8
	Pebble Beach Dr to Fanita Pkwy	63.8	64.5	0.7
	Fanita Pkwy to Carlton Hills Blvd	64.5	65.8	1.3
Carlton Hills Boulevard	Mast Blvd to Carlton Oaks Dr	64.1	64.7	0.6
	Carlton Oaks Dr to Mission Gorge Rd	67.6	68.5	0.9

5.4 Offsite Noise Findings and Mitigation

The Project does not create a direct or cumulative noise increase of more than 3 dBA Ldn on any area roadways. 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.

6.0 OPERATIONAL NOISE

This section examines the potential stationary 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 the following noise sources could all operate simultaneously.

- The park/playground at Residential West
- The swimming pool at Residential North
- The park/playground at Residential North
- Mechanical equipment at the hotel
- Mechanical equipment at the clubhouse building
- The swimming pool at the hotel
- Exterior live music at the clubhouse patio
- Interior music inside the clubhouse
- A wedding ceremony at the clubhouse patio or lawn
- Vehicles in the clubhouse/hotel parking lot
- Golf tournament announcements over PA speakers at the clubhouse patio or lawn

6.1 Reference Noise Levels

This section provides a detailed description of the reference noise level measurement results. It is important to note that the following projected noise levels assume the worst-case noise environment with the noise sources all occurring at the same time. In reality, these noise levels will vary throughout the day. The mechanical ventilation and vehicles at the clubhouse and hotel may operate during nighttime hours.

Park/Playground

Noise measurements were taken at an existing YMCA in La Jolla, CA by Ldn Consulting, Inc. on August 23, 2013. The measurements included approximately 20 children playing in an outdoor area. Based on empirical data collected, noise associated with children playing outdoors was 63 dBA at 35-feet. A worst-case noise level of 63 dBA at 35-feet will be utilized from the center of each playground area. The park in West Area Residential is located over 300 feet from the existing single-family residences to the north and will be shielded by the proposed homes. The park in North Area Residential is located over 100 feet from the existing single-family residences to the north. Therefore, noise levels associated will the parks and playgrounds will be well below the City's 65 dBA property line standard.

Pool Equipment Noise Levels

To determine the noise environment and to assess potential noise impacts, noise measurements were taken at an existing pool facility at the Cal-a-Vie Health Spa, located at 29402 Spa Haven Way, Vista, CA 92084. The measurements consisted of two 15 horsepower pool pumps and filtration pumps, which would be considered a worst-case configuration for the proposed development. All equipment was fully operational during the measurements. The short term measurements of the onsite pump operations and equipment was determined to be 57.8 dBA Leq at a distance of 25-feet.

Pool Activity Noise Levels

Noise level measurements of typical daily operations of outdoor pool activities was taken at the San Diego YMCA facility located in Oceanside on September 13th, 2009. The Oceanside YMCA measurement consisted of open swimming activities of 25 children in the main pool area. The measured noise levels from the existing facility were amortized over an hour and found to have a worst case noise level of 68.8 dBA Leq at a distance of 20-feet. The pool equipment noise levels were combined with the pool activities noise levels resulting in a cumulative noise reference level for the community pool areas of 67.4 dBA Leq at a distance of 25-feet. The pool area within North Area Residential is located over 300 feet from the existing single-family residences to the north and will be shielded by the proposed homes. Therefore, noise levels would be reduced to approximately 44 dBA and will be well below the City's 65 dBA property line threshold.

Air Conditioning Units

Rooftop mechanical ventilation units (HVAC) will be installed on the proposed clubhouse. In order to evaluate the HVAC noise impacts, the analysis utilized reference noise level measurements taken at a Von's Shopping Center 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. The hotel could require larger HVAC units with a cooling capacity of 20 tons having a reference noise level of 83 dBA at 3-feet (York, 2023).

Even though the mechanical ventilation system will cycle on and off throughout the day, this approach presents the worst-case noise condition. The noise levels associated with the roof-top mechanical ventilation system will be limited with the proposed parapet walls on each building that will vary in height but will be roughly 1-foot higher than the HVAC units to shield them both visually and acoustically. Hence, the parapet wall will block the line-of-sight from the adjacent residential units. To be conservative, no reductions for the parapet walls were taken into account.

Exterior Live Music

Reference noise levels were gathered in September 2019 at Miramonte Winery located at 33410 Rancho California Road in Temecula, CA. The site provided both an outdoor garden environment, with a low amplification speaker system and a performance by an acoustical guitarist. The noise levels of the acoustic guitarist were taken at a distance of 25 feet from the performer. The noise levels from the music at 25 feet was 63.2 dBA and 64.4 dBA. The noise measurements of the low amplification speaker system with the noise meter located directly in front of the speaker at a distance of 5 feet was found to be 68.1 dBA, which would equate to 54.1 dBA at 25 feet. The higher reference noise level of 64.4 dBA at a distance of 25 feet will be utilized to determine if any control measures are needed to comply with the City's noise limits.

Music from a DJ

Reference noise levels were gathered in December 2017 at an event center located at 7520 El Cajon Boulevard in El Cajon, CA and June 2018 at an event center located at 633 Montecito Way in Ramona, CA. The operational noise levels at both events consisted of a DJ system and the noise measurements were taken at a distance of 25 feet from the speakers with the noise meter located centrally between both speakers. The noise levels from the music at 25 feet was 71.3 dBA and 75.2 dBA over a one-hour period, respectively. The DJ can also reduce the volume resulting in lower noise levels if desired or needed.

The empirical data also found that the noise levels on the sides and behind the DJ stage drop 10 decibels due to the directional characteristics of the speakers. The higher reference noise level of 75.2 dBA at a distance of 25 feet will be utilized to determine if any control measures are needed to comply with the City's noise limits. Additionally, it was determined that if the music were located within an enclosed building, noise levels would be reduced a minimum of 20 dBA.

Wedding Event

Reference noise levels were gathered in June 2024 at a wedding event at the Monserate Winery located at 2757 Gird Road in Fallbrook CA. The wedding included a ceremony and music from a DJ located inside of the event building. Based on the noise measurements during the wedding, the loudest noise levels occurred during the reception with the DJ set up inside the building with the doors open. The noise levels during the reception were found to be 82.2 dBA at 20 feet.

Golf Tournament PA Announcements

Short-term sound level measurements were collected of a public announcement (PA) system at the Rancho Buena Vista Little League Field. These measurements were conducted during daytime hours without any activities on the fields (no players or spectators). The measurements included typical 15-20 second announcements and music playing for approximately 30 seconds. The noise levels were found to be 44.0 dBA at a distance of 220 feet, however, based on the short nature of the announcements, would be reduced to a noise level of 38.0 dBA. This equates to an approximate noise level of 57 dBA at 25 feet.

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. The project proposes a total of 293 parking spaces at the hotel and clubhouse and would not generate a significant amount of noise related activities. 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 distance separation to the property lines no noise impacts are anticipated.

6.2 Cumulative Noise Levels

The noise levels for each source at the hotel/golf course and North Area Residential along with the calculated hourly noise levels based upon individual operating times are shown below in Table 6-1 for the nearest residential property lines to the north and in Table 6-2 for the nearest residential property line to the east. Also included in Tables 6-1 and 6-2 are the relative property line standards for clarity. It should be noted that West Area Residential is located over 3,000 feet to the west and would not cumulatively add to the noise levels. No reductions from any parapet walls were incorporated into the modeling. Based upon the property line noise levels determined above, the proposed developments related operational noise levels comply with the noise standards at the property lines. No Impacts are anticipated and no mitigation is required.

Table 6-1: Property Line Noise Levels (Northern Property Line)

Source	Distance from Source to Measurement Location (Feet)	Measured Noise Level (dBA)	Quantity	Distance to Property Line (Feet)	Noise Reduction due to distance (dBA)	Resultant Noise Level @ Property Line (dBA)
Pool (NAR)	25	67.4	1	365	-23.3	44.1
Park/Playground (NAR)	35	63	1	100	-9.1	53.9
HVAC (Hotel)	3	83	6	768	-48.2	42.6
HVAC (Clubhouse)	6	65.9	6	664	-40.9	32.8
Pool (Hotel)	25	67.4	1	698	-28.9	38.5
Outdoor Music	25	64.4	1	728	-29.3	35.1
Indoor Music	25	55.2	1	642	-28.2	27.0
Wedding Ceremony	20	82.2	1	688	-30.7	51.5
Parking Lot	25	65	1	384	-23.7	41.3
Golf Tournament	25	57	1	818	-30.3	26.7
Cumulative Noise Level @ Property Line (dBA)						**57**
Property Line Standard for Single-Family Residential						**65**

Table 6-2: Property Line Noise Levels (Eastern Property Line)

Source	Distance from Source to Measurement Location (Feet)	Measured Noise Level (dBA)	Quantity	Distance to Property Line (Feet)	Noise Reduction due to distance (dBA)	Resultant Noise Level @ Property Line (dBA)
Pool (NAR)	25	67.4	1	1510	-35.6	31.8
Park/Playground (NAR)	35	63	1	1620	-33.3	29.7
HVAC (Hotel)	3	83	6	790	-48.4	42.4
HVAC (Clubhouse)	6	65.9	6	674	-41.0	32.7
Pool (Hotel)	25	67.4	1	864	-30.8	36.6
Outdoor Music	25	64.4	1	692	-28.8	35.6
Indoor Music	25	55.2	1	644	-28.2	27.0
Wedding Ceremony	20	82.2	1	654	-30.3	51.9
Parking Lot	25	65	1	796	-30.1	34.9
Golf Tournament	25	57	1	572	-27.2	29.8
Cumulative Noise Level @ Property Line (dBA)						**53**
Property Line Standard for Single-Family Residential						**65**

6.3 Sewer Lift Station Noise Levels

In addition to the onsite noise sources identified in the previous section, the project would include a sewer lift station. The lift station would be located at the eastern end of the Residential West development. Based on information from the Supplemental Sewer Study for the project (Dexter Wilson Engineering, Inc. 2022), the pump station is expected to include two submersible sewage pumps in a precast-concrete wet well. Each pump would be capable of pumping the total lift station design flow; thus, there would be 100-percent redundancy for the mechanical equipment. The lift station would have emergency power generation, emergency sewer storage, emergency force-main connections, and odor-control equipment, including a chemical scrubber at the wet well (with provisions for adding a more aggressive odor-control system, if necessary). The emergency power generator would be mounted on an exterior concrete pad to provide backup power if commercial power were to go out. The emergency power generator would have a sound-attenuated, weatherproof enclosure. The final design of the sewer lift station, including detailed hydraulic calculations for proper pump selection and wet-well sizing, would be undertaken concurrently with the preparation of final engineering and improvement plans for the project.

Use of the emergency generator would qualify as "emergency work" under the City Municipal Code, and would be exempt from the noise standards, provided its operation complies with the municipal code requirements that (1) the Noise Control Officer is notified in advance, if possible, or as soon as practical after any emergency requiring the use of the generator, and (2) the emergency generator is designed, modified or equipped to reduce sounds produced to the lowest possible level consistent with its effective operation. Because these are regulatory requirements of the City's municipal code, it is assumed they will be implemented as part of the project and, therefore, emergency generator noise impacts will be less than significant.

The equipment noise levels were modeled to the nearest existing residences to the east. The following equipment consist of the potential noise sources at the proposed sewer lift station.

Pumps

Based on a similar underground pump station, the pumps would generate a noise level of 45 dBA at a distance of 15 feet from the access hatch (Harmony Grove Village – Pacific Noise Control, dated 7/24/06).

Transformer

The proposed transformer has an unshielded noise rating of less than 51 dBA at 5 feet *(Source: National Electric Manufactures Association (NEMA) Publication No. TR 1-1993)*.

Generator

To assess the generator noise levels, tested outdoor sound levels were provided by the manufacturer/supplier. The noise ratings provided, indicate the generator will produce noise levels of 75 dBA during weekly engine exercise and during normal operation when measured at a distance of 23-feet in all directions. The manufacturer specifications are provided in ***Attachment B*** to this report.

Cumulative Noise Levels

The noise levels for each of the sources were combined to determine the cumulative noise levels at the proposed residential property line to the west. Additionally, the project is proposing 6-foot high fencing around the perimeter of the pump station which would reduce the noise levels a minimum 5 dBA. The source levels have been adjusted to account for the 5 dBA reduction. The projection includes the pumps, transformer, and generator operating at the same time. Although it is unlikely all the noise sources would be operating at the same time, this method is considered ultra conservative in determining impact potential. The cumulative noise levels at the proposed residential property line to the west is listed in Table 6-3 below.

Table 6-3: Property Line Noise Levels

Source	Distance from Source to Measurement Location (Feet)	Measured Noise Level (dBA)	Distance to Nearest Property Line (Feet)	Noise Reduction due to distance (dBA)	Resultant Noise Level @ Property Line (dBA)
Pumps	15	40	30	-6	34
Transformer	5	46	34	-17	29
Generator	23	70	48	-6	64
Cumulative Noise Level @ Property Line (dBA)					**64**

The resultant cumulative noise level at the proposed residential property line to the west is projected to be at or below 60 dBA Leq. Additionally, the existing residential property line to the north is located further away, further reducing the anticipated noise levels. Therefore, cumulatively the proposed sewer lift station related operational noise levels comply with the daytime and nighttime noise standards at the existing residential uses to the north and the proposed residential uses to the west.

7.0 REFERENCES

Atelier5 Design2024 *Carlton Oaks Country Club Concept Drawing*

Caltrans2020 *Transportation Related Earthborne Vibration, Caltrans Experiences*

FTA2018 *Transit Noise and Vibration Impact Assessment*

Google2024

Google Earth Pro2024

Hunsaker & Associates 2025 *Residential North Site Plan*

Hunsaker & Associates 2025 *Residential West Site Plan*

Intersecting Metrics2024 *Carlton Oaks Country Club and Resort Local Transportation Analysis*

York2023 *Technical Guide*

ATTACHMENT A

FRESNEL BARRIER CALCULATIONS

SR-52
Source to Receiver Horizontal Distance (ft) = 234.00
Source to Barrier Horizontal Distance (ft) = 88.00
Barrier to Receiver Horizontal Distance (ft) = 146.00
Source Height (ft) = 40.00
Receiver Height (ft) = 18.00
Barrier Height (ft) = 43.00
Distance Source to Receptor (ft) d = 235.03
Distance Source to Barrier top (ft) d1 = 88.05
Distance Barrier top to Receiver (ft) d2 = 148.12

Frequency (Hz) = 8000 Attenuation (db) = 17.6 Fresnel N = 16.244
Frequency (Hz) = 4000 Attenuation (db) = 15.8 Fresnel N = 8.122
Frequency (Hz) = 2000 Attenuation (db) = 14.1 Fresnel N = 4.061
Frequency (Hz) = 1000 Attenuation (db) = 12.5 Fresnel N = 2.030
Frequency (Hz) = 500 Attenuation (db) = 10.8 Fresnel N = 1.015
Frequency (Hz) = 250 Attenuation (db) = 9.2 Fresnel N = 0.508
Frequency (Hz) = 125 Attenuation (db) = 7.7 Fresnel N = 0.254
Frequency (Hz) = 63 Attenuation (db) = 6.5 Fresnel N = 0.127

W Hills Parkway
Source to Receiver Horizontal Distance (ft) = 132.00
Source to Barrier Horizontal Distance (ft) = 122.00
Barrier to Receiver Horizontal Distance (ft) = 10.00
Source Height (ft) = 18.00
Receiver Height (ft) = 18.00
Barrier Height (ft) = 19.00
Distance Source to Receptor (ft) d = 132.00
Distance Source to Barrier top (ft) d1 = 122.00
Distance Barrier top to Receiver (ft) d2 = 10.05

Frequency (Hz) = 8000 Attenuation (db) = 10.1 Fresnel N = 0.766
Frequency (Hz) = 4000 Attenuation (db) = 8.6 Fresnel N = 0.383
Frequency (Hz) = 2000 Attenuation (db) = 7.2 Fresnel N = 0.192
Frequency (Hz) = 1000 Attenuation (db) = 6.0 Fresnel N = 0.096
Frequency (Hz) = 500 Attenuation (db) = 4.9 Fresnel N = 0.048
Frequency (Hz) = 250 Attenuation (db) = 4.0 Fresnel N = 0.024
Frequency (Hz) = 125 Attenuation (db) = 3.2 Fresnel N = 0.012
Frequency (Hz) = 63 Attenuation (db) = 3.0 Fresnel N = 0.006

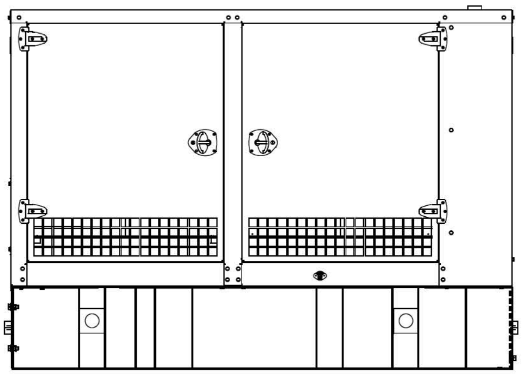
Carlton Oaks Drive
Source to Receiver Horizontal Distance (ft) = 60.00
Source to Barrier Horizontal Distance (ft) = 50.00
Barrier to Receiver Horizontal Distance (ft) = 10.00
Source Height (ft) = 50.00
Receiver Height (ft) = 50.00
Barrier Height (ft) = 51.00
Distance Source to Receptor (ft) d = 60.00
Distance Source to Barrier top (ft) d1 = 50.01
Distance Barrier top to Receiver (ft) d2 = 10.05

Frequency (Hz) = 8000 Attenuation (db) = 10.4 Fresnel N = 0.850
Frequency (Hz) = 4000 Attenuation (db) = 8.8 Fresnel N = 0.425
Frequency (Hz) = 2000 Attenuation (db) = 7.4 Fresnel N = 0.213
Frequency (Hz) = 1000 Attenuation (db) = 6.2 Fresnel N = 0.106
Frequency (Hz) = 500 Attenuation (db) = 5.1 Fresnel N = 0.053
Frequency (Hz) = 250 Attenuation (db) = 4.1 Fresnel N = 0.027
Frequency (Hz) = 125 Attenuation (db) = 3.3 Fresnel N = 0.013
Frequency (Hz) = 63 Attenuation (db) = 3.0 Fresnel N = 0.007

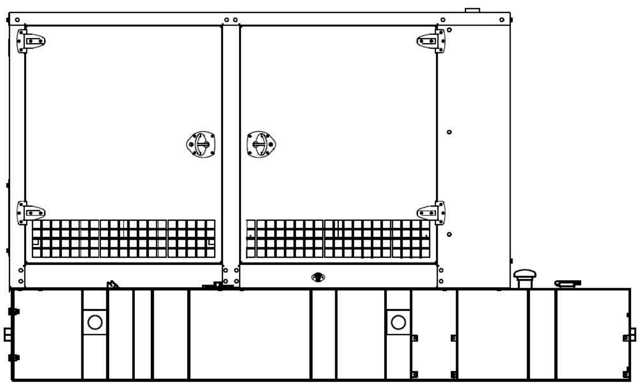
<u>ATTACHMENT B</u>

GENERATOR SPECIFICATIONS

Weather/Sound Enclosure and Subbase Fuel Tank Package



Enclosure with Standard Subbase Fuel Tank



Enclosure with State Code Subbase Fuel Tank

Available Approvals and Listings

- ❑ UL 2200 Listing
- ❑ CSA Certified
- ❑ IBC Seismic Certification *
- ❑ California OSHPD Approval *
- ❑ cUL Listing (fuel tanks only)
- ❑ Hurricane Rated Enclosure - Available on Sound Aluminum 80-150kW Models

NOTE: Some models may have limited third-party approvals; see your local distributor for details.

* Requires a state code subbase fuel tank selection.

Applicable to the following:

40REOZJC
50/60REOZJD
80/100/150/200REOZJF
125/180REOZJG
230-275REOZJE
300REOZJ

Weather Enclosure Standard Features

- Internal-mounted silencer and flexible exhaust connector.
- Lift base or tank-mounted, steel construction with hinged doors.
- Fade-, scratch-, and corrosion-resistant Kohler® Power Armor™ automotive-grade textured finish.
- Enclosure has four access doors which allow for easy maintenance.
- Lockable, flush-mounted door latches.
- Vertical air inlet and outlet discharge to redirect air and reduce noise.
- Weather enclosure is designed to150 mph (241 kph) wind load rating.

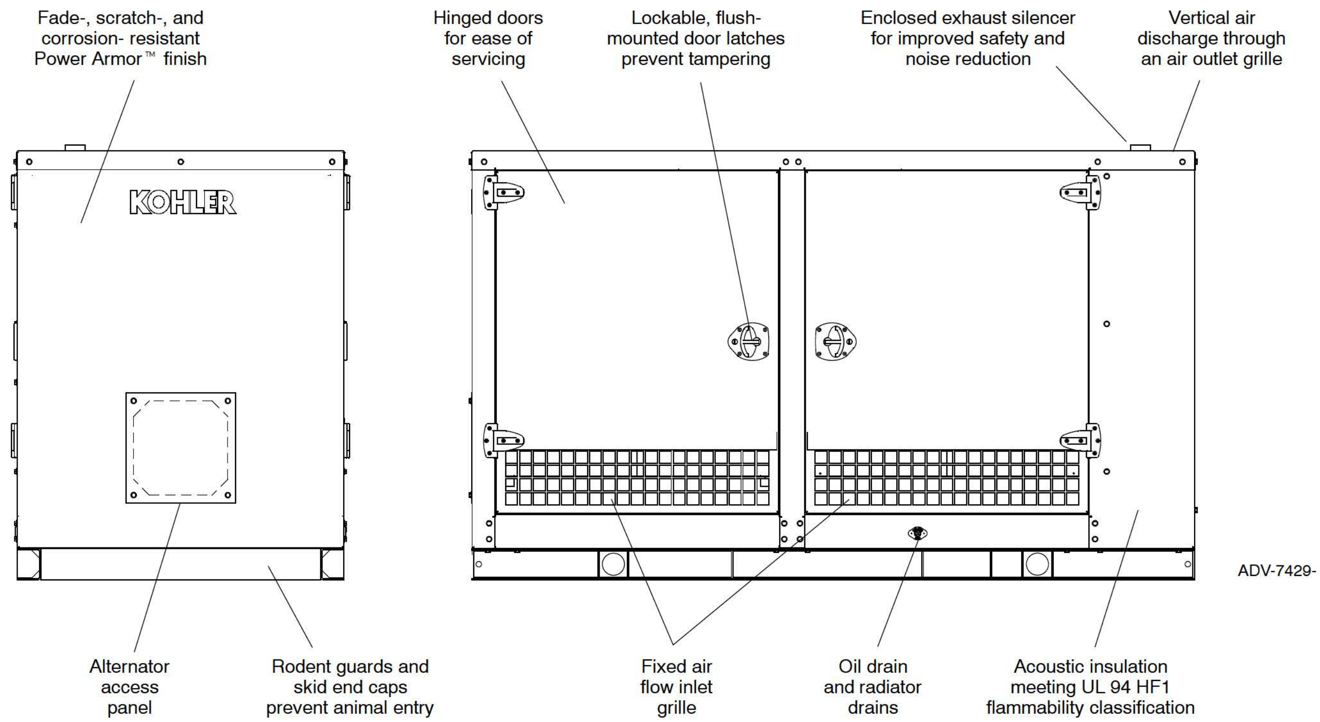
Sound Enclosure Standard Features

- Includes all of the weather enclosure features with the addition of acoustic insulation material.
- Lift base or tank-mounted, steel or aluminum construction with hinged doors. Aluminum enclosures are recommended for high humidity and/or high salt/ coastal regions.
- Acoustic insulation that meets UL 94 HF1 flammability classification and repels moisture absorption.
- Sound-attenuated enclosure that uses up to 51 mm (2 in.) of acoustic insulation.
- Steel sound enclosure is designed to150 mph (241 kph) wind load rating.
- Aluminum sound enclosure is certified to 186 mph (299 kph) wind load rating for 80-150REOZJ models.
- Aluminum sound enclosure is certified to 181 mph (291 kph) wind load rating for 180-300REOZJ models.

Subbase Fuel Tank Features

- The fuel tank has a Power Armor Plus™ textured epoxy-based rubberized coating.
- The above-ground rectangular secondary containment tank mounts directly to the generator set, below the generator set skid (subbase).
- Both the inner and outer tanks have emergency relief vents.
- Flexible fuel lines are provided with subbase fuel tank selection.
- The secondary containment generator set base tank meets UL 142 tank requirements. The inner (primary) tank is sealed inside the outer (secondary) tank. The outer tank contains the fuel if the inner tank leaks or ruptures.
- State tanks with varying capacities are an available option. Florida Dept. of Environmental Protection (FDEP) File No. EQ-634 approved.

Weather and Sound Enclosure



Note: 40REOZJC model shown, other models are similar. Refer to the respective ADV drawings for details.

Enclosure Features

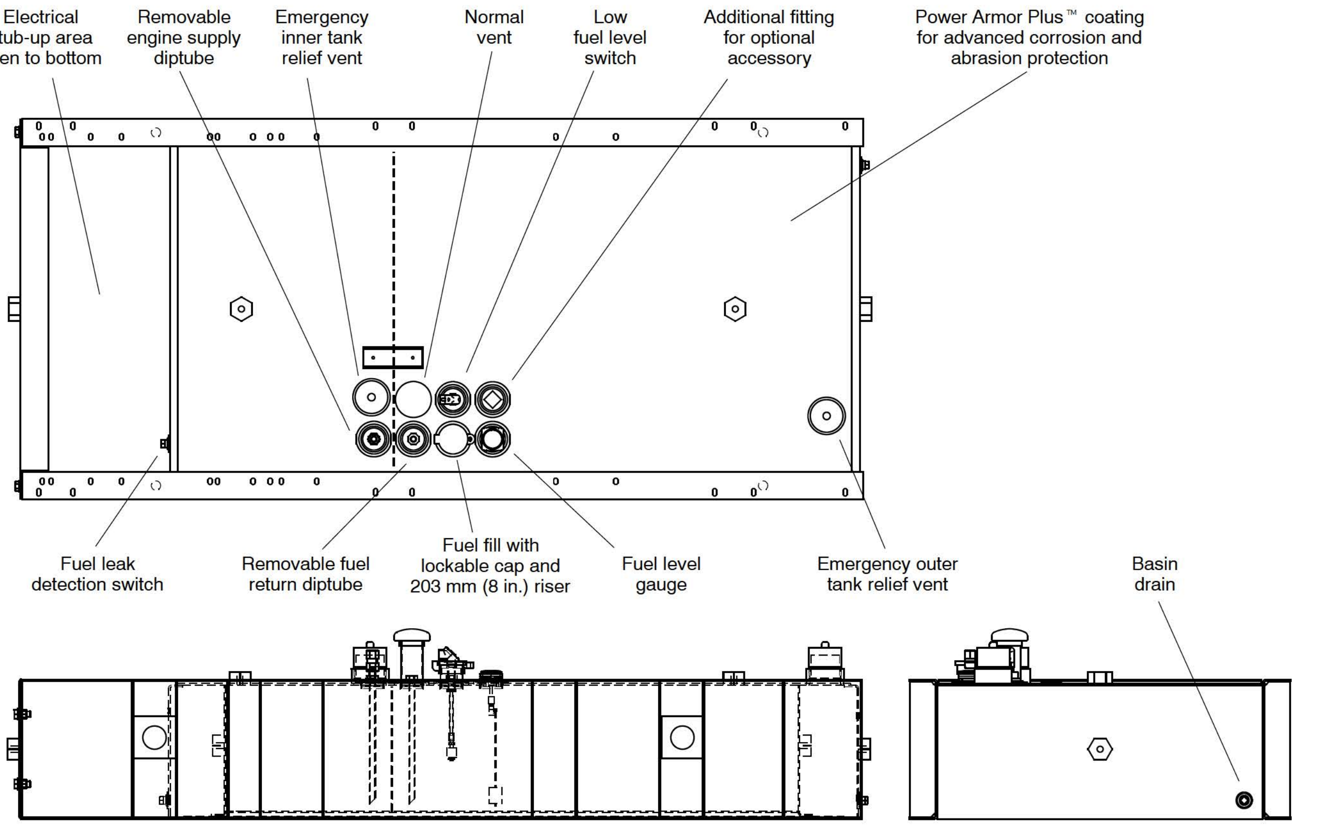
- Available in steel (14 gauge) formed panel, solid construction. Preassembled package offering corrosion resistant, dent resilient structure mounting directly to lift base or fuel tank.
- Power Armor™ automotive-grade finish resulting in advanced corrosion and abrasion protection as well as enhanced edge coverage and color retention.
- Internal exhaust silencer offering maximum component life and operator safety.

  NOTE: Installing an additional length of exhaust tail pipe may increase backpressure levels. Please refer to the generator set spec sheet for the maximum backpressure value.
- Interchangeable modular panel construction. Allows complete serviceability or replacement without compromising enclosure design.
- Cooling/combustion air intake with a horizontal air inlet. Sized for maximum cooling airflow.
- Service access. Multi-personnel doors for easy access to generator set control and servicing of the fuel fill, fuel gauge, oil fill, and battery.
- Cooling air discharge. Weather protective design featuring a vertical air discharge outlet grille. Redirects cooling air up and above enclosure to reduce ambient noise.

Additional Sound Enclosure Features

- Available in steel (14 gauge) or aluminum 3.2 mm (0.125 in.) formed panel, solid construction.
- Sound-attenuated design. Acoustic insulation UL 94 HF1 listed for flame resistance offering up to 51 mm (2 in.) mechanically restrained acoustic insulation.
- Cooling air discharge. The sound enclosures include acoustic insulation with urethane film.
- Snow package enclosure is designed to meet NFPA 110 requirement to −20°C (−4°F).

Subbase Fuel Tank



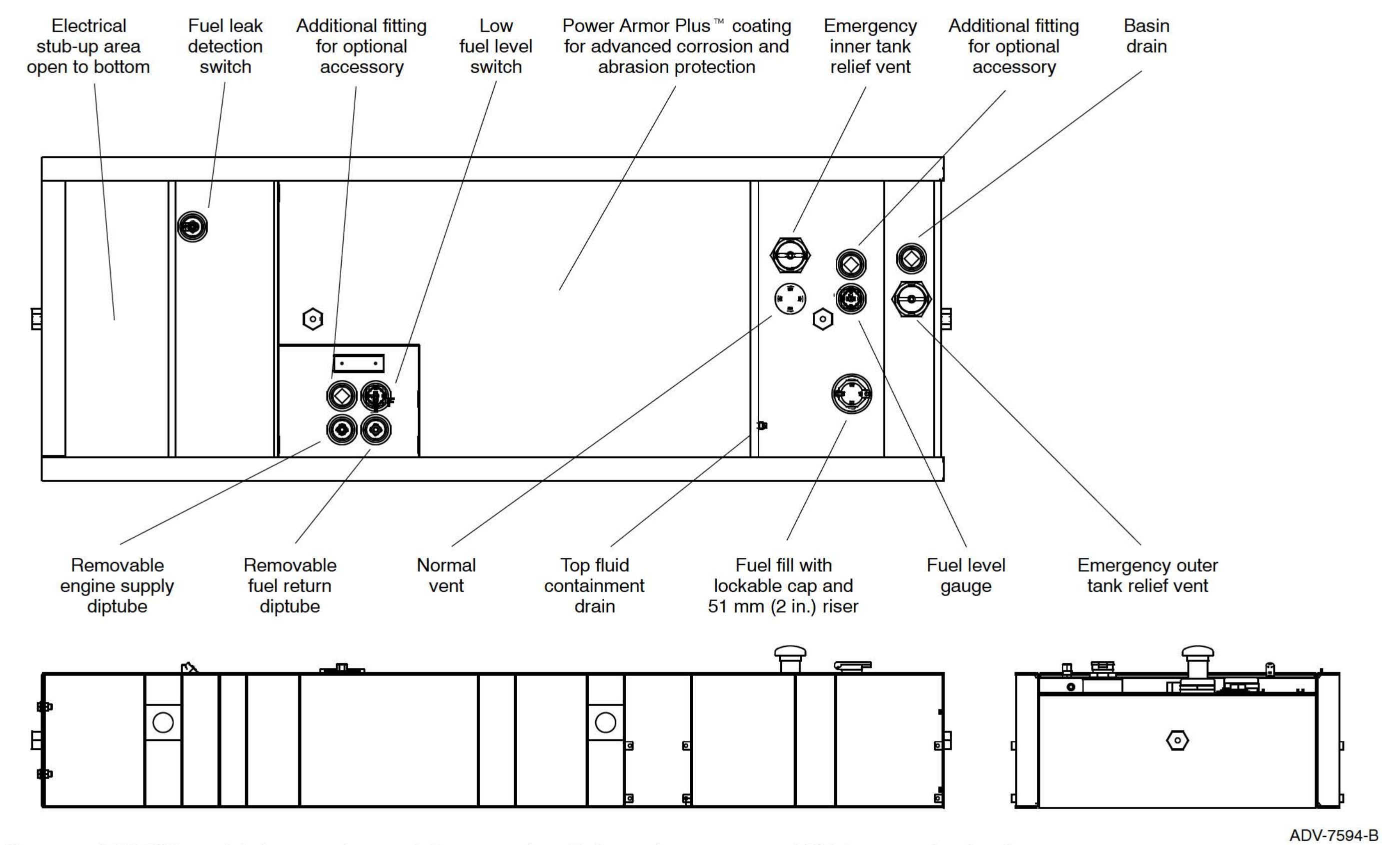
Note: 40REOZJC model shown, other models are similar. Refer to the respective ADV drawings for details.

Standard Subbase Fuel Tank Features

- Extended operation. Usable tank capacity offers full load standby operation of up to 96 hours on select models.
- Power Armor Plus™ textured epoxy-based rubberized coating that creates an ultra-thick barrier between the tank and harsh environmental conditions like humidity, saltwater, and extreme temperatures, and provides advanced corrosion and abrasion protection.
- UL listed. Secondary containment generator set base tank meeting UL 142 requirements.
- NFPA compliant. Designed to comply with the installation standards of NFPA 30 and NFPA 37.
- Integral external lift lugs. Enables crane with spreader-bar lifting of the complete package (empty tank, mounted generator set, and enclosure) to ensure safety.
- Emergency pressure relief vents. Vents ensure adequate venting of the inner and outer tank under extreme pressure and/or emergency conditions.
- Normal vent with cap. Vent is raised above lockable fuel fill.
- Low fuel level switch. Annunciates a 50% low fuel level condition at generator set control.
- Leak detection switch. Annunciates a contained primary tank fuel leak condition at generator set control.
- Electrical stub-up.

NOTE: For IBC Seismic Certification and/or California OSHPD Approval, see State Code Subbase Fuel Tank.

State Code Subbase Fuel Tank



Note: 40REOZJC model shown, other models are similar. Refer to the respective ADV drawings for details.

State Code Subbase Fuel Tank Features

- State tank designed to comply with the installation standards of the Florida Dept. of Environmental Protection (FDEP) File No. EQ-634.
- Includes all of the Standard Subbase Fuel Tank Features.

State Code Subbase Fuel Tank Options

Bottom Clearance

❑ I-beams, provides 106 mm (4.2 in.) of ground clearance

Fuel in Basin Options

❑ Fuel in basin switch, Florida Dept. of Environmental Protection (FDEP) File No. EQ-682 approved

Fuel Fill Options

❑ Fill pipe extension to within 152 mm (6 in.) of bottom of fuel tank.

❑ 18.9 L (5 gallon) spill containment with 95% shutoff

❑ 18.9 L (5 gallon) spill containment

❑ 18.9 L (5 gallon) spill containment fill to within 152 mm (6 in.) of bottom of fuel tank

❑ 28.4 L (7.5 gallon) spill containment, Florida Dept. of Environmental Protection (FDEP) File No. EQ-882 approved

❑ 28.4 L (7.5 gallon) spill containment with 95% shutoff, Florida Dept. of Environmental Protection (FDEP) File No. EQ–882/ EQ-883 approved

Fuel Supply Options

❑ Fire safety valve (installed on fuel supply line)

❑ Ball valve (installed on fuel supply line)

High Fuel Level Switch

❑ High fuel level switch

❑ High fuel level switch, Florida Dept. of Environmental Protection (FDEP) File No. EQ-682 approved

Normal Vent Options

❑ 3.7 m (12 ft.) above grade (without spill containment)

❑ 3.7 m (12 ft.) above grade (with spill containment)

Tank Marking Options

❑ Decal, Combustible Liquids – Keep Fire Away (qty. 2)

❑ Decal, NFPA 704 identification (qty. 2)

❑ Decal, tank number and safe fuel fill height (qty. 2)

❑ Decal, tank number and safe fuel fill height, NFPA 704 identification

Fluid Containment Options

❑ 100% engine fluid containment

Third-Party Approvals

❑ IBC Seismic Certification

❑ California OSPHD Approval

Enclosure and Subbase Fuel Tank Specifications

Fuel Tank Capacity, L (gal.)	Est. Fuel Supply Hours at 60 Hz with Full Load, Nominal/ Actual	Enclosure and Subbase Fuel Tank					Fuel Tank Height (or additional skid height with no tank), mm (in.)	Sound Pressure Level at 60 Hz with Full Load, Weather/ Sound, dB(A)‡
		Max. Dimensions, mm (in.)			Max. Weight, kg (lb.) *			
		Length	Width	Height	With Steel Enclosure	With Aluminum Enclosure		
40REOZJC Standard Fuel Tank								
No Tank	0	2320 (91.3)	1077 (42.4)	1521 (60.0)	966 (2130)	853 (1880)	100 (4)	78/65
424 (112)	24/32			1827 (71.9)	1223 (2697)*	1110 (2447)*	406 (16)	
621 (164)	48/48			1980 (78.0)	1274 (2809)*	1161 (2559)*	559 (22)	
946 (250)	72/73			2234 (88.0)	1555 (3429)*	1442 (3179)*	813 (32)	
40REOZJC State Code Fuel Tank †								
439 (116)	24/34	2896 (114)	1077 (42.4)	1883 (74.1)	1451 (3199)*	1338 (2949)*	356 (14)	78/65
958 (253)	72/74			2213 (87.1)	1575 (3472)*	1462 (3222)*	686 (27)	
50REOZJD Standard Fuel Tank								
No Tank	0	2320 (91.3)	1077 (42.4)	1521 (59.9)	1027 (2265)	914 (2015)	100 (4)	78/66
424 (112)	24/26			1827 (71.9)	1285 (2832)*	1171 (2582)*	406 (16)	
621 (164)	36/38			1980 (78.0)	1335 (2944)*	1222 (2694)*	559 (22)	
946 (250)	48/58			2234 (88.0)	1555 (3429)*	1442 (3179)*	813 (32)	
50REOZJD State Code Fuel Tank †								
439 (116)	24/26	2896 (114)	1077 (42.4)	1883 (74.1)	1529 (3371)*	1416 (3121)*	356 (14)	78/66
958 (253)	48/58			2213 (87.1)	1653 (3644)*	1540 (3394)*	686 (27)	
1408 (372)	72/86			2441 (96.1)	1804 (3977)*	1691 (3727)*	914 (36)	
60REOZJD Standard Fuel Tank								
No Tank	0	2320 (91.3)	1077 (42.4)	1521 (59.9)	1164 (2566)	1051 (2316)	100 (4)	78/68
492 (130)	24/26			1878 (73.9)	1438 (3170)*	1324 (2920)*	457 (18)	
783 (207)	36/41			2107 (83.0)	1514 (3338)*	1401 (3088)*	686 (27)	
946 (250)	48/50			2234 (88.0)	1555 (3429)*	1442 (3179)*	813 (32)	
60REOZJD State Code Fuel Tank †								
556 (147)	24/29	2895 (114)	1077 (42.4)	1959 (77.1)	1616 (3563)*	1503 (3313)*	432 (17)	78/68
958 (253)	48/50			2213 (87.1)	1767 (3896)*	1654 (3646)*	686 (27)	
1408 (372)	72/74			2441 (96.1)	1918 (4228)*	1805 (3978)*	914 (36)	
80REOZJF Standard Tank								
No Tank	0	2821 (111.1)	1156 (45.5)	1723 (67.8)	1483 (3269)	1351 (2979)	150 (6)	83/69
791 (209)	24/30			2081 (81.9)	1766 (3894)*	1635 (3604)*	508 (20)	
1317 (348)	48/50			2386 (93.9)	1882 (4150)*	1751 (3860)*	813 (32)	
80REOZJF State Code Fuel Tank †								
814 (215)	24/31	3400 (133.9)	1156 (45.5)	2111 (83.1)	1996 (4400)*	1864 (4110)*	432 (17)	83/69
1571 (415)	48/60			2441 (96.1)	2236 (4929)*	2104 (4639)*	762 (30)	
3089 (816)	96/113	3607 (142.0)	1829 (72.0)	2536 (99.8)	3058 (6741)*	2933 (6466)*	813 (32.0)	

Note: Data in table is for reference only, refer to the respective ADV drawings for details.

* Max. weight includes the generator set (wet) using the largest alternator option, enclosure with acoustic insulation added, silencer, and tank (no fuel).

† State code fuel tank specifications (height and weight) include I-beam option.

‡ Log average sound pressure level of 8 measured positions around the perimeter of the unit at a distance of 7 m (23 ft). Refer to TIB-114 for details.

Enclosure and Subbase Fuel Tank Specifications (continued)

Fuel Tank Capacity, L (gal.)	Est. Fuel Supply Hours at 60 Hz with Full Load, Nominal/ Actual	Enclosure and Subbase Fuel Tank					Fuel Tank Height (or additional skid height with no tank), mm (in.)	Sound Pressure Level at 60 Hz with Full Load, Weather/ Sound, dB(A)‡
		Max. Dimensions, mm (in.)			Max. Weight, kg (lb.) *			
		Length	Width	Height	With Steel Enclosure	With Aluminum Enclosure		
100REOZJF Standard Tank								
No Tank	0	2821 (111.1)	1156 (45.5)	1723 (67.8)	1592 (3510)	1461 (3220)	150 (6)	82/69
791 (209)	24/25			2081 (81.9)	1875 (4134)*	1744 (3844)*	508 (20)	
1696 (448)	48/54	3400 (133.9)		2386 (93.9)	2070 (4564)*	1939 (4274)*	813 (32)	
100REOZJF State Code Fuel Tank †								
814 (215)	24/26	3400 (133.9)	1156 (45.5)	2111 (83.1)	2105 (4641)*	1974 (4351)*	432 (17)	82/69
1571 (415)	48/50			2441 (96.1)	2345 (5170)*	2214 (4880)*	762 (30)	
3089 (816)	96/96	3607 (142.0)	1829 (72.0)	2536 (99.8)	3167 (6981)*	3042 (6706)*	813 (32.0)	
125REOZJG Standard Fuel Tank								
No Tank	0	3532 (139.0)	1153 (45.4)	1739 (68.5)	1651 (3632)	1515 (3333)	0 (0)	87/73
1128 (298)	24/30			2222 (87.5)	2400 (5280)*	2264 (4981)*	483 (19)	
2207 (583)	48/58			2653 (104.4)	2751 (6052)*	2615 (5753)*	914 (36)	
125REOZJG State Code Fuel Tank †								
1196 (316)	24/31	4414 (173.8)	1153 (45.4)	2328 (91.7)	2382 (5240)*	2446 (4941)*	483 (19)	87/73
2252 (595)	48/60			2683 (105.6)	2654 (5839)*	2500 (5511)*	838 (33)	
4403(1163)	96/113	4445 (175.0)	1829 (72.0)	2654 (104.5)	3707 (8173)*	3571 (7873)*	914 (36.0)	
150REOZJF Standard Fuel Tank								
No Tank	0	3532 (139.0)	1153 (45.4)	1739 (68.5)	1860 (4101)	1724 (3800)	0 (0)	86/75
1128 (298)	24/25			2222 (87.5)	2609 (5752)*	2473 (5452)*	483 (19)	
2207 (583)	48/49			2653 (104.4)	2960 (6526)*	2824 (6226)*	914 (36)	
150REOZJF State Code Fuel Tank †								
1196 (316)	24/27	4414 (173.8)	1153 (45.4)	2328 (91.7)	2591 (5712)*	2455 (5412)*	483 (19)	86/75
2252 (595)	48/50			2683 (105.6)	2890 (6361)*	2727 (6012)*	838 (33)	
4403(1163)	96/95	4445 (175.0)	1829 (72.0)	2654 (104.5)	3839 (8463)*	3702 (8163)*	914 (36.0)	
180REOZJG Standard Fuel Tank								
No Tank	0	4094 (161.2)	1338 (52.7)	2038 (80.2)	1928 (4250)	1780 (3925)	0 (0)	85/72
1514 (400)	24/31			2521 (99.3)	2861 (6307)*	2713 (5981)*	483 (19)	
2869 (758)	48/58			2927 (115.2)	3255 (7176)*	3107 (6850)*	889 (35)	
180REOZJG State Code Fuel Tank †								
1556 (416)	24/32	5008 (197.2)	1338 (52.7)	2601 (102.4)	3162 (6971)*	3014 (6646)*	457 (18)	85/72
2896 (765)	48/59			2906 (114.4)	3488 (7690)*	3340 (7363)*	762 (30)	
5742(1517)	96/106	5436 (214.0)	1829 (72.0)	2935 (115.5)	3760 (8289)*	3474 (7659)*	914 (36.0)	
200REOZJF Standard Fuel Tank								
No Tank	0	4094 (161.2)	1338 (52.7)	2025 (79.7)	2309 (5090)	2161 (4764)	0 (0)	87/75
1514 (400)	24/26			2508 (98.7)	3242 (7147)*	3094 (6821)*	483 (19)	
2869 (758)	48/49			2914 (114.7)	3636 (8016)*	3488 (7690)*	889 (35)	
200REOZJF State Code Fuel Tank †								
1575 (416)	24/27	5008 (197.2)	1338 (52.7)	2588 (101.9)	3543 (7811)*	3395 (7485)*	457 (18)	87/75
2896 (765)	48/50			2893 (113.9)	4050 (8930)*	3721 (8203)*	762 (30)	
5742(1517)	96/95	5436 (214.0)	1829 (72.0)	2935 (115.5)	4236 (9339)*	3950 (8709)*	914 (36.0)	

Note: Data in table is for reference only, refer to the respective ADV drawings for details.

* Max. weight includes the generator set (wet) using the largest alternator option, enclosure with acoustic insulation added, silencer, and tank (no fuel).

† State code fuel tank specifications (height and weight) include I-beam option.

‡ Log average sound pressure level of 8 measured positions around the perimeter of the unit at a distance of 7 m (23 ft). Refer to TIB-114 for details.

Enclosure and Subbase Fuel Tank Specifications (continued)

Fuel Tank Capacity, L (gal.)	Est. Fuel Supply Hours at 60 Hz with Full Load, Nominal/ Actual	Enclosure and Subbase Fuel Tank					Fuel Tank Height (or additional skid height with no tank), mm (in.)	Sound Pressure Level at 60 Hz with Full Load, Weather/ Sound, dB(A)‡
		Max. Dimensions, mm (in.)			Max. Weight, kg (lb.) *			
		Length	Width	Height	With Steel Enclosure	With Aluminum Enclosure		
230REOZJE Standard Fuel Tank								
No Tank	0	4121 (162.3)	1338 (52.7)	2153 (84.8)	2654 (5850)	2540 (5600)	260 (10)	87/75
1787 (472)	24/29			2655 (104.5)	3561 (7850)*	3447 (7600)*	762 (30)	
230REOZJE State Code Fuel Tank †								
2101 (555)	24/34	5009 (197.2)	1338 (52.7)	2894 (113.9)	3895 (8587)*	3782 (8337)*	635 (25)	87/75
3573 (944)	48/58	5325 (209.7)		3173 (124.9)	4504 (9930)*	4391 (9680)*	914 (36)	
250REOZJE Standard Fuel Tank								
No Tank	0	4121 (162.3)	1338 (52.7)	2153 (84.8)	2699 (5950)	2585 (5700)	260 (10)	89/75
1787 (472)	24/26			2655 (104.5)	3606 (7950)*	3493 (7700)*	762 (30)	
250REOZJE State Code Fuel Tank †								
2101 (555)	24/31	5009 (197.2)	1338 (52.7)	2894 (113.9)	3940 (8687)*	3827 (8437)*	635 (25)	89/75
3573 (944)	48/53	5325 (209.7)		3173 (124.9)	4550 (10030)*	4436 (9780)*	914 (36)	
275REOZJE Standard Fuel Tank								
No Tank	0	4121 (162.3)	1338 (52.7)	2153 (84.8)	2835 (6250)	2722 (6000)	260 (10)	89/75
1787 (472)	24/24			2655 (104.5)	3742 (8250)*	3629 (8000)*	762 (30)	
275REOZJE State Code Fuel Tank †								
2101 (555)	24/28	5009 (197.2)	1338 (52.7)	2894 (113.9)	4076 (8987)*	3963 (8737)*	635 (25)	89/75
3573 (944)	48/48	5325 (209.7)		3173 (124.9)	4686 (10330)*	4572 (10080)*	914 (36)	
300REOZJ Standard Fuel Tank								
No Tank	0	4121 (162.3)	1338 (52.7)	2153 (84.8)	2835 (6250)	2722 (6000)	260 (10)	89/75
2067 (546)	24/24			2731 (107.5)	3770 (8311)*	3656 (8061)*	838 (33)	
300REOZJ State Code Fuel Tank †								
2101 (555)	24/25	5009 (197.2)	1338 (52.7)	2894 (113.9)	4076 (8987)*	3963 (8737)*	635 (25)	89/75
4065(1074)	48/48	5588 (220.0)		3173 (124.9)	4644 (10238)*	4530 (9988)*	914 (36)	

Note: Data in table is for reference only, refer to the respective ADV drawings for details.

* Max. weight includes the generator set (wet) using the largest alternator option, enclosure with acoustic insulation added, silencer, and tank (no fuel).

† State code fuel tank specifications (height and weight) include I-beam option.

‡ Log average sound pressure level of 8 measured positions around the perimeter of the unit at a distance of 7 m (23 ft). Refer to TIB-114 for details.